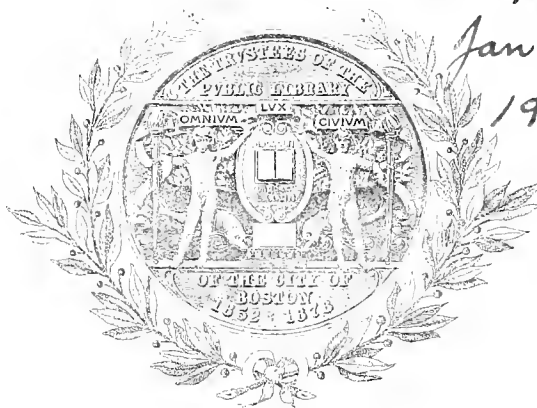




No 4012.383



16

Jan-June

1916









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OVERSEAS RIDERS' OPINIONS.

1D

# THE MOTOR CYCLE

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No. 667. Vol. 16.

Thursday, January 6th, 1916.

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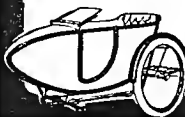
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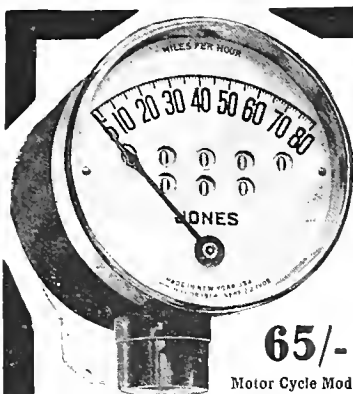
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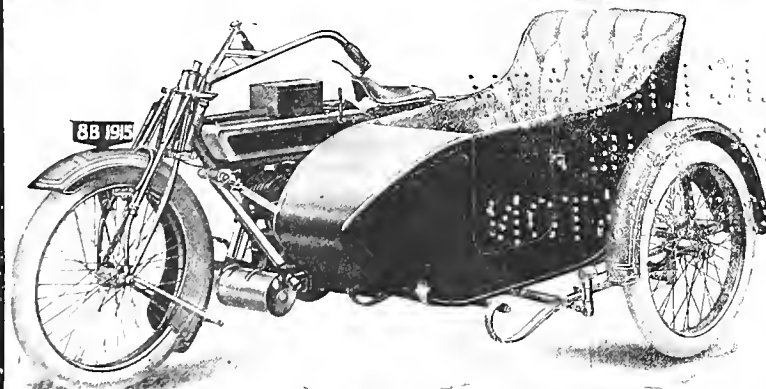


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ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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Telegrams: "Cyclist, Fleet, London."  
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**Editorial Offices:**  
Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
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**Northern Offices:**  
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Telegrams: "Hiffe, Manchester."  
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## Looking Back.

**E**VERY industry has received its test of strength during the war period, the motor cycle trade being no exception. Therefore a review of the conditions existing in the motor cycle world since the commencement of war is interesting at this juncture. Mistakes and blunders there have been in plenty, hence our reason for a recital of the trials and vicissitudes through which the trade has passed during the last eighteen months. At the outbreak of war we recollect that firms, seized with the panic which, perhaps, naturally pervaded the atmosphere at that time, commenced cancelling contracts in the expectancy of bad times, and, moreover, cut down staffs and encouraged many of their best engineers to join the Forces. It is common knowledge what the resultant effect of all this chaos was in a country unprepared for war on land, and it will be profitable to some to consider how the trade subsequently extricated itself from this difficult position.

A month after war had been in progress, when the cry was "Carry on," we felt it our duty to urge manufacturers to consider the advisability of continuing to build motor cycles in reasonable quantities with a view to taking them into stock, reminding manufacturers that the trade had not for many years past been in the advantageous position compared with foreign rivals of being able to give delivery without some weeks delay. Some heeded our advice, and profited greatly as a result when the Russian Government a month or two later came along and purchased practically all the motor cycles it could lay its hands on. In any case, our Overseas markets would gladly have snapped up any surplus stock, had it been available. Other firms cut down their contracts for raw material to fine limits and continued in a very small way until the trade, gradually deprived of machine tools and a great number of workmen, found itself quite unable to cope with the sudden demand in the spring. At this point frantic efforts were made by manufacturers to

obtain the stocks of raw material which a month or two previously they had refused to accept, but the efforts were largely in vain, as raw material suppliers, too, had been disorganised by the cancellations and had allowed their skilled men to join the Colours. Hence an all-round jump in prices. To turn away for the moment from the business side to the most regrettable side of the matter, during those early months of the war motor manufacturers were not encouraged by the Government—indeed, they were in many cases discouraged—in their offers to utilise their plant for the manufacture of the very necessary munitions of war, the lack of which at a later date was to prove a real hindrance to the success of our arms. Whilst Government orders were being sought in vain, manufacturers were unable to take advantage of the brisk demand which had sprung up by reason of gold circulating freely, they themselves having been hampered by their injudicious action in cancelling contracts at the very outbreak of war, the supply of raw material as a consequence having been thoroughly upset, and those supplies which were available commandeered by the Government.

## The Absence of a Leader.

It is a disheartening tale of lost opportunities, we admit, all due to the absence of a "leader." Motor firms being unsuccessful in their efforts to obtain regular orders, were obliged gradually to release men who had formed the backbone of their business, yet we find in *The Motor Cycle* of November 12th, 1914, a leaderette pointing out what a national asset the motor trade could prove. The heading to this article was "Bred in Peace, but Invaluable in War," and it was urged that the motor trade, being one of the most advanced in mechanical engineering, employing a highly-trained and specialised body of mechanics, could prove of inestimable value to the Government in special engineering work (obviously shells and aeroplane parts were referred to). But the Government were by no means alive to this position, and it was not until

**Looking Back.—**

many valuable months had been wasted, and when the exodus of skilled workmen had reached alarming proportions, that the Government came to the same conclusion that we had arrived at six months previously.

Again, in scoffing at the Board of Trade's insistent appeals to "capture enemy trade" when firms could not get raw material enough to satisfy home demands, and were, moreover, being abused for not making munitions, and their skilled men urged to enlist, *The Motor Cycle* said:

"It seems too much to hope that the Government are in a position to co-ordinate all the industries which can be pressed into their service in the supply of munitions of war, but those firms not so employed should certainly know at once whether or not they are right in treating seriously the suggestions of the Board of Trade. The matter is more serious than it seems at first sight. Enough has not been made of the present indefinite and unsatisfactory state of affairs. Why? Because manufacturers, who one by one have been taken off their ordinary work and diverted on to Government work, have made no complaint."

The remainder of the tale is common knowledge. Skilled men have had to be fetched back from the trenches after months wasted in training, and the Minister of Munitions himself asserts that we have still to catch up with our requirements in the matter of munitions.

### The Pay of Army Motor Cyclists and Car Drivers.

**N**ATURALLY enough, there has been a great deal of ill-feeling concerning the divergent rates of pay of men in His Majesty's Forces. For instance, men in the trenches wielding the bayonet receive a 1s. or so a day, whilst car drivers, who have comparatively comfortable jobs, are paid as much as 6s. per day. In the Motor Machine

Gun Service, whereas the motor cyclists get 1s. 2½d. per day, the car drivers working alongside the motor cyclists get five times as much. Motor cyclists employed as despatch riders get 2s. 6d. and 3s. per day. Last spring we drew attention to these anomalies, and urged a standard rate of pay of 3s. per day for car drivers and motor cyclists, for which we received many appreciative letters from readers on active service. Subsequently Mr. W. F. Perkins, the member for the New Forest Division of Hampshire, took up the question, we had raised, in Parliament, but Mr. H. Baker, who replied, defended the position. However, it was clear that this unsatisfactory state of affairs could not continue for long. In the interim another few million pounds have been paid out, and an important announcement is now forthcoming to the effect that the 6s. per day rate will not be paid in future to car drivers. The statement was contained in the Paymaster-General's answer to a question in the House of Lords last week:

"Lord Newton (Paymaster-General) informed Lord Haversham, with reference to the six shillings a day paid to some of our drivers of military motor lorries in France, while other drivers are receiving only fourteen pence per day, that men receiving the higher rate could not be replaced by others obtaining the lower rate, because time did not permit recruits to gain sufficient experience to take entire charge of motor vehicles. There were already large numbers of drivers at fourteen pence a day, but the number of men now being trained was barely enough to meet the increased needs of the Army. No more men would, however, be taken on at the higher pay."

As is well known, recruiting for car drivers for the A.S.C. has been closed for some time, but men of military age physically unfit for the combatant sections, and men between 40 and 45 years of age are now being accepted as learner-drivers at 1s. 2d. per day, this rate of pay being doubled on the learner becoming proficient.



**AUTO-WHEELING IN HOLLAND.**

A snapshot taken during a competition for Auto-wheel users held at Arnhem. The competitor shown—a nurse—had been using her attachment for nearly a couple of years.



## OCCASIONAL



## COMMENTS

By "IXION"

Sydney R. Jones

**Springing.**

Some firms imagine they have solved the springing problem when they fit their front forks with coiled springs capable of perhaps 2in. of compression. Far be it from me to say a word against these and similar devices as temporary makeshifts. They are streets ahead of the old rigid fork, and we owe it to such elasticity as they possess, to their cheapness, and to their simplicity that motor cycling has been possible. But it is folly to dream that they solve the problem. Last week I was out on a certain light car which has three-quarter elliptic springs astern with 8in. of vertical clearance at their centres. These springs flattened out absolutely flat on several occasions during a long run over roads which have lain unrepaired since August, 1914, and have borne considerable artillery and lorry traffic in the interim. I daresay it takes a very bad road indeed to deflect a motor cycle wheel 8in. in the vertical line, but it is probable that we require springs with at least 5in. of motion; and it is questionable whether there is a fork of the coiled spring type in existence which affords more than 2in. If our needs are as indicated, what price the Overseas rider?

**Flywheel Dynamo Drive.**

I notice more in sorrow than in anger that several electrical firms are marketing lighting dynamos driven by friction off the tyre or wheel rim. I quite accept the situation. The demand for motor cycle dynamos is still small, and anybody who wants to earn the cost of his blue prints in the early stages of a new industry must market a device adaptable to all machines. Still, it is obvious that the tyre drive will require very heavy pressure, and as for the rim drive, I should be vastly surprised to hear that any motor cycle rim remains even approximately true after 5,000 miles of work. I know I am a bit of a "highway incinerator," to quote the latest Yankee slang for a speed merchant, and I usually spend an hour or two banging kinks out of my rims after a summer on the road. So a word to the No. 8 size hats who design dynamos—a word in all humility, since the intricacies of their circuits show that they are plainly men of brain and intellect. Please remember that an increasing number of us are using machines with outside flywheels. Here is a true, always dry, never oily, and very suitably located rotary member of many thousand motor cycles, off which your little rubber dynamo friction wheels could get a far, far better drive than they have ever done. This particular type of dynamo is very compact, and would lie snugly along the intermediate frame tube, under the tank. The Douglas market alone is well worth tapping with a notion on these lines; and the baby two-stroke is simply whimpering for it; so please weigh in with a few samples.

**Dry Battery Lighting.**

My promised report of the dry battery lighting system is deferred *sine die*, for the miserable tin cases supplied by the vendors for holding their treble accursed batteries have all opened automatically at speed on the road and deposited the half-exhausted cells somewhere between Nottingham and Coventry. Moreover, the unconscious loss doomed me to an uncomfortable night at a malodorous and fleasome roadside hostelry, near which my loss was first discovered as the gloaming drew in. Fortunately, I am of a forgiving disposition, and have purchased a couple of new batteries, which are now securely strapped into the aforesaid tin receptacles. The warning may save others from similar losses. I doubt whether the designers of these sets, so attractive in theory, genuinely realise the nature of the stresses to which motor cycle fitments are subjected, even on a baby two-stroke. The wiring is not sufficiently substantial; the lamp details are scarcely heavy enough; the battery box clips need an extra nut apiece, plus burring over with a file, hammer, or hacksaw; and so forth. However, I have often suffered gladly as martyr in a noble cause; and I will face further mishaps in the hope my reports may enable the various vendors to turn out a really roadworthy set in the near future.

**A Rum Start.**

The other day I was nicely caught out by a very cold day, which I struck in thinish attire with a baby two-stroke beneath me. I rather plume myself on lightning diagnoses, but my brain was numb with frost, and quite a time elapsed before I realised what was amiss. The machine would start from stone cold as easily as Charlie Collier's tuned racer when readied for a world's standing mile record; but when it was warm it could hardly be induced to start at any price. To my snug readers in armchairs, their cerebral tissues nicely warmed by Christmas toddy, the solution will, of course, appear instantaneously. The carburetter was flooding slightly. Thus a very rich mixture was available for the cold start; but as the air supply warmed up, the proportion of petrol became excessive and starting was difficult. There is this to be said in my defence, that a four-stroke would behave slightly differently, and I had never previously struck this particular trouble on a two-stroke. Under similar conditions, a four-stroke would not start properly from cold, but would thump very heavily and refuse to get away, probably stopping as soon as the load was thrown on the engine. But a two-stroke asks for a very rich mixture for a cold start, so it would get away nicely from cold. I do not think there is any other conceivable diagnosis.



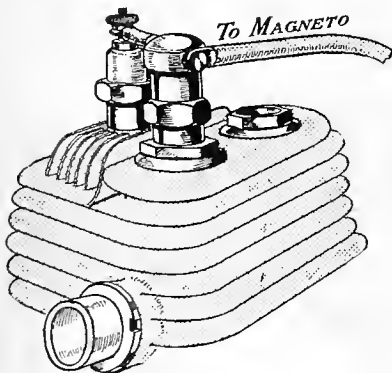
**I**N the past we have had articles championing various types of machines as the best general utility machine. This article is an attempt to take up the cudgels on behalf of the  $3\frac{1}{2}$  h.p. T.T. single. My justification is a mileage of 20,000 miles contributed to by three machines all of this type. All my three machines have been Nortons, and all have given excellent service.

A brief specification of the three machines may be of interest. No. 1 was a 1911  $3\frac{1}{2}$  h.p.  $82 \times 94$  bought second-hand from a Lancashire firm. It had a long wheelbase (56in.) and single gear. This length of wheelbase gave very comfortable riding on bad roads, very fine steering, and a confidence inspiring stability on greasy roads.

I fitted a Binks three-jet carburetter to this machine and got a very good mileage per gallon and wonderful flexibility.

I used Norton No. 1 principally in central Scotland and also spent a holiday in the Isle of Man on it during the 1914 T.T. week. I was very pleased with its performance on the climb from Ramsey and the Bungalow on the classic course on the one occasion on which I rode up there. The only trouble I experienced was the belt rim coming adrift on three occasions. This belt rim was held to the rim by a number of short spokes placed between the wheel spokes. This feature has been altered on later models.

Norton No. 2 was a 1914  $3\frac{1}{2}$  h.p. T.T.  $79 \times 100$  mm., bought in June, 1914. It also had a 56in. wheel-



Double ignition system showing single point plug in cylinder head.

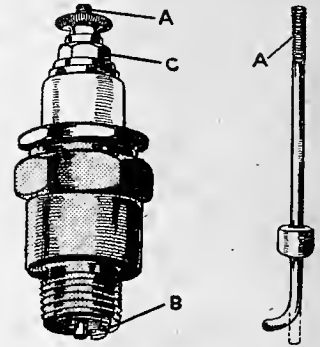
base, like its predecessor, and to this feature I attribute its marked road-worthiness. I used a three-jet Binks carburetter and got great satisfaction from it. My only objections to this instrument are, firstly, I found it tiring to manipulate the long stiff levers over a long run, and,

secondly, I was troubled with wire breakages. I hope Mr. Binks will pardon this criticism of his otherwise excellent instrument.

A Philipson governor pulley was the only gear used, and with its aid the machine climbed some alleged roads in Glamorganshire and Breconshire, where no motor cycle had ever been before.

## Firing at Two Points.

I experimented for some time with double ignition, using for the purpose a Lodge double-pole plug over the inlet valve and a single-point Bosch in the centre of the cylinder head. With this fitting I found starting was very easy. One pull of the back wheel with the machine on the stand would start the engine from cold at any time if care were taken that the pull was sharp during the induction stroke. Power on hills was increased for a given throttle opening, but, unless carefully driven, knocking occurred readily.



Small point at side filed off, and central electrode bent over, making a single point plug.

Driven all out, pre-ignition became noticeable after half a milé. This I traced to the rather thin points of the double pole plug becoming incandescent. This machine was used for my work as a medical practitioner in a hilly district in South Wales. The frequent stops necessitated by my work, the steep narrow tracks, and rough surfaces encountered, made severe demands respectively on the easy starting, hill-climbing, and roadworthy abilities of my machine. In addition, the excellent spring-up stand beloved of "Ixion" was, perhaps, the finest possible fitment for a doctor's mount.

Norton No. 3 was a 1915 Brooklands Road Special; a  $79 \times 100$  mm., 490 c.c.,  $3\frac{1}{2}$  h.p. engine fitted in a 54in. frame, with a dropped top tube instead of the straight one previously favoured by Mr. Norton.

I have tried various carburetters on it, and at present it is fitted with a Senspray.

A variable pulley gear fitted gave good service, but being severe on the average rubber belt, I substituted for it a Philipson pulley and fitted up a handle-bar control. This gave a very fine variable gear, and I have yet to find the ordinary road hill that I cannot climb. Belt wear has been slight. Harcourt radiators were fitted to this engine early this spring as an experiment, and I have been very well pleased with the result. The Norton engine is always a very cool-running one, and Harcourts, to my mind, render it the equivalent of a water-cooled engine. The most noticeable feature was the liquid state of the oil on the cylinder wall, piston, and rings, and on the valve stems. On taking out such a normally hot-working item as an exhaust valve I always found the stem covered with a film of oil (and graphite from the Oildag). Apparently the radiators keep the cylinder temperature low enough

**Some Fads and Fancies.—**

for the oil to remain liquid: to my mind a very desirable state of affairs in an internal combustion engine.

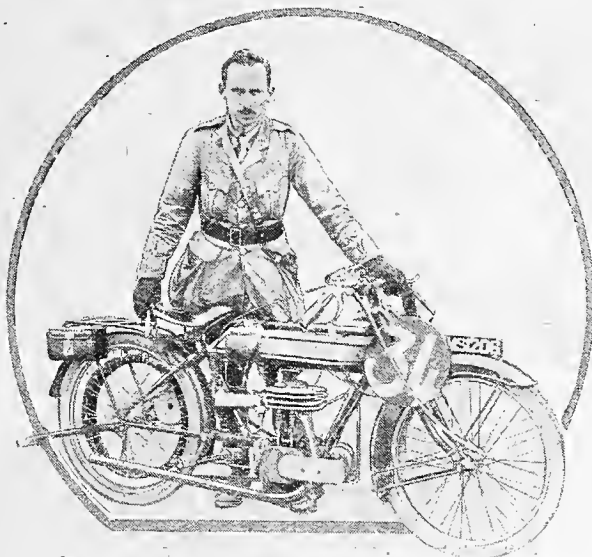
I mentioned Oildag. I have great faith in this "nostrum" ("Ixion" again), and I use it consistently. I have found it particularly valuable in the lubrication of valve stems and guides, and on the inlet valve stem it also helps to prevent air leaks.

**The Simplicity of the 3½ h.p.**

All these three machines have been of the same type, and have been used as general utility machines. Medical practice, holiday runs, and a little competition work have all been mixed up. As machines go, their simplicity nearly equals that of the average two-stroke one meets, and the 3½ h.p. single needs the minimum of attention. My machines have been indulged with various fads and fancies at different times, of which the foregoing two examples, Harcourts and Oildag, have been singularly successful.

A single point plug is a *sine qua non* for this type of engine. It ensures an easy start and freedom from overheating and pre-ignition troubles.

Some of your readers may not know that the 2s. 6d. Sphinx plug can be converted into a very fine racing plug. Detach the central electrode A A. Remove the small point B by filing it off. Carefully bend the point of the electrode A A and replace. Adjust the gap between the central electrode and the body of plug, and lock in position by nut C. Then one has a good single-point plug that will stand up to anything.



Capt. A. Lindsay, M.B., the writer of the article "Some Fads and Fancies." Capt. Lindsay rides a Norton, and competed successfully at the All-khaki Brooklands meeting last August.

**Free Lubrication Advisable.**

The type of machine represented by any of these three is, to my mind, the best all-round mount. At one o'clock I can have a flexible, decorous machine for doing my work, and by three o'clock the same afternoon I can be enjoying the sport of an amateur hill-climb with the same machine, minus a few of the fittings that one adds for comfort and luxury.

Running costs are probably as low as any other type of machine on the market.

Petrol runs me at least 100 miles per gallon. Lubricating oil I use rather heavily—one pumpful every three or four miles average running. In addition, I use one half pint of lubricating oil to every gallon of petrol in my tank. Coolie and Price's Huile de Luxe have been very satisfactory.

Summing up all these facts, I pin my faith to the following specification: A 3½ h.p. long stroke high efficiency single engine, Harcourt radiators, semi-automatic two-lever carburetter, single-point plug, h.b.c.

Philipson pulley fitted in a long wheelbase frame: a pronounced rake on the steering head is essential for good steering. Easily detachable wheels, good mudguards, moderate T.T. bars, T.T. footrests, and knee grips complete the machine that conforms to my ideals. I should like to add a tribute to the excellence of Mr. Norton's production. I have not experienced a single mechanical breakage, barring control wires and the belt rim spokes in machine No. 1, and I have never failed to get home under my own power.

A. LINDSAY, M.B.

## Motor Cyclists Controlling Bodies Overseas.

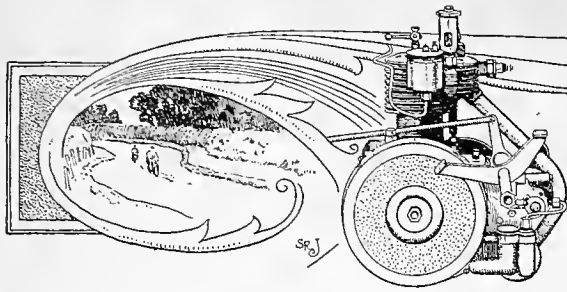
### Some of the Difficulties to be faced in Australia.

**W**E have received a letter from a prominent member of the executive committee of the Auto-Cycle Association of New South Wales, referring to a paragraph which appeared in *The Motor Cycle* of September 2nd last, in which it was stated that Australia had no ruling body to look after the pastime for motor cyclists, as is the case in other Overseas Dominions. He points out that the A.C.A. of New South Wales is the sole governing body of motor cycling, and also mentions that the sport is controlled in Victoria by the Victorian Motor Cycle Club. His letter, however, does not in any way prove that our original paragraph was incorrect, and it is still a fact that there is no governing body of motor cyclists for Australia, each State apparently having its own. It is up to associations like the A.C.A. of New South

Wales, therefore, as well as the Victorian Motor Cycle Club, to see if it is possible to form such a body.

We recognise that such a course is full of difficulties, owing mainly to the huge size of the Australian Continent. Conditions are often totally different in the various States, and Perth, the capital of Western Australia, is roughly as long a journey (for the trip must be made by sea) from Sydney, N.S.W., as we at home are from New York. This is a point English people often overlook in discussing Colonial matters. Then, again, the amount of inter-State jealousy, in particular between Victoria and N.S.W., would prove very troublesome.

We are in receipt of the rules and constitution of the A.C.A. of New South Wales, which seem to be drawn up on a thoroughly sound basis.



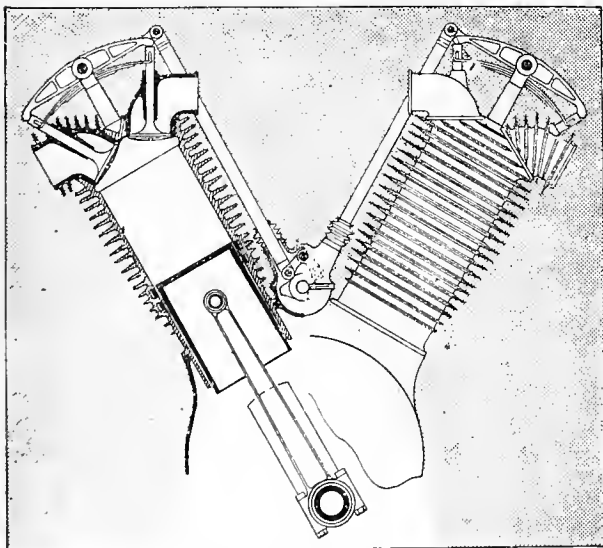
## Aluminium Cylinders.

An Interesting Method of Constructing  
a Very Light Engine.

**A**N engine having aluminium cylinders has been invented and protected by Mr. G. Funck, of Coventry, the object being to produce an extremely light engine having high cooling efficiency, and capable of being produced at a low cost in large quantities. This is attained by introducing an aluminium alloy cylinder without any liner, and in order to reduce the wear of the cylinder walls, due to the scraping action of the usual piston rings, it is proposed to put special contractile rings in the cylinder walls and make the piston in the form of a light steel shell of such a length that it never uncovers the rings. (Fig. 1.) As the piston usually gets much hotter than the walls, and as the coefficient of expansion of the materials used is just in inverse proportion to the heat they have to sustain, it will be seen that the greater clearance necessary for the ordinary aluminium piston in steel or cast iron cylinders is not required.

### Contractile Rings.

These contractile rings in the cylinder walls are claimed to have the following advantage. Instead of keeping the split of the rings slightly open, they will be manufactured so that they just make a perfect sliding fit on the piston when the split of the rings is closed, and will thus make a perfectly tight packing. Any further wear is impossible, and the friction is reduced to the minimum. It is also proposed to fit



The Funck design for an air-cooled aluminium cylinder having two contractile rings in its barrel. The piston is of thin steel and without any rings whatever. The valves are carried in detachable cages of cast iron.

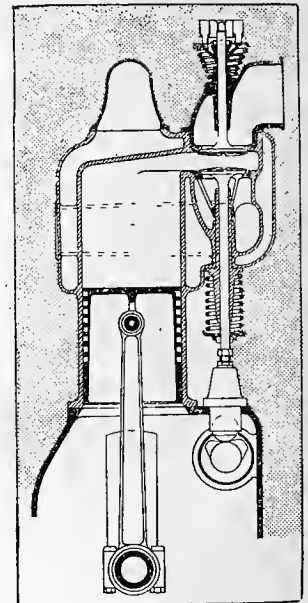
aluminium alloy pistons in connection with these particular rings, as no scraping of the rings is to be feared.

Another proposition is to use in water-cooled engines a plain aluminium cylinder without rings. The piston in this case would be provided with grooves to act on the principle of the labyrinth packing as used extensively on steam turbines. (Fig. 2.)

As the heat conductivity of the aluminium alloy is, roughly, three times that of cast iron or steel, the aluminium cylinders should be specially suitable for air-cooled engines with the radiating fins cast on the cylinder, and if necessary machined all over.

After considering the following facts it will be seen there is no fear of these cylinders cracking. The expansion of the aluminium is, roughly, three times that of cast iron, but the heat conductivity as well is, roughly, three times that of cast iron; as a natural consequence, there is no greater danger of local heat pockets causing the cylinder to crack than with cast iron cylinders, as the material strength is about the same in both cases.

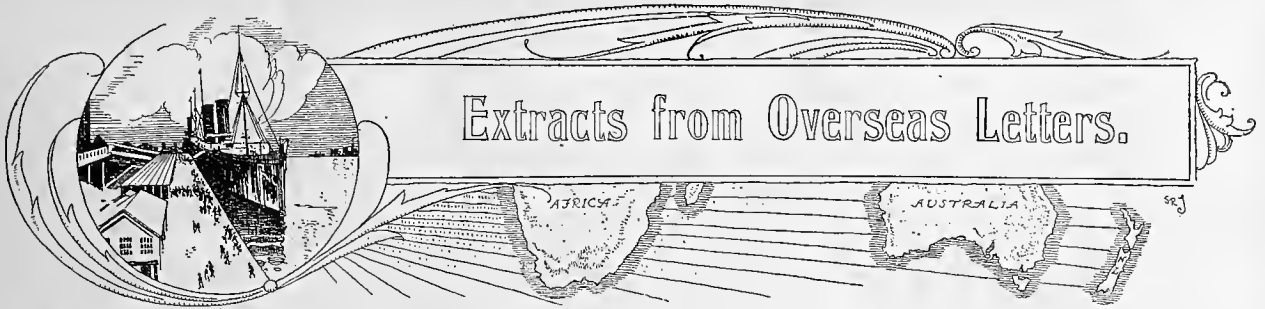
The valves in either case would be suitably arranged in special pockets and let into the cylinders, as is often the practice with existing cylinders. As to the wearing qualities, there is nothing abnormal to be feared. The aluminium pistons now in use with the steel or cast iron cylinders show very good wearing qualities.



An adaptation of the labyrinth packing used in steam turbines, a series of grooves being turned on the outside of a light steel piston, which is carried in a water-cooled aluminium cylinder barrel.

Unless there is more heavy rain before this issue of *The Motor Cycle* appears, the roads which have been temporarily rendered impassable by the rain and wind storm of last week will be free, but care may still be required on the following roads: Exeter-Honiton road, Windsor Road, and Chertsey Lane. Also the Brighton-Lewes road has given way owing to floods.





**I**N giving extracts from a few of the many letters we regularly receive from our Overseas readers, it will be noticed that, even after the exhaustive tests and trials which motor cycles have undergone during the past few years, they require not a few alterations even now to come up to the ideals of many of the harder riders situated in some of the out of the way parts of the world. Such items as spring frames, stronger wheels, larger tyres, greater tool bag accommodation, etc., are a few of the things hinted at.

There is little doubt but that British motor cycles are at the present moment still quite the most generally used machines in the Overseas Dominions. This is undoubtedly due to the superior finish and lasting qualities always associated with British products, but it does not take a person of any great perception to notice in even the few extracts quoted here that a hindrance to the more rapid extension of British products is the casual way in which many British manufacturers transact their business in these far-off parts of the Empire. It would appear that the American manufacturers with their tempting prices, and also their depots with all facilities for the rapid supply of spares, are beginning to attract the attention of even some of the most patriotic riders.

Do we see in these opinions the commencement of a waning of the popularity of British-made motor cycles in the Overseas Dominions? We hope not.

In writing from Natal, South Africa, Mr. E. A. BEHRENS advocates "spring frames, high ground clearance, stronger rims, and greater tool-bag accommodation. Machines should be sold ready for the road, with all accessories.

#### **Wanted, Cheap, Light Machines.**

Mr. W. J. THOMPSON, of Sydney, Australia: "I should say there would be a good opening for a cheap solo machine, one that would sell at about £55 or £60 out here. What is wanted, in my opinion, is one of about 3 h.p. with chain drive, and not too heavy."

#### **The Ideal Machine suggested by a Reader in Portland, N.S.W.**

"At present I use a 1913 4 h.p. single, three-speed, belt-driven sidecar combination. This district is very hilly, and I often pine for more power, so as to be able to streak up the hills without changing gear so often. Belt drive I find very unsatisfactory, except on good roads and in fine weather. In sand, mud, and when crossing water splashes one longs for a chain-driver. Good clearance is very necessary. I measured a well-known make of machine recently, and the gear box was just 3½ in. from the ground, this being the only defect in an otherwise excellent mount. My ideal is a 6 or 8 h.p. twin, three-speed chain-driven machine, side-by-side valves, magneto placed high up behind the engine, and at least 6 in. ground clearance. Wheels should be detachable and interchangeable. Saddle and footrests should be sprung in unison, as I prefer the semi-rigid fixing to the ordinary spring frame for sidecar work. Less mudguarding is preferable—without valances to prevent mud, etc., collecting. The weight should not exceed 250 lb."

#### **The Price of Replacements.**

MR. T. S. WATSON, of Dudley, N.S. Wales: "I use my 3 h.p. Enfield constantly in my work, and find it invaluable. My chief grumble is the price charged for English motor cycles, parts, and accessories compared with American. Why is it, if the American manufacturers can sell their machines and parts at a reasonable price, that we cannot get English goods on like terms?"

#### **Unsuitable Mudguards.**

MR. D. S. JACK, a New Zealand reader, says: "The fittings for attachment of mudguards require to be much stronger. As a rule, after a few weeks' riding on a new machine, these fittings become very loose and noisy. A stout plate fitted on the under side of the guard overcomes this by distributing the stresses produced by the road shocks. Guards, as a rule, are not wide enough: Both front and back should be at least 4 in. wide. The front guard should have side shields at the bottom only, and these well spread, as on these loose surfaced roads, stones, etc., are liable to be picked up, and, if the guard is too close to the wheel, cannot get out, and jam the wheel."

#### **Undersized Tyres and Unsuitable Forks.**

MR. E. A. MACDONALD, Adelaide, after complaining of the difficulty of obtaining parts and accessories, and the prices charged for them, also the vexatious delays over repairs, etc., goes on to say: "I will not say that the finish of the English engine is lacking, neither is the efficiency questionable, but there are numbers of points which must be attended to if they desire to retain the lead on this market. Why will they slavishly stick to 26 in. x 2½ in. tyres? For this country we want nothing smaller than 28 in. x 3 in. I had a famous English machine, the general finish of which was a work of art, but the two points which spoiled it for use out here were the small tyres and the most unsatisfactory type of spring fork. The spring was continually breaking, so in the end, to avoid trouble, it became necessary to substitute a rubber buffer and a strap. There are numbers of this make to be seen here with the fork fixed rigid, and yet the makers still continue to supply this fork."

#### **A Carryable-sized Wife.**

"G.T.B." of Sydney: "It is a very big mistake for any machine to be sent out here unless it is fitted with a variable gear. There is no doubt that those who have the money out here are the working people, and, moreover, if the English manufacturers would see their way to put a machine on the market at a reasonable figure they would do a very large trade here. In England an ordinary working man cannot afford to run a motor cycle; out here he could, but the original cost is too great. Many fitters out here will not accept a job under £5 per week. It is chiefly the single men who go in for motor cycling, but there are exceptions. I took good care to go in for a carryable-sized wife! The English manufacturers seem afraid of the easy payment system, and so lose a great deal of the trade which goes to the foreigners, who encourage easy payments. Nearly everyone buys what he wants, and, in many cases, more than he wants, in this manner."

#### **Machines chiefly used for Business.**

"W.H.M." of Henty, New South Wales: "In my district there are few machines used solely for pleasure, owing greatly to the price charged out here, the majority being used simply for business. Petrol costs £1 for a case of eight gallons, while oil is 6s. per gallon."

### "The Motor Cycle" in the Desert.

From an African reader (Pietermaritzburg): "I lately returned from nine months' Active Service in German South-West Africa, and during the time I was there I received *The Motor Cycle* regularly. It was very much appreciated, and in great demand among motor cyclists, so that even in the midst of the desert we were well posted with the latest in the motor cycle world. Even a picture of a motor cycle was refreshing after months of plodding through the sand on horseback. It is almost impossible to get a new machine of a good make here since the war, and the prices demanded for those it is possible to get are outrageous. For a machine costing £75 before the war £90 is now demanded."

### Wanted, a Substantial Machine.

MR. G. HOBBS, Christchurch, New Zealand: "My idea of a machine suitable for Colonial riders would be as follows: 6-8 h.p. twin, very strong frame, sprung fore and aft, stronger wheels and spokes than usual, at least three speeds, countershaft gear, 5in. tyres. Everything should be as strong and plain as possible, and, above all, very little plating; finished grey or khaki. There are about 8,000 motor cycles in and around Christchurch. Most riders own sidecars, but very few use them continually. The motor cycle races held on the beach at New Brighton, about five miles from the town, attract very large crowds."

### Troublesome Licence Regulations.

MR. R. J. YOUNG, of Sydney, Australia, says: "I have had three machines since being out here, and all were purchased second-hand at home, and after being ridden six months I have always been able to sell them here at a profit. My first—a Rudge-Multi, which is sold here for £84 new—I sold for £70. To obtain a driving licence, or even to have it renewed, it is necessary to apply personally at the Traffic Office in Sydney with your machine, always in working hours between 11 a.m. and 3 p.m."

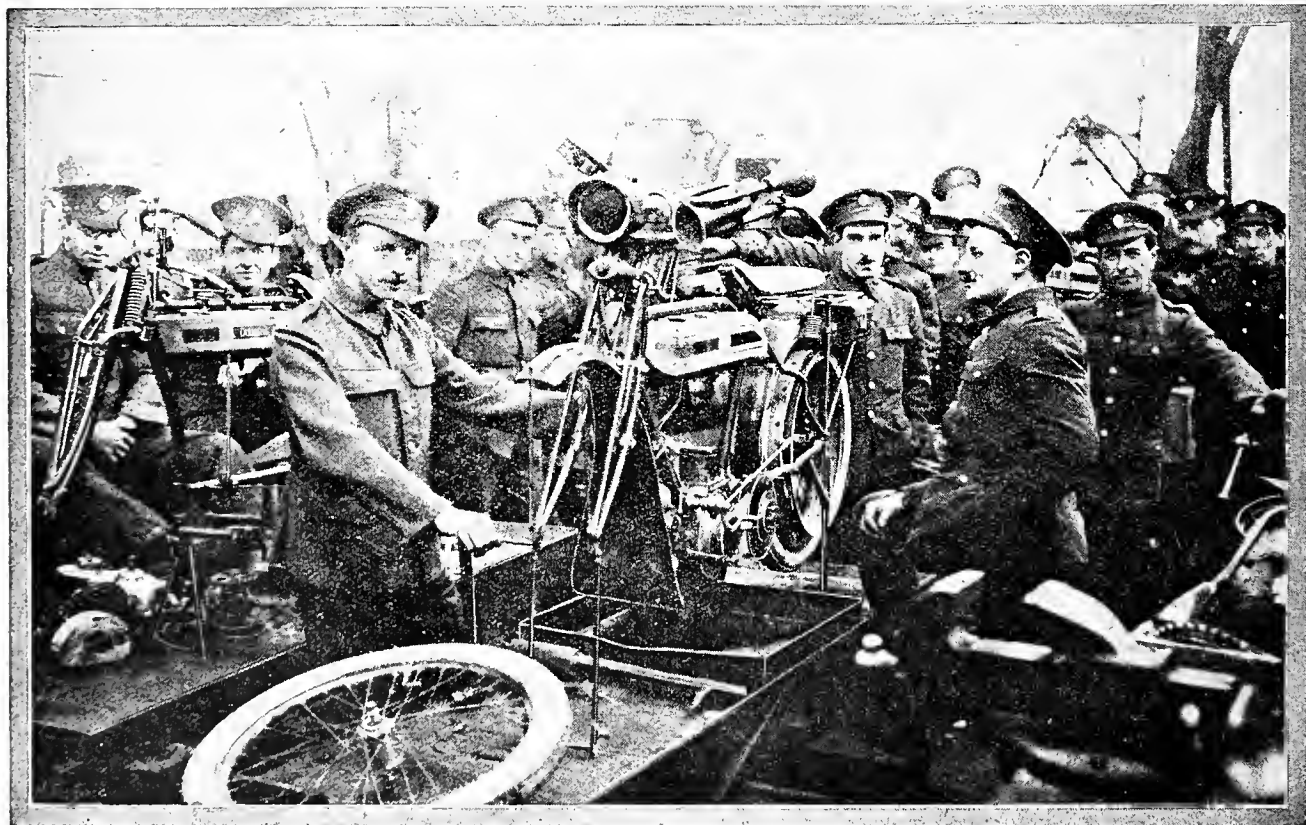
Recently I lost my number plate, which is white enamel with black figures, size 9in. x 4in. I wrote to the Traffic Department, enclosing 2s., the cost of a new one, and asking for it to be sent in time for use at the week-end. I received a reply telling me I must take my machine in and have it inspected and re-registered. I was unable to get in during the week, and as I specially wanted to use the machine over the week-end I cut a piece of tin the same size, painted it white, and put the number on in black, exactly the same as on my lost plate; but it was of no use, I was fined 11s. 6d. and my licence endorsed, although my old number plate had been found and handed in at the Traffic Office, where it had been all the time."

### Danger of American Competition.

MR. HAROLD D. YATES, of Sydney, N.S.W., writes: "Prices of machines here are, I consider, too high, Triumphs, Ridges, etc., costing anything from £70 to £80 and upwards, according to fittings. The American motor car is almost obtaining a monopoly of this market, and I fear that the American motor cycle will in this crisis go a long way towards the same objective. The Indian and American Excelsior are seen in increasing numbers. The Americans are now turning out some very fine cars and cycles at moderate prices. Personally, I should prefer that we should obtain them from within the Empire if possible."

### Insufficient Clearance.

MR. R. J. WOODCROFT, of Bunyan P.O., Coomar Line, N.S.W., writes: "With regard to retail prices here there seems to me to be an enormous profit made on the motor cycles sold in New South Wales. For instance, I am riding a 3½ h.p. Abingdon 1908 T.T. model, and am told that this machine costs about £50 in England. Out here it costs £78. A drawback to the use out here of a great many of the machines advertised in *The Motor Cycle* is the very low road clearance, which often causes trouble in the country districts. The footboards are also too low."



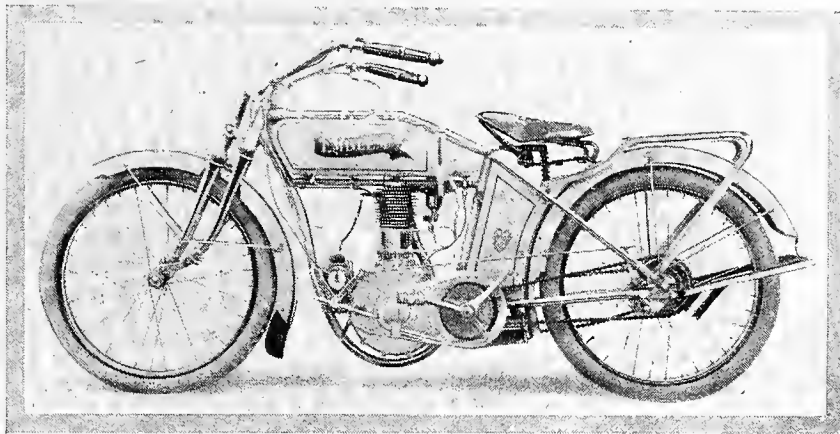
SCENE IN A MILITARY MOTOR CYCLE HOSPITAL.

With such a vast number of machines in service under most gruelling conditions, there is always plenty of work for the army of mechanics stationed at the different A.S.C. repair bases at home and abroad.

## ANOTHER AMERICAN ARRIVAL.

Emblem 7 h.p. Single-cylinder and 10 h.p. Twin-cylinder Models.

**A** NEW comer to this country from the United States is the 7 h.p. Emblem motor bicycle, which is one of the largest single-cylinders on the road, the bore and stroke being  $89 \times 101$  mm. = 628 c.c. It is handled by the Emblem Motor Cycle Co., 895, Fulham Road, S.W. The engine is conspicuous for the size of its flywheels, which are well designed and constructed so that



The 7 h.p. single-cylinder Emblem. Note the typically American loop frame.

cover is circular in shape, and is screwed on to the aluminium; a large nut being cut in the centre and forming part and parcel of the cover, renders its removal a simple matter.

The magneto, which is the well-known C.A.V. Ruthardt, is carried in front of the engine, and is driven by means of gearing. The exterior of the crank case is well finished, and as it has but few projections there should be no difficulty about keeping it clean. The lubrication is effected by means of a gravity drip feed from the rear of the tank, while extra oil can be given by a pump.

The carburettor is the popular Schebler, which is controlled by means of the right twist handle, the left twist handle serving to actuate the multiple-disc clutch. At the present moment the ignition advance is controlled by a lever situated at the side of the tank, but in future models we understand the spark will be controlled from the handle-bar. A separate exhaust lever is fitted on the right-hand side of the handle-bars.

The frame is constructed of triangularly reinforced tubes of great strength. The top tube is dropped at the rear, and the head has been specially strengthened.

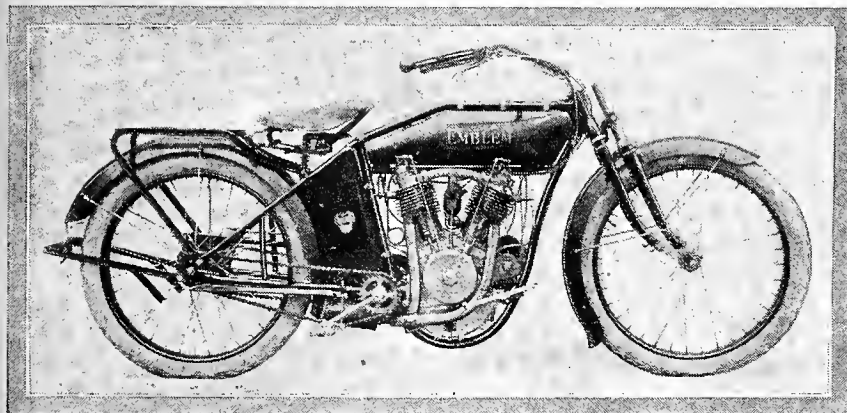
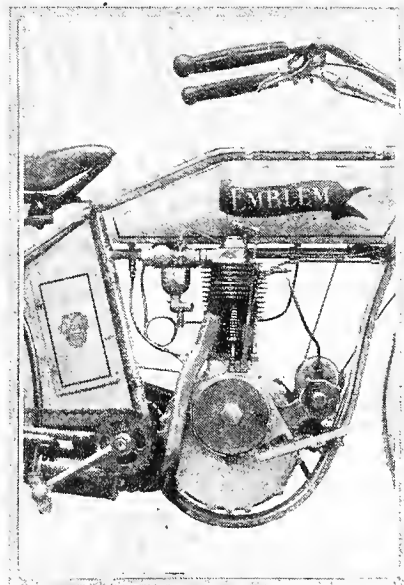
Quite an attractive feature is the luggage carrier, the major portion of which is constructed of U section channel steel, the grid portion being formed of steel rods passed through the carrier frame, while the stand is of similar material and specially substantial.

Both front and rear mudguards are provided with side valances. The transmission throughout is by chain, the front chain being fitted with a cover. All the Emblems in England at the present time

Power unit of the 10 h.p. twin Emblem, showing drive by chain to countershaft

the principal weight is on the periphery, all unnecessary metal being cut away from the space between the periphery and the centre. The connecting rod is a steel forging fitted with a special "non-grain" bronze bearing at the big end.

As is commonly found on American motor cycles, the inlet valve is of the overhead type. A conspicuous feature is the cover of the timing gear case. This

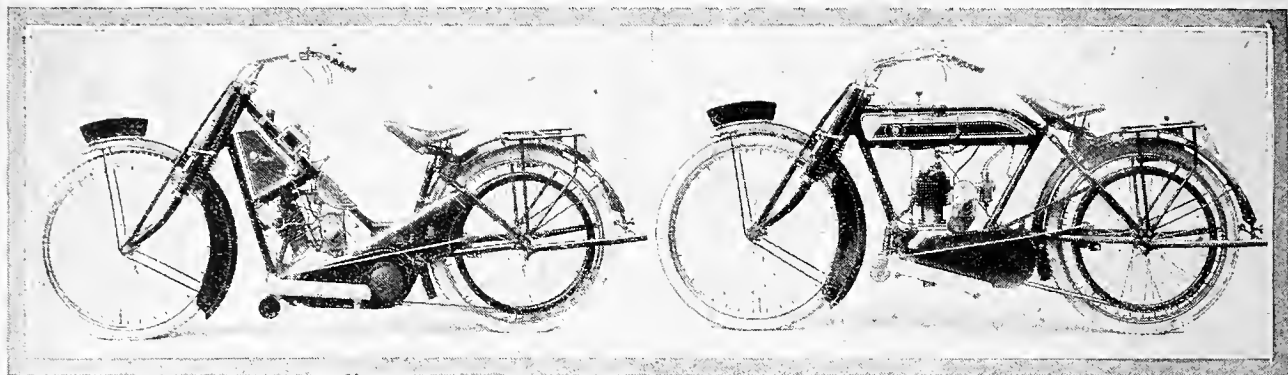
Valve side of the big 10 h.p. twin-cylinder Emblem, the latest American arrival The cylinder dimensions are  $89 \times 101$  mm. = 1,256 c.c.

Valve side of the power unit of the single-cylinder 7 h.p. Emblem.

are single-gear clutch models, but the next batch will be provided with three-speed gear boxes in the usual countershaft position. The spring forks are well designed, the coil springs being entirely enclosed, and grease cups provided to the principal moving parts.

All models can be had fitted with the Remy electric lighting system.

# O.K. Lightweight Motor Cycles.



(Left) Ladies' model O.K. Junior, showing arrangement of dress-shields and mudguards. (Right) The standard 2½ h.p. O.K. four-stroke lightweight. A countershaft drive and a two-speed gear are adopted on both the machines illustrated.

**T**HE O.K. lightweights for this year will consist of four models. O.K. Junior, Mark IV., is fitted with a four-stroke engine, having a bore and stroke of 70 × 76 mm. (292 c.c.), side-by-side valves, and adjustable tappets. The bearings are of large dimensions, cast under pressure from a phosphor-bronze alloy, and the valves are turned from the solid bar. A two-speed gear is fitted, having a gate change and the gears always in mesh; the lubrication of the gear box is by means of a large lubricator, which feeds through a hollow stud in the top of the gear box. The transmission is by chain to the gear box, thence by belt (¾ in.).

The frame is constructed throughout of carbon steel tubes, having a one-piece

head with hardened steel ball races and a bed for the gear box cast in one piece, giving absolute rigidity and easy adjustment; the wheelbase is 51 in. and the height of saddle from the ground 30 in. The tank has a capacity of one gallon of petrol and one quart of oil, large fillers standing well

Gate change on the two-speed O.K., showing gear lever in neutral position

above the tank, and a Best and Lloyd automatic drip-feed lubricator. The handle-bars can be semi-racing or roadster. Other fittings include Amac carburetter, E.I.C. magneto, controlled by lever on the tank, Druid pattern forks, Clincher de luxe tyres, 26 × 2 in., aluminium footplates, and ample mudguards.

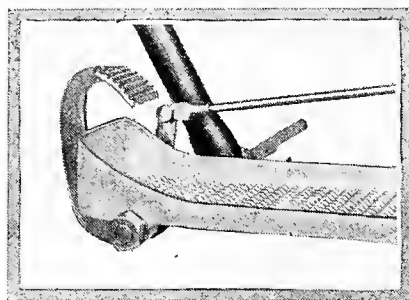
The rear foot brake is so placed that it can be operated by the toe without lifting the heel from the footplate—a desirable feature—and the machine is nicely finished in black enamel with a dark olive-green tank. The weight is about 135 lb., and the price £38.

Mark V. is in many respects similar to the model just described; it is, however, fitted with a two-stroke engine, in which, we are assured, great attention has been paid to balance—a matter in

and Moseley tyres, 26 × 2 in., are standard.

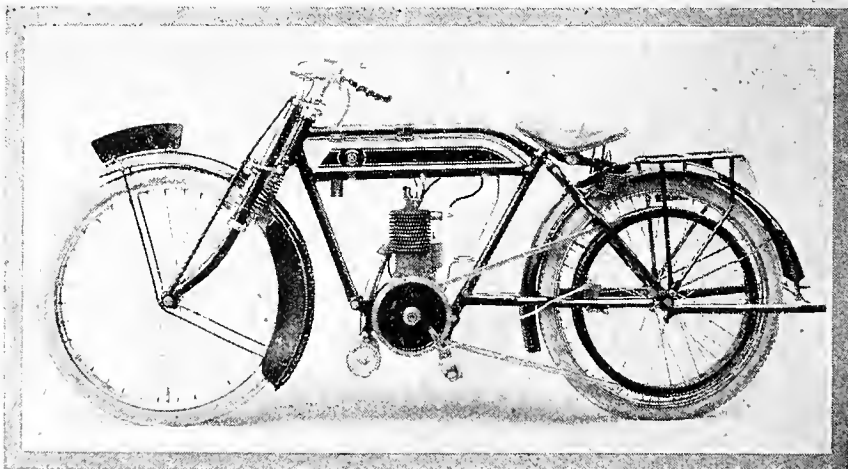
Mark VI. has a 250 c.c. engine (64 × 77 mm.), which is guaranteed to give at least 2½ h.p. on the brake.

Mark III. is the lady's model. The engine is rated at 2 h.p., the bore and stroke being 58 × 72 mm. (190 c.c.) The piston has two rings; the flywheels are heavy and well balanced. Large bearing surfaces of best quality are employed throughout. The bolting down nuts are so placed as to facilitate the removal of the cylinder, and the inlet valve is placed overhead. The frame is constructed to give the greatest possible dress clearance, the upper tube being but little higher than is the case in a lady's pedal cycle. The two-speed gear box and other fittings are similar to those already described under Mark IV. The front brake is controlled by Bowden wire, the rear brake by the foot. This machine, like all the O.K. models, is fitted with improved oil-retaining hubs protected by dust and mudproof caps. A handle-bar-controlled cork clutch can be fitted to the lady's model at an extra cost of £2 15s.



Car type foot brake—a standard fitting on the O.K. models fitted with aluminium up-turned footboards.

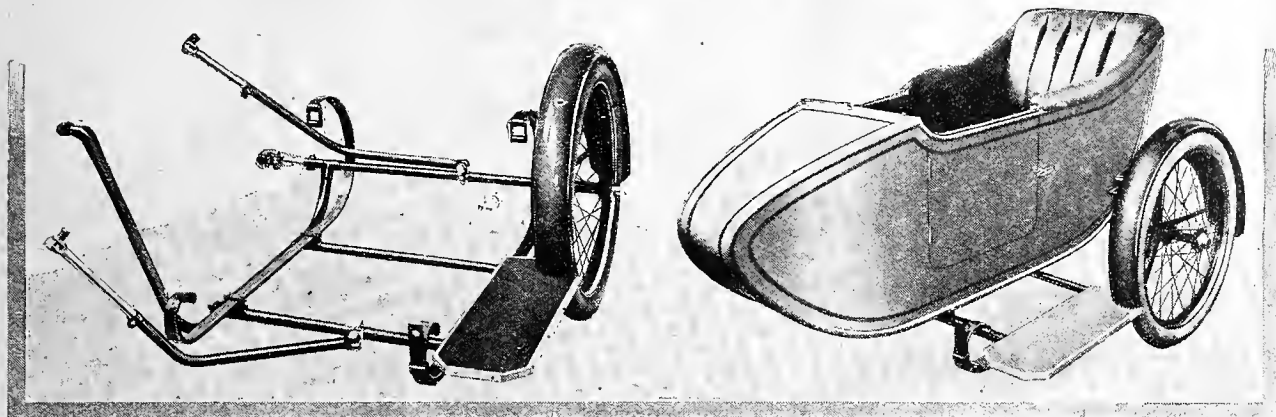
which many little two-strokes are somewhat at fault. The bore and stroke are 70 mm. (269 c.c.), and the Dixie magneto is coupled directly to the engine-shaft. Lubrication is by petrol,



The two-stroke O.K.—an entirely new model lightweight from the O.K. works.



## The New Ariel Sidecar.



The new model Ariel sidecar. The chassis view shows arrangement of the four supporting tubes to give ample clearance for the rider of the bicycle. The new design of footboard, to which is attached the mudguard, will be observed from the view of the complete sidecar.

**T**HE latest design sidecar to be placed on the market is a new Ariel, for which Components, Ltd., of Bournbrook, are responsible.

The chassis differs very greatly from that used during the past year, as the side tubes are curved upwards to meet the axle, thereby allowing the main frame to be much lower than it was. Also, the attachment tubes are four in number instead of three. As usual, there is one clip on the chain stay of the motor bicycle, and some four inches in front of the rear hub, which clip also is secured to the sidecar axle through a telescopic joint for adjustment. There is a curved tube, clipped to a lug on the axle, running parallel to the axle and then curving upwards to be attached to the seat pillar adjusting pin by a quick-action catch similar to the one used last year. From the forward cross-member there is another tube carried to the down tube of the motor bicycle and secured

by the same type of catch, while the fourth tube branches from the frame side tube to a lug on the tank tube, which lug has a seating in which the cone end of the attachment tube is held by means of a large hexagon nut.

All the attachment tubes are adjustable, and it is necessary only to undo two nuts and also to release two pins in order to remove the sidecar from the motor cycle.

### The Springing.

There are two long springs running parallel with the sides of the frame, and, curving up as a Cee at each end, from which the body is slung. On the rear spring there are small shackles connected to a flat strip of metal passing through the body, while the forward Cee spring end is secured direct to a similar flat strip underneath the nose of the body. Thus, the springing is well carried out and the body rides well without appreciable side sway.

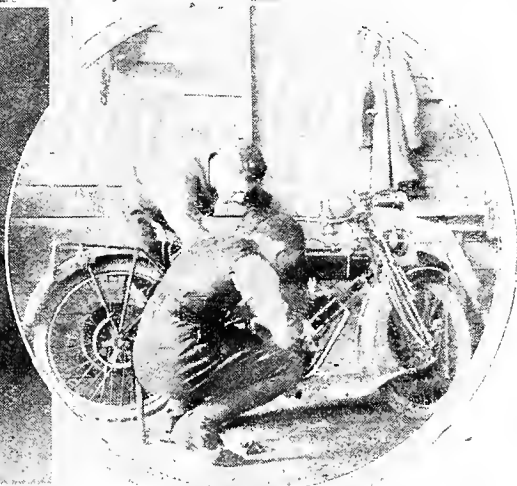
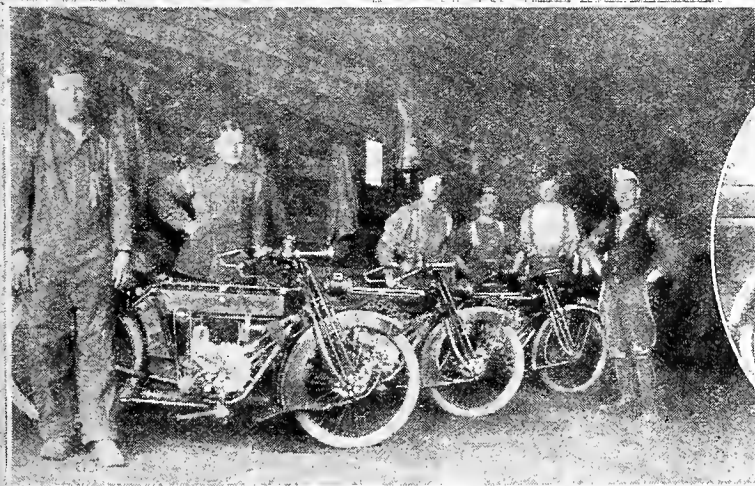
This year a special lamp bracket is fitted at the forward end of the rear spring, instead of utilising one leaf for this purpose as in last year's machine.

The wheel hub is much larger, and there is a neat footboard so placed on the side tube that it acts as the forward mudguard support, the other two supports being strong steel tubes of large diameter and carried in sockets near the hub.

Beneath the seat is a substantial locker. The upholstery is excellently carried out, the general appearance of the body being quite pleasing. The tubular carrier, brazed on previous models to the axle, has been removed, but, if desired, can be fitted as an extra.

### ROYAL RUBY SPEED GEARS.

The Royal Ruby Cycle Co. have decided to adopt the Jardine gear for their 1916 de luxe model motor cycles.



**P. & M.'s ON WAR SERVICE.** These two photographs were taken at the Brooklands aeroplane sheds, and show machines belonging to the Royal Flying Corps. P. and M.'s are used exclusively by this section.



## SPECIAL FEATURES

## OVERSEAS MOTOR CYCLISTS' OPINIONS.

## LOOKING BACK

:::

## FADS AND FANCIES.

## TIME TO LIGHT LAMPS

GREENWICH TIME.

Jan. 6th	...	5.4 p.m.
" 8th	...	5.6 "
in London half an hour earlier		
Jan. 10th	...	4.39 p.m.
" 12th	...	4.42 "

## Two-strokes in Holland.

"Twee takt" is Dutch for two-stroke. Incidentally these handy little machines are growing in favour in the Netherlands.

## A 1916 or 1917 Model?

We saw on the road last week a 4 h.p. single-cylinder Triumph fitted with all chain drive—not enclosed—and a free engine clutch on the engine-shaft, the countershaft gear being retained.

## Belfast and North of Ireland M.C.C.

The result of the Christmas Day novices' trial, held over a circular course in County Down, was as follows: 1, Bryson (B.S.A. sc.); 2, McCluney (3½ Peugeot); 3, Darragh (3 Enfield). Each of the above lost four marks. Other finishers were: Willox (6 Bat sc.), Young (2½ Calthorpe), and Hewitt (6 Enfield

sc.), each losing six marks; Baxter (4 Bradbury sc.) and Robb (4 Quadrant) lost eight marks each.

## Motor Cycles in Holland.

American motor cycle manufacturers are striving their utmost to capture trade in Holland, where, prior to the war, British machines were the most popular. In the absence of British supplies, mainly due to the European conflict, most of the American makers have appointed Dutch agents and sent over supplies of machines.

## Motor Cyclists and Machine Guns.

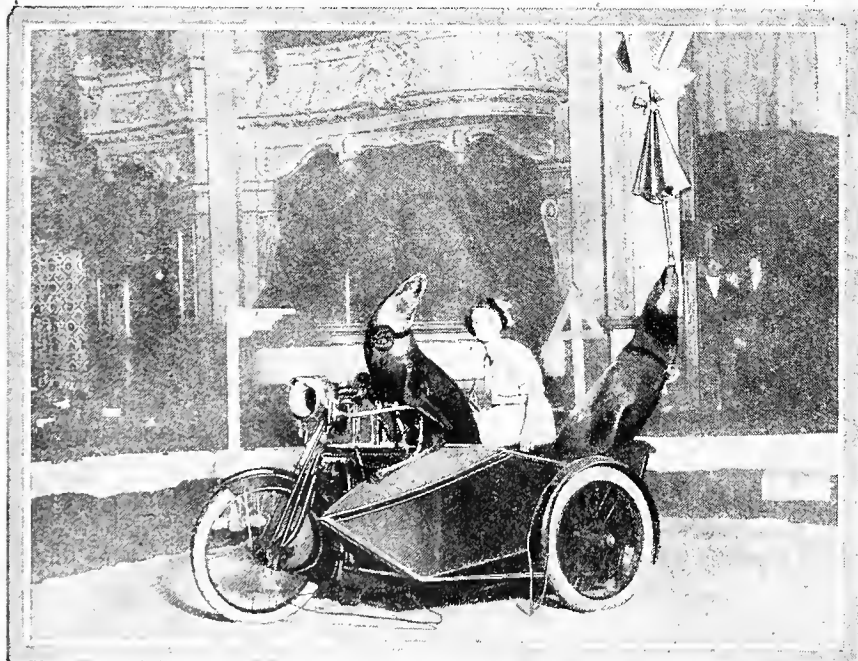
Many a motor cyclist has during the war period had the intricacies of a Vickers machine gun revealed to him, and to a man possessed of mechanical tendencies nothing is more fascinating in its working than a death-dealing machine gun. A new recruit usually goes through several stages during his training. At the first lecture his interest is aroused by the marvellous capabilities and intricacies of the gun; next time he is told a good deal more, and becomes overawed at the prospect of having to tackle it blindfolded; at the third stage he begins to doubt whether it is not too much of a box of tricks for him, but later sets his teeth and determines to master the gun.

Gradually getting more interested the recruit finally catches machine gun fever, talks about it all day long, dreams about it at night, and when on leave never tires giving little lectures to his parents and friends about the most successful gun of the war.

## Average Prices.

We give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted. If there were not at least two advertisements, then the last occasion on which they were quoted is given. Owing to the Christmas holidays intervening, the number of averages obtainable for last week only amounts to seven.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S.	1915	6 3-sp. sidecar	—	£90
"	1914	6 3-sp. sidecar	—	£72
"	1913	6 3-sp. sidecar	£57	—
"	1915	2½ 3-speed	—	£51
Allon	1915	2½ 2-speed	—	£36
Ariel	1914	3½ 3-sp. sidecar	—	£53
Bradbury	1914	4 3-sp. sidecar	—	£47
B.S.A.	1915	4½ 3-sp. sidecar	—	£70
"	1914	4½ 3-sp. sidecar	—	£56
"	1913	3½ 2-sp. sidecar	—	£44
"	1913	3½ 2-speed	—	£31
Calthorpe	1914	2 2-speed	—	£17
Clyno	1914	6 3-sp. sidecar	—	£63
"	1915	6 3-sp. sidecar	—	£50
Douglas	1914	2½ 2-sp. kick start	—	£38
"	1914	2½ 2-speed T.T.	—	£40
"	1913	2½ 2-speed T.T.	—	£32
Enfield	1915	6 2-sp. sidecar	£67	—
"	1914	6 2-sp. sidecar	—	£64
"	1913	6 2-sp. sidecar	—	£49
"	1915	3 2-speed	£48	—
"	1914	3 2-speed	—	£37
A. Excelsior	1914	7 2-sp. sidecar	—	£48
H. Davidson	1915	7 3-sp. sidecar	—	£79
Indian	1915	7 3-sp. sidecar	—	£74
"	1914	7 2-sp. sidecar	£56	—
"	1914	7 T.T., free eng.	—	£44
James	1915	4½ 3-sp. sidecar	—	£75
Lea-Francis	1915	3½ 3-speed	—	£63
Matchless	1914	8 3-sp. sidecar	—	£70
New Imperial	1915	2½ 2-speed	—	£29
"	1914	2½ 2-speed	—	£26
O.K.	1915	2 2-speed	—	£23
"	1914	2 2-speed	—	£23
P. & M.	1913	3½ 2-sp. sidecar	—	£43
Premier	1914	3½ 3-sp. sidecar	—	£49
"	1913	3½ 3-sp. sidecar	—	£44
Rex	1914	6 2-sp. sidecar	—	£48
Rover	1915	3½ 3-sp. sidecar	—	£56
"	1914	3½ 3-sp. sidecar	—	£41
"	1913	3½ 3-sp. sidecar	—	£40
Rudge	1915	3½ Multi	—	£47
"	1914	3½ Multi	—	£37
"	1913	3½ Multi	—	£29
Scott	1914	3½ 2-sp. sidecar	—	£54
"	1913	3½ 2-sp. sidecar	—	£48
Singer	1913	3½ free engine	—	£23
Sunbeam	1915	6 3-sp. sidecar	—	£96
"	1914	6 3-sp. sidecar	—	£80
"	1915	3½ 3-speed	—	£63
"	1914	3½ 3-speed	—	£52
Triumph	1914	4 3-sp. sidecar	£55	—
"	1914	4 3-speed	£47	—
"	1913	3½ 3-sp. sidecar	£50	—
"	1913	3½ 3-speed	—	£38
Williamson	1914	8 2-sp. sidecar	—	£62
"	1913	8 2-sp. sidecar	—	£55
Zenith	1914	6 Gradua sidecar	—	£56
"	1914	8 Gradua sidecar	—	£67



## LATEST ADDITION TO THE RANKS OF TRICK MOTOR CYCLISTS.

A P. & M. sidecar outfit used by the sea lions of Petite Nina at the Liverpool Olympia. The machine, under its own power, runs round and round the circus, while the two sea lions steer it, sound the horn, and balance things on their noses.

**An Oil-cooled Cycle Car.**

An advertisement reads: Humberettes for sale, one oil-cooled £60, one water-cooled £95. Was it intentional or a compositor's intelligent diagnosis?

**Petrol "Up."**

Another penny a gallon on petrol is unpleasant news. So far as we know, the makers of the Redline are the only firm not increasing the price. From tests made of the Redline spirit it has been shown that it gives the unusual combination of absence of knock and easy starting.

**Lighting-up Times.**

The new lighting regulations, which were reviewed in our issues of December 9th and 23rd, come into operation on the 10th inst.; when lighting-up time will be half an hour after sunset, instead of an hour as heretofore.

**Motor Cyclist Recruits**

Enquiries from motor cyclist recruits have increased during the past week, no doubt in view of the calling up of "groups," but there are no vacancies at present. Indeed, as we announced last week, the War Office will shortly issue new instructions respecting recruiting. In the near future the editor expects to be able to accept a good number of motor cyclists, but applications should not be sent until an appeal is published in our Recruiting Section, when certain particulars will be required.

On Monday last the number of applications personally dealt with by the editor of this journal, Mr. Geoffrey Smith, who is inspecting officer for the South Midland divisional area, totalled 6,110.

**Romance of the War.**

Extract from a Sunday newspaper:

"The engagement was announced yesterday of Miss Margaret Elinor Kingsborough, the only lady despatch rider in the British Army, her fiancé being Dr. Cody, assistant surgeon, Indian Medical Service. Miss Kingsborough is the only daughter of the Rev. Thos. Kingsborough, rector of Kildalton, County Armagh. When the Ulster Volunteer Force was being organised Miss Kingsborough, who is an accomplished motor cyclist, offered her services, and, being accepted, performed several daring feats throughout Ireland and across the Channel."

**Growth of American Exports.**

As showing the rapid growth of the United States motor cycle export trade, it is worth while comparing the export figures for last September with those of September, 1914. In the latter month the total number of machines exported was 118, whereas last September it was 1,683. It is fairly safe to assume that this great increase is in the main due to the inroads American manufacturers are making in the British Overseas Dominions and Colonies.

**Mentioned in Despatches.**

Major A. E. Holbrook, A.S.C., who was recently mentioned in despatches, is a very ardent motor cyclist, and was at one time a very keen rider of a Zenith. Before the war and in the early days thereof he did valuable work for his country in selecting machines for the W.D. His brother is Commander Holbrook of submarine fame.

Captain H. Blackburne, R.F.C., also recently mentioned in despatches, gave his name to the Blackburne motor bicycle, and was one of the founders of the firm of Burney and Blackburne.

**SIDECARS  
AND  
ACCESSORIES.**

In "The Motor Cycle" of January 27th a feature will be made of the latest sidecar attachments and motor cycle accessories.

**Home on Leave.**

Lieut. Maurice G. W. Burton, A.S.C., who before the war was secretary of the Cambridge University M.C.C., and one of the joint organisers of the last Inter-Varsity race meeting at Brooklands, is home on leave in England undergoing a slight operation. We wish him a speedy recovery.

**The National War Funds.**

At the week-end the principal war funds stood as follow:

The Prince of Wales's National Relief Fund (£2,793,000 distributed)	£5,668,098	0	0
The Times Fund for the Sick and Wounded	3,070,303	0	0
The Weekly Dispatch Tobacco Fund	96,003	0	0
The Queen's Work for Women Fund	167,566	7	9
The Belgian Relief Fund	1,266,000	0	0
Polish Victims' Relief Fund	95,011	1	6

**Lorry Drivers with Fur-lined Coats**

Scene at a site where old houses are being hastily pulled down to make room for extensions to an important munition factory. Several motor lorries are driven up by A.S.C. men dressed in fur-lined and collared coats, who calmly produce cigarette cases and smoke and chat while the workers load the lorries with debris—bricks, planks, and what not. Engines are not stopped—why should they be? Big motors are a fag to swing on cold days, and petrol costs nothing—in the Army!

**Brass Mudguards**

A reader in Singapore has placed an order for a horizontal-engined A.B.C. motor bicycle, specifying mudguards made of brass, the reason being that the roads in that part of the world are watered with salt water, which corrodes all other metals.

**Motor Cyclists as Combatants**

We are informed that certain motor cyclist despatch rider sections are being dismounted and the men put into the infantry. The men concerned were greatly surprised on receiving these orders. It is obvious from this announcement that there has been no shortage of despatch riders for some months past.

**American Manufacturers and German Trade.**

An American Consul in a German provincial town suggests that the German motor manufacturers will not be able to meet the home demand for cars and motor cycles after the war. As practically all usable vehicles have been confiscated by the Imperial Government, and makes of the Entente Allies will not be purchased, there will be an opening for American machines.

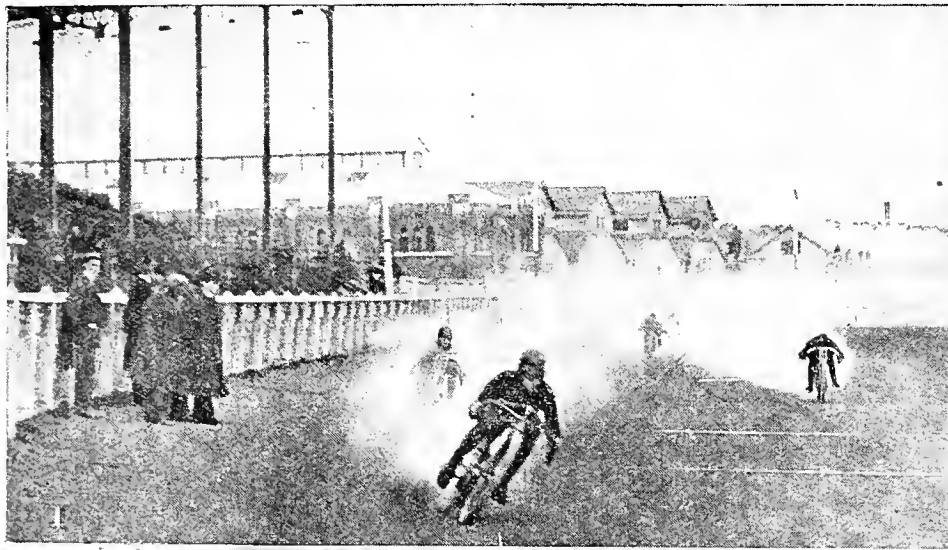
**Lord Montagu's Escape**

Though not actually a motor cyclist himself Lord Montagu of Beaulieu, who luckily escaped from the Persia disaster, has been a very good friend to the whole motoring movement, motor cycling included. In the early stages of the industry, when all motorists had an exceedingly hard uphill fight, Lord Montagu nobly upheld their cause in Parliament, when he was the Hon. John Scott Montagu. In his paper *The Car*, which he edited for so many years, he from time to time fostered the motor cycle movement, and devoted a portion of the journal to motor cycle matters. He is a practical engineer, and served his time in a locomotive works.



A group of Triumph testers with their armlets. In the foreground will be noted Lloyd, Cheshire, and Shemans—three well-known names in the competition world before the war—now engaged on the testing of Government motor cycles.

# VARIOUS PHASES OF MOTOR CYCLING OVERS

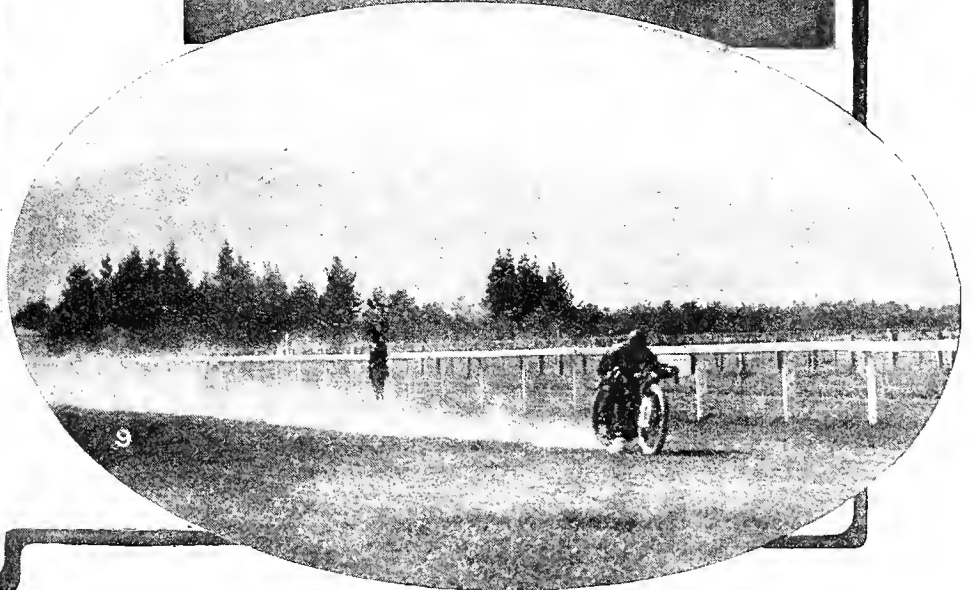
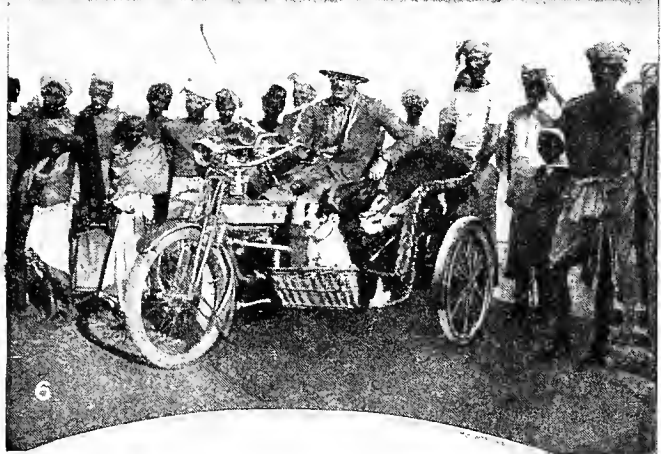
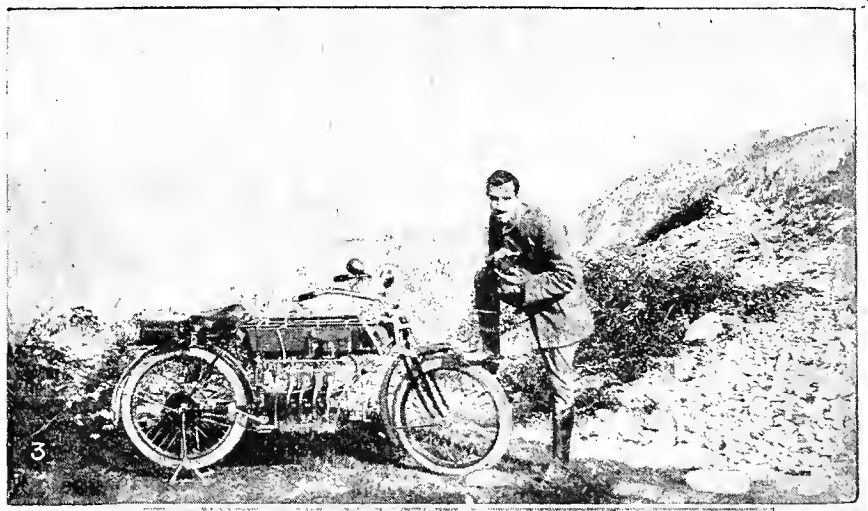


1. CANADA.—Track racing at Toronto
4. SOUTH AFRICA.—A sidecar outfit negotiating sand in the Groot Karoo, between Bulstown and Victoria West
7. SOUTH AFRICA.—Rider of sidecar outfit crossing a water-splash on a main road in the Cape Peninsula.
2. SPAIN.—Rider of an Indian at the this make were first and second.
5. BURMA.—A native of Rangoon start
8. ITALY.—A hill-climb through the m



VIEWS FROM DIFFERENT QUARTERS OF THE GLOBE EXEMPLIFYING THE UBIQUITY OF THE MOTOR CYCLE.

AS.



usion of a road race in which machines of

or a run on his Rudge and sidecar  
reet of a mountain-side town.

3. ITALY.—An F.N. rider surveys an imposing view after a long mountain climb
6. INDIA —An early pattern Rover and sidecar with a local setting.
9. NEW ZEALAND.—Grass track racing on the Tanker-nikan racecourse near Featherston, North Isle.

## British Machines' Successes in Australian Trials.

**W**HATEVER may be the percentage of American machines to British in Victoria, Australia, there is no getting away from the fact that in open competition the British machine is hard to beat. In these days, when we are hearing such a lot about American trade competition for our Overseas business, it is good to learn that in an open one-day trial, held on October 23rd by the Victoria Motor Cycling Club, British machines took premier honours.

The course was from Melbourne to Marysville and return, this route including climbing the Black Spur Mountains. A bad storm made the trial very trying

for both riders and machines, and in one part, we are told, the road was under water for a distance of five miles.

Competitors were divided into three classes, and the results were as follow:

### SIDECAR CLASS.

1. T. G. Rogers (6 A.J.S. sc.)
2. S. Jenkins (6 J.A.P. sc.)
3. H. J. Garnham (6 Ariel sc.)

### SOLOS UNDER 600 C.C.

1. E. Tyler (Triumph).
2. H. Godfrey (Precision).
3. J. Booth (Indian).

### SOLOS OVER 600 C.C.

1. B. Finley (Excelsior).
2. W. J. Ousley (Indian).

The best performance of the day was made by Rogers on the A.J.S. outfit, as, in addition to winning his class, he also

secured the special prize for the best showing irrespective of class. He only lost three marks, caused by a puncture, and the fact that this was his first appearance in competition work makes his performance all the more noteworthy.

### Road Race in Western Australia.

British machines also secured premier honours in a Western Australian competition. This was a 150 miles road race—out and home—from Perth, the capital. Results:

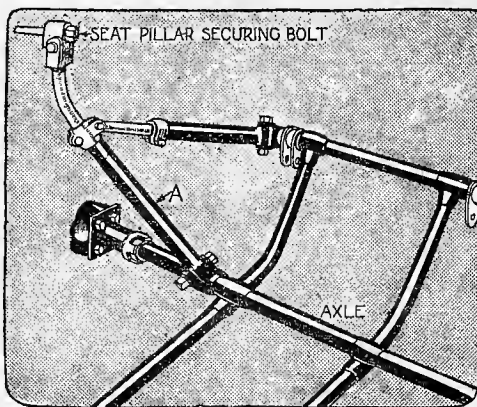
1. L. Perry (3½ Rudge), 3h. 52m. 50s
2. H. V. Norton (2½ Sunbeam).
3. C. J. Lewis (7 Indian), 3h. 18m. 31s.

Lewis made fastest time, his average speed being 45.25 m.p.h.

## Canoelet Sidecar Chassis Still Stronger.

**T**HE latest model of the Canoelet sidecar, manufactured by Mead and Deakin, is little altered, but small as the alteration is it indicates that the firm is still pursuing its experimental work in spite of the difficulties of labour and of obtaining raw material. The nature of the alteration proves that much study has been given to the stress diagrams of the sidecar frame.

As will be seen in the sketch, a new supporting tube A running from the axle to the bolt holding the seat pillar has been embodied in the frame. It has a telescopic joint for adjustment. At the axle end is a jaw joint, while another tube runs from the rear cross-member, which holds the spring shackles, to the split lug securing the telescopic joint. Thus the pull on the sidecar is taken down these two tubes as well as on the two front attachment tubes and the



Rear view showing new supporting tube.

adjustable clip securing one end of the axle to the chain stays of the machine. Also the chassis is stiffened considerably, while being supported at five different points.

For the rest, the frame is unaltered, nor has the body been redesigned, the rear springs curving up to meet pins on the two shackles which can be seen on the rearmost tube of the frame.

### SIDECARS AND ACCESSORIES.

January 27th has been fixed as the date of a special issue of this journal dealing principally with sidecar attachments and motor cycle accessories of all kinds. This issue will be enlarged, and numerous illustrations will be included.

Newly designed accessories should be submitted to the editor without delay, with a view to inclusion in this special issue.

## English Rider's Observations at the New York Show.

**O**WING to there being no show at Olympia, it was with especial interest that I contemplated a visit to the National Motor Cycle, Bicycle, and Accessory Show at Madison Square Garden. This was the first time that the motor cycle show had been held separately from the automobile show, as in previous years it has been customary to hold the motor cycle show at the Grand Central Palace together with the overflow of automobiles from the Garden.

The first thing to strike me on entering was the comparatively small size of the show compared with Olympia, for the galleries were not in use, as the machines and accessories were all accommodated in the area itself.

The new Cleveland lightweight has already been described in *The Motor Cycle*, but a word concerning the method of staging the show model may prove of interest. A complete machine was enamelled pure white throughout, even to saddle, handle-bars, etc., and was then mounted in a large gold frame lined with black velvet. Just inside the frame a row of electric lights ran round the sides and were fitted with reflectors so

that the rays were directed on the motor cycle. I have no hesitation in saying that it was far and away the most attractively got up exhibit in the show.

The Smith motor wheels are, of course, made under licence to the Wall Auto-Wheel Co. It is interesting to note that the price in the States is £12. Speaking of the Smith reminds me of the Dayton motor bicycle (the Davis Sewing Machine Co., Dayton, Ohio), as this machine is in reality an ordinary bicycle with a motor wheel in place of the usual front wheel.

There were several freak machines, if I may so term them, one being the "Auto Ped" (if I remember rightly), a hybrid composed of aeroplane wheels, small air-cooled engine, the frame and steering-pillar very much like a child's "glider," and towards the back of the "chassis" (?) a tiny saddle. The total weight of this contraption would be about 40 lb., and it could easily be lifted with one hand. Another machine of unconventional design was "Le Militaire," the specification of which includes channel chassis, four-cylinder engine, artillery wheels, three-speeds, reverse, small side

wheels raised or lowered by a lever, and which, when on the ground, supports the machine so that one can reverse even when riding solo.

A few weeks before the show there had appeared in the trade papers an announcement to the effect that a new motor cycle would be placed on the market at a very low price; it was, in fact, to be the "Ford" of the motor cycle world. This machine was exhibited at the show under the name of the "Tiger Autobiike," and was of very light weight and fitted with a two-stroke engine, but a close examination did not impress me very favourably.

The accessory exhibits were on the whole rather a poor showing, and the sidecars leave much to be desired in the way of comfort and finish.

Considerable interest was evinced in the motor cycle machine gun and motor cycle ambulance exhibited by the National Guard, and it is interesting to note that motor cycle sections are to be attached to several branches of the American Army.

## MILITARY NOTES.

## Motor Machine Guns in the Official Film. Army and Navy Honours for Motor Cyclists.

## MOTOR MACHINE GUNS PREPARED.

IN the official cinema film, "Britain Prepared," naturally the Motor Machine Gun Service is represented. As a matter of fact, the section of the M.M.G.S. is one of the most attractive, for the sidecars and the motor cyclist scouts flit about here and there, some emitting smoke from the exhaust, which, from a spectacular point of view, adds animation to the scene. (Perhaps we ought not to have known this!) First, the battery is seen to fall in and move off in orderly manner. The battery arrives in open country, a section commander and scouts on motor bicycles leading, the gunners take up their positions, and after several rounds (during which a smoke bomb gives quite a realistic effect), a rapid retirement is effected, the whole of the movements being made with the utmost precision. The smart manner in which the men mount and dismount their guns from the sidecar chassis is perfectly extraordinary. Altogether the film gives a vivid idea of the rapidity and ease with which a sidecar machine gun battery may be concentrated at any given point in the shortest possible space of time. There are stretches of rough going which show what the modern sidecar outfit will withstand if need be, and the sight of the gunners turning round in an extremely narrow space—a point where the sidecar scores over the armoured car—makes a lasting impression.

These films, "Britain Prepared," are to be exhibited in neutral countries, and we advise readers of this journal, wherever they may be, not to lose an opportunity of seeing them. Anybody who may have doubted the efficacy of sidecars in modern warfare will quickly change his views.

A few weeks ago we were privileged to see a private view of the film, which can be recommended as a tonic.

## DESPATCH RIDERS' DIFFICULTIES IN MACEDONIA.

IN the course of a letter, reproduced below, from Sapper C. D. Wallbank, R.E., written from Salonika, one obtains an idea of the difficulties that will have to be encountered by despatch riders when an Allied advance is made. According to our correspondent, the present condition of the roads in the war zone on the Western Front is like a billiard table when compared with the tracks around Salonika. The writer says:

"I have had your paper sent to me every week since the war began, and I can assure you that I anxiously await its arrival, too, as one cannot forget the old sport, no matter where one may be. I have only just left Flanders myself. Whilst there I continually came across H. R. Davies (of Sunbeam fame), "Duggie" Brown (of Rover), Godfrey Boyton (Triumph), and Lovegrove (Scott), all in the same section. The paper goes the rounds after I have finished with it, and I should think it must go through at least a hundred hands in no time. We shall be jolly

glad when this business is all over, and I shall then return to the favourite 'pastime keener than ever.

"I do not know how any motor cycle will fare out here; there are no roads, only mule tracks covered with huge boulders, etc. It is simply terrible. As regards mud, one can easily imagine this, seeing that it is all hills and mountains and continually raining hard, and the water streams all over the mule tracks. The poor D.R.'s will be tried more than ever now. I have been all over Flanders, Belgium, and France, and I can truthfully say that there is not a road there that would in any way compete with these around Salonika. We could have some wonderful hill-climbs here, but whose work has been am afraid the high referred to in "Military speed merchants Notes." He was recently would come to grief. home in Cardiff on I should never come leave.

pete again if I thought the English roads and hills had turned out like these; one would want a new machine after every competition.

"I should like you to warn all D.R.'s coming out here to bring plenty of rainproof kit. Any readers who have oilskins and sou'-westers to dispose of could not do better than send them out here."



Lance-Corporal A. B. Wade, of the M.M.G.S.,



Sergt. E. J. Bass, R.F.A., a leading light of the Essex M.C. in the pre-war days. He commenced his active service work as an ambulance driver.

## A RED LETTER DAY WITH THE M.M.G.S.

"CHRISTMAS Day at Bisley camp was a day long to be remembered," writes a gunner in the Motor Machine Gun Service. "White tablecloths in the general mess-room (a most unusual thing) were the first things to attract attention. A clean knife, fork, and spoon were waiting for each man, and drinks were provided free. Major Coulson read a letter from their Majesties the King and Queen, and drank a toast to the M.M.G.S. The fare provided included turkeys, geese, chicken, peeled potatoes if you please, with two vegetables, and Christmas pudding. What a time we had! No wonder we spent a jolly good time on Christmas Day.

"It was rather quaint to see men destined for Overseas service walking about the camp in the rain wearing sun helmets."

## ARMY AND NAVY HONOURS.

To BE K.C.B.

COLONEL H. C. L. Holden, assistant director of transport at the War Office. The inventor of the Holden motor bicycle, and Vice-president of the A.C.U.

PROMOTED TO COMMANDER.

Flight-Lieutenant E. V. S. Wilberforce. Well-known competition rider of a Douglas motor bicycle.

PROMOTED TO LIEUTENANT.

Flight Sub-Lieutenant L. P. Openshaw.

MENTIONED IN DESPATCHES.

Captain A. E. Davidson, R.E. Member of the Technical Committee of the R.A.C., officiated many times as judge on the occasion of A.C.U. trials; timekeeper at Brooklands.

Temporary Captain C. M. Smith. Former director of Zenith Motors, Ltd., a keen motor cyclist in his early youth, and a prominent designer in the automobile industry.

Temporary Lieutenant C. Q. Roberts. One of the principals of Messrs. Burney and Blackburne, Ltd., and a well-known competition rider. Killed in action at Festubert.

Captain H. de Haviland. Was formerly with the brothers Burney, and one of the early designers of the Blackburne. Well-known as an aviator.

Brevet-Lieutenant-Colonel A. R. Hildebrand, D.S.O., R.E. An officer who had much to do with the training of motor cycle despatch riders before the war and during the early part thereof.

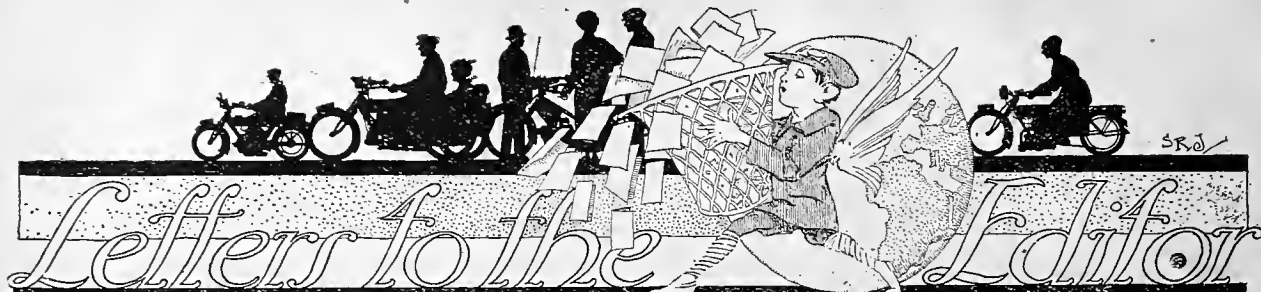
Temporary Second-Lieutenant C. T. Cadman, motor cycle section.

Temporary Captain C. M. Gamage, London Divisional R.E.

Corporal T. G. Campbell, motor cyclist, No. 30291, Wessex Divisional Signal Co.

Fourteen officers and men in the Motor Machine Gun Service.

Gordon Gibson, a former Triumph competition rider, has joined the A.S.C., M.T., and expects to go abroad shortly.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

### Motor Cycles for Home Service Men.

Sir,—Your correspondent "C.P.O., R.N.V.R.," in the issue of December 23rd, 1915, opens up an interesting question. I trust through your paper it may be possible to hear of opportunities of either getting facilities granted, as he suggests, or even some of your readers or others in trade circles may realise that many of us on Home Service, or with training yet to be completed, have financial status now "below par" compared to "civvy" experiences or conditions.

For myself, I have a permanently damaged right arm and wrist (got in the way of Turk bombs!) and a shrapnel splinter below the knee, which still remains; surgeons consider it dangerous to remove. Push cycling is not possible. My future work will leave time for motor cycling, when the days would pass, as in years gone by, most pleasantly. Arrears of pay need time to get, but if I could hear of some "Christian" with a decent lightweight to part with, in the circumstances I would gladly pay up a price within my reach. Other fellows in the same boat as I would no doubt be grateful if you could thus "help us along."

CORPL., R.E.

### On the Road with a 3½ h.p. Scott Sidecar Outfit.

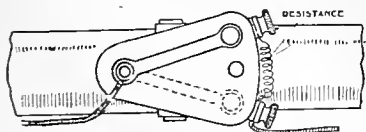
Sir,—I was much interested in H. Mortimer Batten's article on the Scott, but the reference to the low weight of the flywheel is surely not accurate. The real reason of acceleration, so far as it is governed by the flywheel, is, I consider, the absence of heavy oil round it and because it is large and has a heavy rim. Then as regards his reference to the back tyre, I certainly found mine wear better than on any four-stroke single or twin either, and I consider the gears excellent for long life of tread, both for standing start and also manipulation when moving, as a certain amount of slip takes place on changing.

MAJ. GROUT.

### Varying the Power of Electric Lights.

Sir,—I have noticed several letters in *The Motor Cycle* regarding dimming electric head lamps on motor cycles. The latest, by "W.K.O.M.," would not work unless the head and tail lamps were the same voltage and candle-power, which is seldom the case.

I have fitted to my Indian a very simple device (the sketch explains itself). It is an old two-way switch as used



Method of dimming electric lights described in the accompanying letter from "D.T."

on motor cycles when accumulator ignition was in vogue. The coil is made of about 3in. of 30 gauge M wire, obtainable at any electricians, and wound round a nail to form a coil, more or less being used to suit individual requirements.

This system is not as wasteful as many think. It does not use the same with light dim as with full light. An ammeter in circuit will soon prove this, as the light is dimmed by cutting down the current passed through the lamps.

Trusting this will interest at least Indian riders, D.T.

### The New Lighting Regulations.

Sir,—May I thank you for your note on the light question in your last issue? The notice posted up in our village most distinctly says "all head lights whatever strictly prohibited," which one naturally supposed referred to motor cycles and cycles in general.

A.L.H.

### The Mysterious Sidecar.

Sir,—Your contributor, Dr. A. M. Low, whose article has held my attention and interest, has certainly covered a wide range of engineering science. His statements will not, I trust, come as a shock to other engineers. In such contention, are we to fling aside wisdom obtained through ages of "bridge" engineering, or to infer that the principle of a span or bridge between the wheels of a motor cycle and sidecar is different from that obtaining in other engineering? I do not think such "bridge" can be made flexible in the sense, I gather, he means, the only way of securing it being by orthodox methods and metals, such as spring wheels or the frame constructed of spring steel. The axles of Mr. Henry Ford's car are rigid axles, the designer having taken care that the general lack of rigidity does not apply to his axles, which spans or bridges cannot in any sense be termed "springs." I think that it is rather "in the clouds" (no pun) to labour the aeroplane suggestions. The designer of sidecars is not dealing with occasional landing shock, but with continuous impact and load. Wood chassis! (Am I to take it Dr. Low means them to be without metal flitch or other reinforcement?) *horrible dictu*. Springy wood chassis and with a general lack of rigidity, cost not to exceed thirty shillings! Dr. Low would no doubt provide us also with "the mysterious human monstrosity" to drive it over an A.C.U. course, and may I, like Gilpin's observer, be there to see.

BERTRAM G. SMITH.

Sir,—Respecting the contribution by Dr. Low that appeared in your issue of December 30th, I beg to differ very widely from your contributor's ideas as to the construction, springing, and utility of the modern sidecar.

Whilst I have no intention of impugning the feasibility of Dr. Low's ideas pertaining to the construction of sidecars, I strongly resent the modern sidecar being criticised in such sweeping statements, most of which cannot be substantiated.

Your contributor has apparently lost sight of the excellent lightweight sidecars that have been designed to give maximum comfort with the minimum of weight, and, furthermore, can be detached or attached in a few minutes, and, speaking from experience, are perfectly devoid of the trouble and disadvantages stated by him.

I have convincing proof that "a rigid chassis as strong as one which is slightly flexible" does not mean doubling the weight, provided the design is such that the weight is distributed to the proper quarter.

In referring to "the average sidecar being sprung no better than a farmer's cart," your contributor (a learned man, I admit) gives proof that he has either never ridden in a farmer's cart or in a modern sidecar that has been built by a reputable firm.

This is not destructive criticism but common sense.

LEONARD B. HENDERSON.

(Designer Henderson Sidecars.)



**Duplex Lubrication.**

Sir,—I read with interest, as I always do, the article by "Ixion" published on Dec. 9th. I should like to suggest that "Ixion" for once has been caught napping, and that his oil consumption is more in the neighbourhood of 14 fluid ounces than 44 fluid ounces per 100 miles (a quart). My own two-stroke is always slightly over-oiled with a petrol mixture which works out at about the above consumption of oil, and I may say that the bearings on this engine are, in an expert's opinion, still quite sound after practically daily use for eighteen months. I think if "Ixion" will carefully measure the oil delivered by his drip-feed pump he will find it to be very little indeed over  $\frac{1}{2}$  fluid ounce instead of two ounces, thus making his consumption much the same as my own.

I had occasion to handle a  $3\frac{1}{2}$  h.p. J.A.P. engine the other day, fitted with a drip-feed, and the owner and myself were much worried with lubrication until we measured the pump ( $\frac{1}{2}$  oz. only) and gave a charge every  $2\frac{1}{2}$  miles. The result was quite satisfactory and did not over-lubricate.

In conclusion, I should like to say that, after experience for several years of various types of machines, I have not yet met anything to beat the two-stroke with petrol lubrication for general handiness at speeds up to 33-35 m.p.h. and average speeds of 23-25 m.p.h. in ordinary country. In September last I ran from Newbury to Bournemouth, Bournemouth to Weston-super-Mare via Shaftesbury and Cheddar, Weston to Pontypool via Bristol, Gloucester, and Chepstow, Pontypool to Newbury via Severn Tunnel. The total trouble was a broken magneto chain (known to be weak and spare carried) at Cheddar. Weight carried, myself 10 stone, luggage about 24 lb. Jet, No. 24 Amac. No failures on hills or other trouble barring the chain.

Thirty-three to thirty-five miles per hour is the limit, I consider, for an ordinary 269 c.c. two-stroke in touring trim and with two-speed gear box. Higher speeds may be obtained, but I should very much like to see this question threshed out properly. Only the other day I read an advertisement in which a man claimed to have travelled at 49 m.p.h. on a machine of this type. I consider this likely to deceive buyers who are not expert motor cyclists, and likely to give them quite a wrong impression as to the capabilities of the machines, which will go practically anywhere in their own time, but not at 40 m.p.h. W. S. PULLEN.

**A Clever Sidecar Conversion.**

Sir,—A friend of mine was the proud (?) possessor of an out-of-date wicker sidecar, which was not underslung, and recently I set to work, in my spare time, to modernise it at comparatively little expense. The photographs show the result achieved.

The frame is ash covered with three-ply wood. The seat back is loose and gives access to the back portion, which is for spares, etc. There is ample leg room. The new body is lighter than the old basket one. The chassis was not altered in any way, the bearer bars fitting the new body with the addition of 5in. links at the back to bring the body level.

Owing to it being low and tapered at the front and back, the combination will take hills on top gear that had to be taken before on bottom. Further, it is warmer and more comfortable than the old basket.

After being faced up with lead paint, it had two coats of green and two of varnish, and upholstered in green it looks smart, as well as being warm and comfortable.

FRANK MOAT.

**Two-stroke Lightweights—A Criticism.**

Sir,—The letter from C. Binks, Ltd., in your issue of last week, re two-stroke lightweights, is most interesting, and, alas, as I know to my cost, too true.

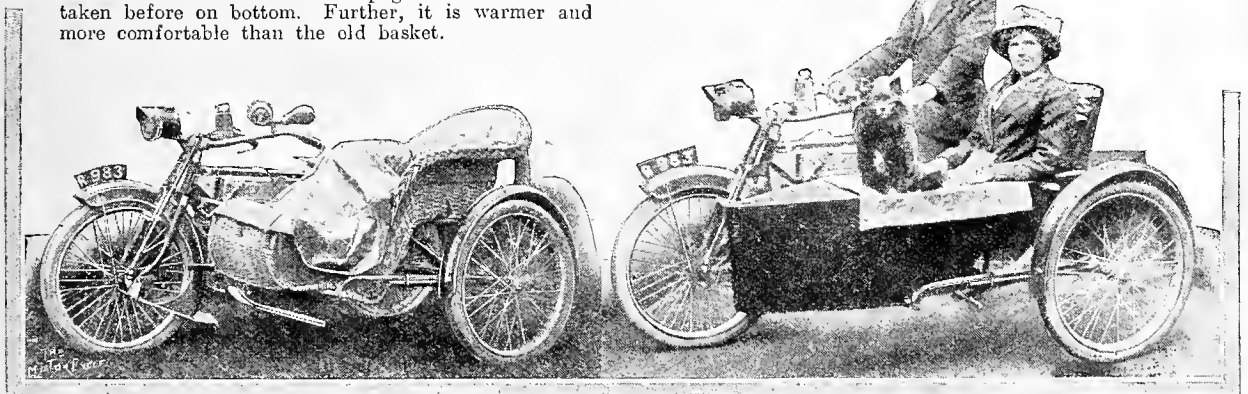
I have just purchased a new 1916 model  $2\frac{3}{4}$  h.p. two-stroke two-speed machine, which was spoken of by your contemporary as "noticeable for its . . . remarkably efficient mudguarding." It was partly due to this that I decided on purchasing the machine I have now. I wish I could compel the writer of the above statement to ride this machine for the rest of his life on roads under conditions similar to those of the past week! I rode my machine down from London, about fifty miles, and the state I found it in next morning was heart-rending. It was smothered in mud; and thank goodness I had overalls on! The chain was very gritty, the coil and band brakes so full of grit and wet that the wheels would hardly go round. I thoroughly cleaned the machine and overalls, and started out to a place *only two miles away*, and on arriving there found that the front part of the tank was plastered with mud, so that its colour—of Royal blue—was not recognisable. My boots were not fit to go into any house with, likewise my overalls, which were smothered halfway up my thigh!

When will the manufacturers use some commonsense, and turn out a machine which will keep engine, working parts, and last, but not least, its rider clean under winter conditions? I have ridden one lightweight, and only one, which has got efficient mudguarding, and as I am not a trade rider I may mention its name—the Douglas. I rode one in Devon over much worse roads than the ones round here (Buckinghamshire), and, except to keep myself dry, I did not have to wear overalls. So if one firm can make a machine with efficient mudguards, all makers can, and I think they deserve great censure for their slackness in not paying attention to this most important item of motor cycle construction.

Having always found rim brakes satisfactory, I feel entitled to say that such fierce brakes as coil or band ones are absolutely out of place on lightweight machines.

I had a 1914 6 h.p. combination which had flaps extending on each side of the front mudguards. One night, on my way back from Wendover, I heard a scraping noise. Stopping the machine, I found the right mud flap was hanging by the proverbial thread; I pulled it off. Since then, to my astonishment, I found that my right leg, above the thigh (the boot and leg up to knee were protected by leg shields in front of footboards), kept perfectly clean, whereas the left one always got smothered in bad weather. The 1916 model of this machine has omitted these flaps, and has thoroughly efficient mudguarding.

AN ALL-WEATHER RIDER.



Sidecar conversion referred to by Frank Moat (see letter on this page).

**Wanted, a Motor Tricycle.**

Sir,—I am nearly sixty years of age, and, owing to the war, I find I must resume duty after having retired some years ago. I was for years a cyclist, but now, owing to failing strength, I am compelled to adopt motor assistance, as I have to be on the road in all weathers. I do not want a motor bicycle on account of side-slip; what I want is a motor tricycle, easily managed, which will travel about 15 m.p.h. I think a 2 or 2½ h.p. would do, but the frame must be 22in., as I am short. Can any of your readers recommend such a machine?

—R. AITCHESON.

**Easy Starting.**

Sir,—Allow me to express my thanks to your correspondent Mr. J. Douglas for his letter on this subject in your issue of November 11th.

I ride a 5-6 h.p. Rudge-Multi and sidecar, and have followed out his instructions respecting the Senspray carburetter, and am more than pleased with the result. I have possessed this machine for a couple of years, and ride it throughout the year, wet or fine; and in cold weather it was at times very difficult to start the engine. Since I have made the improvement with the Senspray carburetter I can now start it with one single thrust down of the pedal. I can strongly recommend all riders of Rudge-Multis to adopt Mr. Douglas's idea, and I am confident they will be grateful to him for his suggestion.

J. WRIGHT.

**The Chater-Lea Carrette.**

Sir,—Your article in *The Motor Cycle* of December 23rd in reference to the above has greatly interested me. I have been looking out in your journal for some time for a direct-driven small car such as the above. I have been almost on the point of writing you before to suggest that same idea for small cars. It is, to my mind, the only correct way of driving any vehicle, car, or cycle. To drive at a right-angle, as in the orthodox type of petrol car, is wrong. The former method, I think, must be more productive of m.p.g. If such a car were "perfectly satisfactory" in 1907, why not adopt the same method of drive now? (I do not forget that there are the Seal and the H.S.M.) I do not own either car or motor cycle myself (I wish I did), being but a humble pedal-cyclist, but I would like to see some readers' opinions on the above subject.

H. R. ETCHILLS.

**Wanted—Detail Improvements.**

Sir,—I hope you will give my letter a space in your valuable journal, as I should like to point out where my favourite mount can be improved.

As everyone knows, motor cycle riders are doing wonders in this great life and death struggle. We have a good engine, frame, and wheels, but we want something to keep our legs warm and dry, also to cut off vibration to the spine.

In civil life my work brought me a lot of riding in all weathers, and so I procured a set of weatherproofing accessories made by the Kumfurt Motor Co., of Cookham, Berkshire, and I only wish now that I had brought them out here with me. Their knee grips were a revelation to me, and when used in combination with their hammock footboards were as good as a spring frame without the complications. These footboards, too, besides cutting off vibration from the legs, do just what is necessary to keep the rider's legs warm and dry.

I hope, if you put this letter in your columns, it will be read by those who have the power to alter things, as I think you will agree with me that by altering a few fittings a machine can be turned into the true all-weather-all-road-motor-cycle-car.

H. H. BENFIELD (Sergt. R.E., France).

**The Motor Cycle in the Balkans.**

Sir,—Although I am not in the least known to you, I should just like to write and let you know how really pleased I felt when a long-expected mail which arrived recently brought me three copies of *The Motor Cycle*, and amongst them the annual Buyers' Guide, which is of great interest not only to me but to all the other readers of your valuable paper who have been waited suddenly out of that comparatively home-like country, France, into this outlandish spot! People at home may possibly think that motor cycles are unknown in this expedition, but that is not so at all. Three-speed countershaft Triumphs and 2½ h.p.

Douglases abound, while there are a few other makes to be seen also. Recently I noticed a 4 h.p. Douglas and sidecar doing great work over a ploughed field, but this is the only passenger machine I have seen, and as yet there are no M.M.G.S. with this force. The roads are few and far between, but those that there are are quite passable, though they are gradually being ruined by the never ceasing streams of motor lorries which pass up and down. Many of the camps lie away from the roads, and D.R.'s have to make their way across all sorts of ground to reach them. Recently we had deep snow and twenty-five degrees of frost, and it was no joke riding them as you may imagine. However, in spite of all the difficulties and hardships of this campaign, everyone is very cheery and determined to make the best of it, though most people are wishing they were back in France and able to get occasional leave.

I trust I have not bored you, but I thought you might just like to know how much your paper is appreciated out here, and also that the go-anywhere motor cycle is doing its duty bravely amongst the rocky hills and muddy valleys of Greece and Serbia.

B.A.R.E.

Macedonia.

**Fittings on American Motor Cycles.**

Sir,—I do not wish to enter into any argument as to American motor cycle fittings (I prefer English), but your correspondent, Mr. S. A. Serpell, would make out that fittings on English machines are bad.

Everyone to his own experience. I may say I have a motor cycle (Zenith-Gradua) which has done 15,000 miles, and not once have I had any trouble with the rusting of wires or any other fittings, or with the machine itself.

As regards gears, with the ever-reliable Gradua, high or low gears do not worry me; I can always get the gear suitable to the load and road conditions.

As regards the American firms sending a mechanic if the machine breaks down, why not have a motor cycle which does not break down?

EDWARD COX.

Sir,—I am glad you have taken up the cudgels on behalf of English motor manufacturers and agents in the matter of "service." A very striking instance of their courtesy and thoroughness in this respect came to my notice the other day.

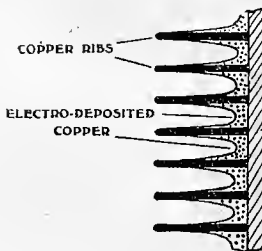
A B.S.A. rider was "hung up" last week, seven miles from Birmingham, through magneto trouble, due to a week's riding in vile weather and flooded roads, and compelled to finish the journey to town by train. At 5.30 in the afternoon he rang up the city agents, and explained his troubles. At 11.15 next morning he called by appointment at their establishment in Broad Street, and was driven by their mechanic in a luxuriously appointed outfit to the scene of the breakdown, and by one o'clock the machine was on the road once more, with a new magneto fitted.

ON DRAFT.

**Cylinder Cooling.**

Sir,—I am enclosing a sketch showing a method of fitting thin copper stamped ribs to cylinders of engines, which was described in my British patent No. 19,969, of 1909, but this method of rib fixing was not claimed, and any of your readers are quite at liberty to use it.

The ribs are made from thin copper stampings, and are slipped on to the cylinder, and held the desired distance apart by any suitable means; the ribs and cylinder are then covered, and fixed together by a coat of electro-deposited copper, as sketch.



The advantage of this method is the close association of the ribs and cylinder with the electro-deposited copper, which gives the most efficient conduction of heat from the cylinder.

I have never tried this method of cooling, but have been informed that it is quite possible to deposit the copper on both cylinder and ribs. If any of your readers should try the experiment I hope they will let their fellow-readers know the result.

FRED UMPLEBY.

# QUESTIONS & REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## An Automatic Inlet Valve.

**Q.** I have a motor cycle with an automatic inlet valve. (1.) How far should the inlet valve open? (2.) How strong should the spring be? (3.) How can I find a leakage in the float? I have taken the float out and tried it in petrol, but I cannot find the leak.—G.H.J.

(1.) About  $\frac{3}{16}$  in. (2.) So strong that the valve will just open when you hold it by the seating and jerk it sharply. (3.) The best method is to place the float in boiling water. This will cause the petrol to evaporate, and the bubbles caused by the vapour escaping will indicate the leak. This method also avoids any likelihood of injury to the float.

## Blow-back on a Two-stroke.

**Q.** I have a 1915 two-stroke, Amac carburetter, Dixie magneto, and fixed ignition. It has run 3,500 miles during the summer without a fault, up hill and down. It has a 23 jet, and is doing 100 miles to the gallon. During the last three weeks it has developed blow-back through the carburetter. This occurs whenever the machine has hard work to do. Up a long steady incline it will commence this blowing back, explosions occur at the carburetter, and it emits puffs of smoke. It will often come to a standstill, or else force one to drop down to low gear on an incline or hill that it used simply to roar over. The engine is perfectly clean. I can find no leaks. Plug changed, ignition timing and everything else checked, but no result. Closing the air lever does not cure it, and a new 28 jet makes no difference. I have tried several other carburetter adjustments, but with no improvement.—H.A.W.

The trouble is in all probability owing to pre-ignition, due to a faulty plug (try a new one of good manufacture, and with a single gap and stout electrodes), or excessive carbon deposit would also give this trouble. You should remove the cylinder and make sure that the top piston ring is free in its groove and not stuck with carbon, as is frequently the case with two-strokes. As all the alterations in the carburetter adjustment make no difference, it is unlikely that this is causing the trouble, and you would do well to adjust it as it was before the trouble began. You should also make sure that all the ports are free from carbon deposit, and that there is none in the aperture into which the plug screws.

## Avoiding Sideslip.

**Q.** (1.) I have a 1915 5 h.p. Indian, three-speed gear, which I wish to ride for business purposes during the winter. Are there any means by which skidding can be prevented, as I have to ride over both greasy country roads and also the town roads and tramlines? (2.) Does riding with a sidecar spoil the rider or machine for fast solo riding? (3.) Are the articles advertised for keeping the plated parts from rusting a success, and if so, do these dry on hard, or do they have to be renewed every time the machine is cleaned?—D.C.J.

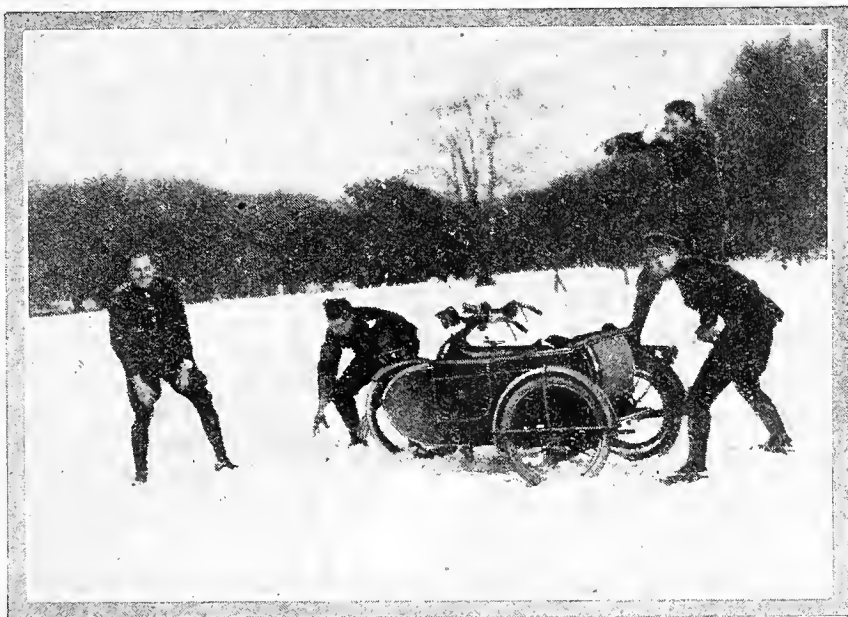
(1.) It is difficult to find a tyre which is equally suitable for both town and country riding. Probably a combination rubber and steel-studded cover would be the best compromise, but even with this you would have to be careful on tramlines. (2.) The fitting of a sidecar is certainly a solution of the difficulty, and if properly fitted and lined up correctly no damage should result. There is no reason why the machine should not be ridden solo afterwards, and it should have no effect upon the driver so far as solo

riding is concerned. (3.) The varnishes made for preventing plated parts rusting are fairly satisfactory, but, being transparent, care should be taken that all parts are covered. The removal when no longer required is rather a tedious job. These varnishes are fairly permanent, but turn yellow after a time. Smearing vaseline over the bright parts is really quite as satisfactory, but requires renewing every time the machine is cleaned.

## Road Matter in Carbon Deposit.

**Q.** (1.) What percentage of the composition of deposit on the cylinder head and piston of the average motor cycle engine is road matter; and (2) carbonised oil? I am of the opinion that about 50% is road matter.—H.K.B.

The proportion of road matter and carbonised oil which go to form the carbon deposit depends entirely on circumstances. It will vary according to whether the machine is ridden over dusty roads or not, and also the brand of lubricating oil used, and so on. It is quite possible that under certain circumstances the deposit might be found to consist of 50% road matter.



## GOOD SPIRITS ARE EVERYTHING!

Everywhere one goes the khaki-clad Britisher unconsciously supplies the answer to the popular phrase, "Are we downhearted?" It is a good omen! The illustration depicts a battle in the snow, the Douglas team winning.

### Thermo-syphon Cooling.

**?** I would be very much obliged if you would give me an explanation to the following: The radiator fitted to my cycle car is honeycombed in design, the engine is 8 h.p. and water-cooled. There are no pipes running through the radiator, and the water circulation apparently goes down the sides. (1.) By what principle is the water supposed to be kept cool? (2.) Is the honeycombed radiator merely for show, or is it meant to act as an air cooler to the engine?—H.L.E.D.

(1.) Unless there is a water circulation pump fitted the system is thermo-syphon; that is, the heated water in the engine rises while the cool water in the bottom of the radiator sinks and takes its place, and so on, so that a natural circulation of the water is continually taking place. (2.) If the radiator is a proper honeycomb radiator the water percolates through tiny channels in the honeycomb so that the air passing through the openings cools it rapidly.

### Winter Clothing.

**?** Will you be good enough to recommend the most suitable clothing for winter wear when driving a sidecar combination?

For bad weather I use oilskins, but dislike them for fine weather. Would a leather vest with sleeves be as good as anything for the body and arms, or would a suit of chamois underwear be a better investment? I propose trying handle-bar muffs, as I find two pairs of gloves are insufficient to keep my hands warm. Reverting to chamois, would chamois pants be strong enough? For my nether limbs I use thick pants, stockings, flannel trousers, and shooting boots, and yet in cold weather I cannot keep warm. I think one needs more protection for one's extremities. I want to keep warm, but do not want to look unsightly or feel uncomfortable when off the machine. I should be very grateful for your opinion of a good outfit for really cold weather.—E.H.H.

A leather vest with sleeves would be an excellent idea, and would keep you very warm. Wear thick riding breeches, long knitted socks, gaiters, and thick boots, and we think you will keep quite warm. Chamois underclothing is also good, but hardly necessary if you are garbed in the manner suggested. We manage to keep our hands adequately warm by wearing woollen inner gloves and leather Asbestol gloves over these. The type of glove which, although not very convenient, certainly keeps the hands the warmest is that in which the fingers are all in one piece, similar to children's gloves. If using ordinary gloves always have them a very easy fit. Of course, if you use handle-bar muffs you may wear quite thin gloves, as they keep the hands warm. A fleece-lined coat reaching to below the knees would also help matters. See article in *The Motor Cycle* of November 18th, page 486.



Giving the youngsters a treat. A three-speed 1913 model Triumph, belonging to Mr. Budd, of Hastings, with a good load in the sidecar.

### Loss of Power.

**?** My machine is a  $3\frac{1}{2}$  h.p. 1913 model, bought second-hand in August, 1915. For about two months it ran perfectly, taking any hill I came to on top gear by opening out the throttle and slightly retarding the ignition. I use it every day, and till about a month ago I used a leather belt, when I got a new rubber one. Now the engine knocks very soon on going up a hill—sometimes a small rise—and on opening out the throttle would stop if I did not reduce the gear very considerably. It does not gather speed as it ought to do when I open the throttle on top gear, but it does better on low. The cylinder and piston have both been cleaned well, the valves ground in, the ignition is all right, and the carburetter has been thoroughly examined too, all quite recently, but I cannot say there is any improvement. The valve springs, I have been told, are all right, too. Do you think my trouble is due to wear, and, if so, what will be the likeliest part to find wrong?—H.J.M.

It is difficult to say what is wrong with your machine without seeing it, especially from the brief details you give. There are many points that would cause a machine to fall off in power as yours has apparently done. If you look to all the following adjustments, and make sure they are all correct, there should be no reason why the machine should give further trouble. One of the chief causes of knocking and bad pulling is carbon deposit. See that the piston and cylinder head are quite clean, and that

the piston rings are free in their grooves and not bound up with deposit. The clearance between the valves and tappets should not be more than  $\frac{1}{2}$  mm. The carburetter should be adjusted so that you should be able materially to improve the running by opening the air, but when giving full throttle an improvement should be effected by slightly closing it. If you are unable to give any air it points to a stopped up jet; if you are able to give full air at all speeds it shows too large a jet. Weak valve springs will also cause bad running. Make sure the plug is not faulty in any way. The silencer outlet should be quite free, otherwise overheating will take place and cause bad running and knocking. Make certain all bearings both in the engine and bicycle are free and not binding. The most likely causes are carbon deposit, stuck rings, wrong valve tappet clearance, or weak valve springs. The machine would, of course, accelerate better on low than high gear. When you have the cylinder off for cleaning purposes you should make sure that the piston and connecting rod are absolutely true and that the piston is running exactly parallel in the cylinder.

### Oil Leakage.

**?** I have a  $3\frac{1}{2}$  h.p. 1912 motor cycle which recently has developed the bad habit of very freely splashing oil out from between the belt pulley and crank case, and also an appreciable amount of oil is blown out through the belt pulley, which is the air release from the crank case. Can you please tell me the best way to overcome these troubles, as at present I am more or less spotted all over with oil after a very short ride, and the machine is always covered?—S.M.T.

The trouble may be due to the crank case release valve being stopped up and not working properly, or to a worn bearing. Possibly the fitting of a felt washer would help matters. With regard to the hollow crankshaft which acts as a release valve, we can only suggest that you plug up the hole and fit a relief valve with a long pipe fitted to it to the crank case.

### RECOMMENDED ROUTES.

BIRMINGHAM TO BRIMS COMBE.—M.L.W.

Birmingham, Alcester, Evesham, Teddington Cross Hands, Cheltenham, Painswick, Stroud, Brimscombe.

BATH TO SWANSEA.—J.P.P.

Bath, Bristol, Pilning Station, train to Severn Tunnel Junction, Newport, Cardiff, Cowbridge, Bridgend, Pyle, Aberavon, Neath, Morriston, Swansea.

STOKE-ON-TRENT TO EDINBURGH.—R.D.W.

Stoke-on-Trent, Sandbach, Northwich, Warrington, Wigan, Preston, Lancaster, Kendal, Penrith, Carlisle, Ecclefechan, Beattock, Moffat, Crook Inn, Broughton, Romano Bridge, Penicuik, Edinburgh.

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# Norton

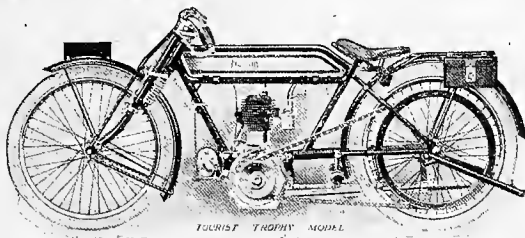
## Ideal for Present Conditions.

### YOU

cannot do better than select a Norton, whether you require a machine for solo-riding or as a passenger vehicle.

The T.T. Model illustrated has a small engine—only  $3\frac{1}{2}$  h.p. 490 c.c.—(which means Economy) yet it forms an ideal combination if used with our light model sidecar.

Remember also this machine holds the sidecar record for Brooklands Hill, the 50 miles Championship of Ireland, and many other honours.



T.T. MODEL

Write for Illustrated Catalogue,  
NORTON MOTORS, LIMITED,  
Sampson Road North, Birmingham.  
London: Bartlett & Co., 74, Gt. Portland Street.

## Buyers! Be Guided

in your choice of a machine by the motives which should influence every patriot at this troubled period of our history.

**STUDY ECONOMY**  
and save money.

**AVOID BUYING  
IMPORTED GOODS**

and keep the money  
you spend in your  
own country.

**BUY A NORTON  
IT'S BRITISH**

## The Food Drink which promotes fitness and efficiency is

# HORLICK'S MALTED MILK

A glass of Horlick's is always the best invigorator. Taken before a ride it will give strength and endurance, and after strenuous exertion there is no better pick-me-up. At all times it gives and maintains fitness and stamina, and is especially useful to men on Active Service.

**SUPERIOR TO TEA, COFFEE, COCOA, AND BEEF EXTRACTS.**

READY IN A MOMENT WITH HOT OR COLD WATER ONLY. NO COOKING.

**Served in Hotels, Cafés, and Railway Refreshment Rooms**

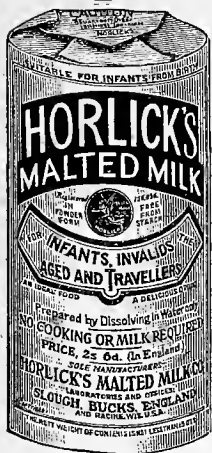
Also available as delicious food tablets to be dissolved in the mouth. Relieve hunger and thirst and prevent fatigue.

Supplied in Sterilised Glass Bottles, at 1/6, 2/6, 11/-, by all Chemists and Stores  
The Tablets also in convenient Pocket Flasks at 6d. and 1/- each.

Liberal sample sent post free for 3d. in stamps.

**HORLICK'S MALTED MILK COMPANY, SLOUGH, BUCKS.**

In answering these advertisements it is desirable to mention "The Motor Cycle."



# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pay carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### A.B.C.

**FOR A.B.C.** and all makes motor cycles, write Morgan and Maxwell, the London Motor Mart, 80, High Rd., Streatham. 150 motor cycles in stock. Lists free. State requirements. [0748]

### A.J.S.

**A.J.S.**, 1916, 2½ h.p., £58.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

**1916 A.J.S.**, 4 h.p., in stock, £76; Millford sidecar to suit, £14.—Cross, Agent, Rotherham. [X8270]

**A.J.S.** Combination, early 1914, 3-speed, kick-start, perfect; £55, or exchange.—16, Longmead Rd., Tooting, S.W. [8175]

**A.J.S.**—1916 models actually in stock at P. J. Evans, John Bright St., Birmingham. 6 h.p. and 4 h.p. solo and combinations, also 2½ h.p. lightweight models. [8121]

**1915 6 h.p. A.J.S.** Combination, absolutely in stock, this luxurious outfit complete only costs £102/10; exchanges, easy terms.—Julian, Broad St., Reading. 'Phone: 1024. [X1485]

**6 h.p. A.J.S.**, 1914, 3-speed countershaft gear and free engine fitted with Gloria sidecar, fitted with Lucas lighting set, Lucas horn, rear light, tools, and spares; any severe trial given; mechanically sound, as new; 70 gns.; rare opportunity.—Wauchope's, 9, Shoe Lane, London. [X8232]

## Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone: 766.

Telegrams: "Perfection."

### NEW 1916 MODELS.

LEVIS, 2½ h.p., 2-stroke	£32 0
LEVIS, 2½ h.p., 2-speed	£47 10
SUNBEAM, 3½ h.p., 3-speed	£75 0
EXCELSIOR (American), 7 h.p., 3 speeds	£73 0
GALTHORPE Minor Sporting 2-seater	£238 gns.
MORGAN, M.A.G. engine, and accessories	£113 13
NEW IMPERIAL, 2½ h.p., 2-speed	£36 15
NEW IMPERIAL, 2½ h.p., variable magneto	£37 18

### DOUGLAS MODELS.—Orders booked now.

We are sole Yorkshire distributors of the American EXCELSIORS. Liberal terms to Yorkshire dealers.

### NEW 1915 MODELS.

*NEW DIAMOND, 2-stroke	£28 13 6
*CONNAUGHT, 2½ h.p., 2-speed	£41 16
*WOLF-J.A.P., 2½ h.p., 2-speed	£37 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed	£33 10
*ROYAL RUBY, 6 h.p., 3-speed	£87 0
*EXCELSIOR, 7 h.p., dynamo lighting, etc.	£71 10

\* Cash offers wanted.

### PERFECTION SIDECARS

to suit American Excelsior and Harley-Davidson machines, 28 x 3 Dunlop tyre, grey coach-built body and chassis ..... £13 10

### SOLO MACHINES.

1914 3½ h.p. Twin LEA-FRANCIS	£46 10
1913 3½ h.p. ROVER, 3 speeds	£37 10
1913 3½ h.p. ROVER, Grado gear	£27 10
1913 3½ h.p. RUDGE Multi	£24 10
1912 3½ h.p. RUDGE Multi	£27 10
1912 3½ h.p. 2-speed RUDGE	£24 10
1912 3½ h.p. 2-speed F.E. BRADBURY	£29 10
1912 2-sp. SCOTT, specially good	£31 10
N.S.U., 3½ h.p., 2-speed, spring forks	£19 19
EXCELSIOR, 3½ h.p., 3-speed, Druid forks	£19 19
2½ h.p. 2-speed DOUGLAS	£24 10
8 h.p. 3-speed CHATER-LEA	£23 10
1910 3½ h.p. Tourist TRIUMPH	£22 10
KERRY, 3 h.p., magneto, Saxon forks	£12 10
5½ h.p. Magneto REX, spring forks	£12 10
M.M.G., 3 h.p., magneto	£11 10
N.S.U., 1½ h.p., 2-speed, spring forks	£15 10
REX, 3½ h.p., magneto, spring forks	£14 10
DOUGLAS, 2½ h.p., Twin, spring forks	£16 10
SCOTT, W.C., 2-speed, chain drive	£22 10
TRIUMPH, 3½ h.p., specially good	£19 10

### £145 RITZ LIGHT CAR. £145

The last word in light car values; 10 h.p. 4-cylinder, mechanical lubrication, electric horn and lighting, hood, screen, tools; luxuriously sprung, and a grand top gear car. Deliveries from stock. Trial runs by appointment. Exchange liberally catered for.

### SIDECAR COMBINATIONS.

New 1914-15 6 h.p. REX Sidette	£69 10
1914 6 h.p. REX Sidette, almost as new	£57 10
W.C. WILLIAMSON and Sidcar (new)	£89 15
1913 REX Coach Sidette, speedometer, etc.	£44 10
1912 3½ h.p. 2-speed Twin PREMIER and smart coach-built Sidcar	£34 10
1913 6 h.p. 2-speed F.E. REX, chain drive, smart coach Sidcar	£43 10
1913 RUDGE Multi and Sidcar	£38 10
1912 RUDGE, 3½ h.p., 2-speed, and Sidcar	£29 10
1912 RUDGE Multi and Sidcar	£34 10
ROVER, 3½ h.p., 3-speed Combination	£43 10
1912 6 h.p. 2-speed REX and Sidcar	£34 10
1911 3½ h.p. N.S.U., 2 speeds and Sidcar	£19 19
1910 3½ h.p. 2-speed REX and Sidcar	£24 10
6 h.p. 2-speed V.S. and Sidcar	£23 10
Brand New 6 h.p. 2-speed REX Sidette	£69 10

### MISCELLANEOUS.

New 1916 MORGAN, M.A.G. engine	£113 13
MORGAN, 1914, Sporting, hood, screen, etc.	£79 10
MORGAN, Standard, hood, screen, and speedometer	£59 10
New 1916 5-seater OVERLAND	£275 0

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**1915 2½ h.p. A.J.S.**, 3-speed, all chain drive (enclosed), excellent condition, 2 lamps, 2 generators, tools, etc.; £47, or near offer; seen by appointment.—Barrett, 142, Denmark Hill, S.E. [X7541]

### Alldays.

**ALLDAYS** Matchless, 1914, 2-stroke, perfect condition; £18.—Hilder, Reginald Rd., Bexhill. [8149]

**1915 Allon**, 2 speeds, lamps, horn, speedometer, nearly new; £35.—1, Pilgrim Hill, West Norwood. [8083]

**NEW Allons**, 2-speed models £42, single-speed models £34; delivery from stock; cash or extended payments.—Wauchope's, 9, Shoe Lane, London. [X8233]

**ALLON**, 1915, 2½ h.p., 2-stroke, fitted new crankshaft, flywheel, connecting rod bearings at a cost of £5, and completely overhauled, in fine condition; £27, or offers; must sell.—S.J., 56, The Grove, Ealing. [8030]

### Ariel.

**ARIEL** 5-6 h.p. Combination; £93/10; actually in stock; generous deferred payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8183]

### Arno.

**SMART** Arno Combination, 1914, 3½ h.p., 3-speed, cane sidecar, well upholstered, lamp, horn, Spray; 38 gns.—Railway Garage, Staines. [8228]

### Auto-Wheels.

**AUTO-WHEEL**, with or without lady's 3-speed Raleigh, all in first-class condition; £15, complete.—W. Vaisey, 61, Leeming St., Mansfield. [X8194]

**AUTO** Wheel, attached to 3-speed Fleetwood cycle, ready for the road; £12/10; excellent condition; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X8234]

### Bat.

**BAT-J.A.P.**, 1914½, 5-6 h.p., chain-cum-belt, sporty model, 3 speeds and free countershaft, as new; £45. Write first—"Bat," 18, Beechwood Av., Thornton Heath. [0754]

**1912 Bat-Jap**, 4 h.p., P. and M. 2-speed, in excellent condition, full kit; £23.—Tuke and Bell, Ltd., Motor Department, Carlton Engineering Works, High Rd., Tottenham. [8065]

**BAT-J.A.P.**, 8 h.p., late 1915, 3-speed, spring frame, only ridden 1,500 miles, mostly solo, new Henderson quickly detachable coachbuilt sidecar, £16/16 model, only done 200 miles, the whole outfit absolutely as new, with all accessories; cost £105; one of the best and smartest propositions on the road; sacrifice for £80; practically a 1916 combination at second-hand price.—Kitchen, 71, Ashland Rd., Sheffield. [X8269]

**BATS**—The very latest up-to-date combinations supplied from stock; 6 h.p. twins and 4 h.p. solo twins, immediate delivery, with or without Bat sidecars. Also we have for sale a 1915 second-hand 8 h.p. combination, fitted with handsome underslung sidecar, 3-speed countershaft gear, includes speedometer and all high-class accessories; price £65, guaranteed.—Sole wholesale London agents, Wauchope's, 9, Shoe Lane, London. [X8235]

### Bradbury.

**BRADBURY**, 4 h.p., 1912, free engine, with accessories.—44, West Side, Wandsworth Common. [8041]

**2½ h.p. Bradbury**, modernised, low position, carrier, 4 Hellesen; £5/10.—Barlow, Plumber, Manton, Manchester. [X8088]



# THIS GROUP SHOULD INTEREST YOU.

## IN STOCK.

G.P. MORGAN, w.-c. ....	£111 6
2½ h.p. A.J.S., 3-speed, kick starter ....	£58 0
4½ h.p. JAMES Combination ....	£30 10
3½ h.p. T.T. ROVER, Philipson pulley ....	£56 0
ROVER Combination ....	£34 7
2½ h.p. all black T.T. DOUGLAS ....	£54 12
3 h.p. ROYAL ENFIELD, twin, T.T. 2-sp ....	£52 10

## TWO-STROKES.

T.T. SPARKBROOK ....	£37 16
T.T. IXION ....	£28 10
JAMES, 2-speed ....	£33 10
Lady's METRO, 2-speed ....	£33 10
IVY, single-gear ....	£23 10
ROYAL RUBY ....	£29 10
HOBBART, 2-speed ....	£33 10
SPARKBROOK, 2-speed ....	£37 16
EXCELSIOR, single-gear ....	£30 16
METRO, sporting model ....	£23 10
LEVIS, 2-speed ....	£24 0
IXION ....	£28 10

## SECOND-HAND MACHINES, OVERHAULED.

1914 3½ h.p. T.T. SINGER, lamp and horn ....	£38 0
1914 2½ h.p. T.T. DOUGLAS, lamp and horn ....	£38 0
1915 5 h.p. T.T. INDIAN, 3-sp., like new, complete ....	£62 0
1915 4-5 h.p. Clutch ZENITH, complete with Canoelet Sporting Sidecar, practically new ....	£70 0
1915 IXION, 2-stroke, nearly new ....	£26 0
1914 IXION, 2-stroke ....	£22 0
1911 T.T. TRIUMPH, just renovated ....	£25 0
1910 F.E. TRIUMPH ....	£25 0
1914 3 h.p. ENFIELD, T.T., 2-speed ....	£36 0
1913 TRIUMPH, 3-sp., and coach-built Sidecar ....	£48 0
1915 3-sp. 2½ h.p. DOUGLAS, like new, lamp and horn ....	£46 0
1913 6 h.p. REX, F.E., fine order ....	£25 0
1911 2½ h.p. ROYAL ENFIELD, twin, magneto, etc., splendid order ....	£13 0
1916 SCRIPPS - BOOTH, 13.2 h.p., 2-seater, yellow and black finish, absolutely like new, only done 400 miles ....	£250 0
LUCAS 341 Lamp Sets ....	£2 2 0
STEWART SPEEDOMETERS, from stock ....	£2 10 0
JUNIOR LONG HORNS, from stock ....	£1 5 0
F.R.S. LAMPS, big sets ....	£3 8 8
F.R.S. LAMPS, major sets ....	£3 18 6
F.R.S. LAMPS, Douglas sets, from stock ....	£2 0 0

**WE STOCK  
AND  
RECOMMEND  
PEDLEY  
BELTS**

**The North Wales  
Motor Exchange,  
HOLT STREET, WREXHAM.**

Telephone: 283.  
Telegrams: "Motor Exchange, Wrexham."

## MOTOR CYCLES FOR SALE.

### Humber.

3½ h.p. 1914 Humber, 3-speed, torpedo sidecar, all accessories; £50; cash or easy terms.—B. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0724]

3½ h.p. 1914 Humber, 3-speed, hest Bramble sidecar, with hood and apron, Lucas lamp, Jones speedometer, and all spares; £50; good bargain.—Clenston, Albion, St. George's, Wellington, Salop. [X8216]

NEW from Works November last, 6 h.p. water-cooled vibrationless horizontal twin Humber and sidecar, hood and screen, every accessory; owner enlisting; cost £118, will accept £98 for quick sale.—S. N. Band, 37, Billing Rd., Northampton. [X8073]

### Indian.

5 h.p. Indian, 3-speed, Bramble coachbuilt sidecar to match; £70.—Parker and Son, St. Ives, Hunts. [8247]

LATE Indian, 7 h.p. clutch model, all accessories, very fast; bargain, £26, or nearest.—Pooley, 1, Wastdale Rd., Forest Hill. [8186]

5 h.p. Indian, 1915½, and sidecar, not done 500 miles; cost £90; owner enlisted; £63; like new.—Lewin, 22, Wadcroft, Kettering. [X8284]

INDIAN, 1912, road racer, 5 h.p., just overhauled, good condition, English controls; photo; £24.—77, Mayfield Av., Dover. [8112]

INDIAN, T.T. racing model, 2-speed, absolutely like new, very fast, lamps, etc.; £45.—28, Ellery St., Fulham Palace Rd., Fulham. Tel.: 531 Putney. [8169]

7 h.p. 1914 Indian and Coachbuilt, handsome turnout, disc sidecar wheel, electric set, ready for the road; £65, guaranteed.—Wauchope's, 9, Shoe Lane, London. [X8314]

1915 Indian, 5 h.p., 3-speed, new tyres, specially fitted in beautiful condition; 44 gns.—Julian, Central Garage, Broad St., Reading. 'Phone: 1024. [X7637]

INDIAN 1914 7-9 h.p. Combination, 2-speed, hand clutch, kick start, done 1,800 miles, £58; 26 x 2½ tyre and tube, £1.—25, Hermitage Lane, Childs Hill. [8185]

INDIAN Power Plus models F and G, actually in stock; £20 and £75 respectively; liberal easy payments; exchanges.—Lamb's, 151, High St., Walthamstow. [8180]

INDIAN, 7-9 h.p., 1914, with Swan sidecar, splendid outfit, in new condition, £50; also 1915 Indian, solo, £50.—Carish, Ltd., 314, Euston Rd., N.W. 'Phone: Museum 3146. [8087]

1915 7 h.p. T.T. Clutch Indian, red, C.B. streamline sidecar, exceptionally fast machine, as new, accessories; must sell; £55, bargain.—Hawkes, 43, Monford, Bedford Park, W. [8010]

INDIANS, 1916 models, in stock, B, C, D, and F ready to drive away; early delivery of 2-stroke 2-speeder; a few road racers left at £65.—P. J. Evans, 87-91, John Bright St., Birmingham. [8113]

INDIAN, 7 h.p., 1915, 3-speed, and clutch, with kick starter, only covered a few hundred miles, guaranteed perfect; must sell immediately; £55, or nearest offer.—Lieut. A. Shaw, Bisset's Hotel, Gullane, Haddingtonshire. [8047]

INDIANS, second-hand, guaranteed properly overhauled; 1915 7 h.p. 3-speed combination £75, 1914 7 h.p. 2 speeds £48, both complete electric lamps, horn, and speedometer.—P. J. Evans, John Bright St., Birmingham. [8126]

1916 7 h.p. Indian, spring frame, 3-speed, electric lighting, speedometer, etc., absolutely in stock. £78. 1916 5 h.p. 3-speed model in stock, the solo or sidecar machine, £70.—Julian, Broad St., Reading. 'Phone: 1024. [X3145]

1914 Indian, 7-9 h.p., electric starter, 2-speed, clutch, foot control, T.T. bars, spring frame, 28 x 3 Kempshall tyres, B220 saddle, Lucas 341 lamp, electric tail lamp, Corbin-Brown speedometer; £42/10.—Robinson's Garage, Green St., Cambridge. [6865]

1915 7-9 h.p. Indian, T.T. model, with clutch, all accessories, including lamp and horn, machine in perfect condition, bargain, £50; also Indian sporting model sidecar to suit above machine, excellent condition, £10.—9,840, c/o The Motor Cycle. [X8087]

CHEAPEST Bargain ever offered.—7-9 h.p. Indian combination, 1914, not used till 1915, De Luxe coachbuilt sidecar, 2-speed, kick starter, electric lighting, and electric horn; quick sale £50, no offers; any trial here; owner enlisted.—H. Millard, Eiger House, Chesterfield. [X8218]

1914½ Hendee Special, with Millford coachbuilt sidecar, luggage grid, and tool locker, dynamo electric lighting and starting, X'Pall saddle, extra set of chains and inner tube, and numerous spare parts, in splendid condition, and ready to go anywhere; £65; book of instructions.—Dr. Saunders, 9, Moorfield Rd., Portland. [X8316]

### Ixlor.

1914 2½ h.p. Ixion, 2-stroke, lamps, horn, and spares, new belt and Dunlop tyre, over 100 m.p.g.; £20.—Hancock, 43, Hill St., Hinchley. [X8286]

### James.

1916 4½ h.p. James Combination; £30.—Parker and Son, St. Ives, Hunts. [8245]

1916 4½ h.p. 3-speed Countershaft James; 63 gns.—Parker and Son, St. Ives, Hunts. [8244]

## EXCHANGES are our SPECIALITY.

Let us know your requirements.

The following are all actually in stock.

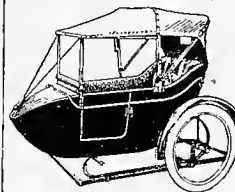
1916 SPORTING MORGAN, all on	£109 0
1916 6 h.p. NEW HUDSON ....	72 gns.
1916 FORD Chassis, 20 h.p. ....	£115 0
1916 FORD Van, 20 h.p. ....	£130 0
1916 20 h.p. FORD Ambulance	£135 0
1916 6 h.p. ENFIELD Combination	85 gns.
1916 6 h.p. J. H. Combination ....	90 gns.
1916 5-6 h.p. EXCELSIOR, Sturmeys countershaft 3-speed gear	68 gns.
1916 4½ h.p. EXCELSIOR, Sturmeys countershaft 3-speed gear	64 gns.
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels; all on	£120 0

## SECOND-HAND BARGAINS.

1915 6 h.p. ENFIELD Combination, Lucas dynamo lighting, 3 lamps, speedometer, etc. ....	£30 0
1915 2-sp. 2-str. NEW HUDSON, done 500	28 gns.
1915 B.S.A. Combination, all chain drive	£63 0
3½ h.p. 1909 REX de Luxe, 2-sp., handle st'g	£19 0
6 h.p. ZENITH, clutch model and Sidecar	£40 0

# FARLOW SIDECARS.

Built throughout in our own factory. Farlow Sidecars have that pleasing style, exquisite finish, and lasting qualities which are the buyer's ideal.

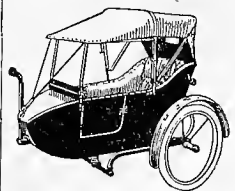


MODEL 3.

Underslung chassis with Luggage Carrier combined.

Splendidly made and built for hard work.  
£10 15 0

Hood £2. Screen £1.



This is MODEL No. 7  
A BEAUTIFUL LIGHT  
SIDECAR.

PRICE 9 Guineas.

Hood £2. Screen £1.

Delivery from Stock.

Your Agent will supply



## NEW MOTOR CYCLE FRAMES.

Fully Guaranteed.

25/- each.

## ODD BARGAINS.

F.R.S. lamp set, 500 beam, shop-soiled ....	35/-
F.R.S. lamp set, 1,000 beam, shop-soiled ..	45/-
New Clincher Clearance Covers De Luxe, "heavy" rubber studded, 26 x 2½, 26 x 2½, and 26 x 2½ .....	25/- each.
Latest mechanical horn, black and nickel	£1
Cowey Speedometer for 26 x 2½ wheel ....	£2
Cowey Speedometer for Morgan .....	£2 5
set of Millers Cycle Car Lamps and Generator, new .....	£3
5 h.p. J.A.P. Air-cooled Eng., fine condition	12 gns.
Lukin Cycle Car Carburettor, new condition	15/-
Cox Cycle Car Carburettor .....	10/-
Spare Belt Carrier .....	3/6
Bosch Magneto, single-cylinder, new .....	£5 0
Bosch Magneto, twin-cylinder, new .....	£5 10

## FARRAR'S MOTORS

(Telephone 919),  
Hopwood Lane, HALIFAX.

## MOTOR CYCLES FOR SALE.

## James.

1915 James 3½ h.p. Twin, had little use, P. and H. lamp, Jones speedometer and horn; £54.—Walter John, Glasfryn, Llanelly, Carm. [X8146]

1915 James Coach Combination, 4½ h.p., sidecar (1915), 2-speed countershaft, lamps, etc., any trial; £45, offer.—Holmes, Hawthorn, Belmont Rd., Hereford. [X8138]

JAMES, 1916 models in stock for immediate delivery; 4½ h.p. coachbuilt combinations, with and without Lucas lighting set, also lightweight models.—P. J. Evans, John Bright St., Birmingham. [8120]

JAMES, 1915, 4½ h.p., 3-speed countershaft gear, clutch and kick starter, chain drive, Canelec sidecar, with Lucas electric lighting outfit, Lucas electric horn; £90/15.—Colmore Depot, 261, Deansgate, Manchester. [0674]

## J.A.P.

J.A.P., 4 h.p., sidecar, clutch, Bosch, Amac, powerful, reliable mount; £15, lowest.—348, Eccles New Rd., Salford. [X8216]

## Kerry.

KERRY-ABINGDON, 3½ h.p., 1912, clutch, speedometer, lamps, etc., excellent condition; £20.—Myland and Co., 197, London Rd., W. Croydon. [8192]

24 h.p. Kerry Engine, just overhauled, B. and B. carburettor new, Bosch mag. new, frame, wheels, tank, oil pump; bargain, £8.—Baxter, Westerham, Kent. [8140]

## King Dick.

1915 4 h.p. King Dick, Grado pulley, new tank, good condition; £25.—Drewry, Scotton, Gainsborough. [X8188]

## Lea-Francis.

LEA-FRANCIS, late 1914, 3½ h.p., 2-speed, hand and foot clutch, Lucas lamp and horn, Smith's trip cyclometer, rear lamp, just overhauled by makers, condition as new; £52.—Lieut. Waiter, 133, Sloane St., London, S.W. [X8077]

## Levis.

LEVIS, 1915, 2½ h.p. Popular, in first-class order, fast machine; £25.—McKinnon, Wallington. [X8274]

BROOK, Motor Cycle Specialist, Burnham, Som., can supply Levises from stock. Write for lists and terms. [8157]

LEVIS, 1914, 2½ h.p., footboards, sight feed lubrication, mag. control, fully equipped; offers over £21.—Box L361, c/o The Motor Cycle. [8235]

LEVIS, 1915, Lucas lamp set, had little use; owner enlisting; bargain, £22.—Lovekin, Lindum Cottage, Holyhead Rd., Okegate. [X8217]

1915 Levis, 2½ h.p., Popular model, absolutely in stock; £28/1; exchanges; easy terms.—Julian, Broad St., Reading. 'Phone: 1024. [X6410]

LEVIS, latest Popular model, just arrived from works; immediate delivery; £28/1.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7947]

1915 Levis Popular, lamps, horn, accessories, new belt, grand condition, little used; owner called up under Derby scheme; £24; seen Saturday, 8th January.—60, Barrington Rd., Brixton, S.W. [X8072]

LEVIS 2-stroke Motor Cycles, latest 1915 models.—Sole London and district agents, Cars and Motor Sandries, Ltd., 175-177, Shaftesbury Av., London, W.C. 'Phone: 1432 Regent. [0711]

LATE 1914 No. 1 Levis, 2½ h.p., single gear, good tyres and belt, fitted lamps, etc., guaranteed excellent condition throughout; £28, or near; cost £41.—Waltos, Dawson Sq., Burnley. [X8091]

LEVIS, 2½ h.p., 3 speeds, and clutch, done 3,000 miles, going equal to new, appearance almost equal to new, many extras and improvements; can be seen and tried in Cheshire; lowest price £25.—Box L383, c/o The Motor Cycle. [8242]

## Matchless

MATCHLESS, 1912, and sidecar, good order, lamps, horn, and tools; £38.—50, Clapham Rd., S.W. [8086]

1913 7 h.p. Matchless, Canelec sidecar, all accessories, £55, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0721]

MATCHLESS, 1913, 8 h.p. J.A.P., 2-speed, Millford coachbuilt sidecar, lamps, etc., bargain, quick sale £36.—Box 9,856, c/o The Motor Cycle. [X8290]

MATCHLESS, 1913, 8 h.p. J.A.P. engine, overhead valves, 2-speed, F.E., underslung coachbuilt sidecar, electric horn, etc.; £70; exchange Enfield combination.—160, Boundary Rd., Walthamstow. [8198]

MATCHLESS 1913 Motor Cycle and Sidecar, 6 h.p., 3-speed, in perfect condition, with all accessories, including spare tyre and inner tube, also portable shed; £55, complete.—Apply, Al Palo, Bramhall Lane, Stockport. [X8295]

MATCHLESS, 1915, 7 h.p. M.A.G. engine, 3 speeds, coachbuilt sidecar, with adjustable wind screen, loggare carrier, lamps, horn, as good as new; £82/10.—Cass's Motor Mart, 5, Warren St., Euston Rd., W. Maccam 623. [8055]

## Metro.

METRO Sporting Model, late 1915, 2½ h.p., not ridden 400 miles, complete accessories; sacrifice, £22.—16, Binsley Lane, Oxford. [X8336]

## Minerva.

MINERVA, 4½ h.p. twin, low frame, lamp, horn; £20; coll.-ed.—T. Wallace, Hailes, Haddington. [X8165]

# MODELS OF PERFECTION

and actually in stock:

Model G. 7 h.p. TWIN INDIAN, rigid frame, 3-speed gear - £75 0

Model F. 7 h.p. TWIN INDIAN, spring frame, 3-speed gear, rear drive speedometer, Splitdorf ignition-lighting outfit - £90 0

Model B. 5 h.p. TWIN INDIAN, 3-speed gear - £70 0

Model C. 7 h.p. TWIN INDIAN, 3-speed gear, electrically equipped, kick starter and speedometer - £78 0

Model D. 7 h.p. TWIN INDIAN, road racer, single speed and clutch - £65 0

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## MOTOR CYCLES FOR SALE.

## Minerva.

MINERVA Twin, 4½ h.p., without ignition; best offers.—E., 69, Hamlet Gardens, Hammersmith. [8057]

## Moto-Reve.

MOTO-REVE Twin Lightweight, mar. B. and R., Druids; seen running; bargain, £9/10.—A. Speechley, 45, Church Rd., Acton. [8239]

## Motosacoche.

2½ h.p. Moto-sacoche, 1914, all accessories; £20.—22, Goring, 308, St. Paul's Rd., Highbury. [X8168]

## New Hudson.

NEW Hudson, 1915, 2½ h.p., 2-stroke, 2-speed, De Luxe model, speedometer, horn, lamps; £27.—Box 9,550, c/o The Motor Cycle. [X8175]

1915 New Hudson, 2-stroke, new August, 2-speed, 2 lamps, horn, only done about 400 miles, perfect condition; £32/10.—Day, Etchington Park Rd., Finchley. [8024]

NEW Hudson 1913 4 h.p. 3-speed Combination, very fine condition; £34; exchange modern 2-speed lightweight, Douglas preferred.—Elliot, 226, Porttany Rd., South Norwood. [8200]

23 h.p. New Hudson, late 1912, Armstrong 3-speed clutch, pedal starting, would take light sidecar, hardly used, perfect; any trial; suit lady; £25.—154, Verdaat Lane, Catford. [8082]

1915 2½ h.p. New Hudson, with new heavy Dunlop back tyre, in very good condition, and splendid running order; 23 gns., great bargain.—Julian, Central Garage, Broad St., Reading. 'Phone: 1024. [X8328]

NEW Hudson, Big Six and 4 h.p. combination, actually in stock; £92/8 and £79/15 respectively; liberal exchanges and deferred payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8182]

## Newey.

NEWHEY-OLIMAX, 2½ h.p., 2-stroke, Enfield 2-speed gear, chain-cum-belt drive, 26x2½ Hutchinson rubber-studded tyres as new, open frame, had very little use; £20.—The Premier Motor Co., Aston Rd., Birmingham. [8161]

## New Imperial.

NEW Imperial-Jap, 1915, 2½ h.p., 2-speed, shop-soiled; 30 gns.—Julian, Broad St., Reading. 'Phone: 1024. [X6408]

NEW Imperial-Jap, 2½ h.p., 2-speed, 1915½, new August; enlisted; £27/10.—Masoa, 89, Oxford Rd., Acocks Green. [X8321]

NEW Imperials, delivery 1916 models from stock; prices from 35 gns.—P. J. Evans, John Bright St., Birmingham. [8117]

NEW Imperial-Jap, both models in stock, with and without clutch and kick starter, £36/15 and £45/1.—Crow Bros., 190, High St., Guildford. [7725]

NEW Imperials, 1916 models, in stock; sole London agents; trade supplied; few 1915 shop-soiled at reduced prices.—A. P. Rey, 173, Gt. Portland St., London, W. [7882]

IMPERIAL J.A.P., light tourist, 2½ h.p., Dunlops, 2-speed, latest model; £36/15; just arrived; immediate delivery.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7948]

23 h.p. New Imperial-Japs, latest models, just delivered, 2-speed and free engine, an ideal lightweight; £36/15; cash, extended payments, or exchange.—Wauchope's, 9, Shoe Lane, London. [X8242]

NEW Imperial-Jap, 3½ h.p., 1915, 3-speed countershaft, clutch, kick start, only 3 months old, mileage 1,800, complete with lamps, horn, speedometer; £48; cheaper machine considered in part.—Varty, Thundersley, Essex. [8196]

## Norton.

1916 3½ h.p. 3-speed Norton, countershaft, 62 gns.; also several 3-speed 1914 Nortons in stock, £43.—Parker and Son, St. Ives, Hunts. [8246]

NORTONS, 1916 models in stock; Brooklands road special, T.T. model, sporting countershaft, and De Luxe combinations.—P. J. Evans, John Bright St., Birmingham. [8116]

Birmingham, Norton, 1916 model, with sidecar, 3-speed countershaft gear, kick start, fast, as new; £67/10; satisfactory reason for selling explained.—Seen at Wauchope's, 9, Shoe Lane, London, E.C. [X8252]

## N.S.U.

3½ h.p. N.S.U., sidecar, 2-speed; bargain, £13.—32, Johnson, 6, Martin's Rd., Bromley, Kent. [8131]

N.S.U., 3½ h.p., side entrance, wicker sidecar, 2 speeds, F.E., mag.; seen running; great bargain, £14/10, near offer.—45, Church Rd., Acton. [8240]

1911 3 h.p. N.S.U., 2-speed, free engine, Druid forks, Terry spring forks, Scenspray, perfect throughout; £18, nett cash.—47, Harehills Lane, Leeds. [8045]

N.S.U. Motor Cycle and Sidecar, modern 6 h.p., twin-cyl., 2-speed, F.E., perfect condition; £34.—View, etc., H.A., 2, Clarence Rd., Brondesbury, N.W. [8068]

N.S.U., 4 h.p., new cylinder and valves and piston, just re-bushed by makers, tyres perfect, everything in good order, splendid hill-climber; owner bought twin; £22, or no reasonable offer refused.—Griffith, 6, Gipsy Hill, S.E. Tel.: Sydenham 1056. [8191]

## MOTOR CYCLES FOR SALE.

## O.K.

O.K., 1914, 2-speed; £20, or near offer.—Harrig, Greatham, Hants. [8018]

O.K.-PRECISION, 3½ h.p., 2-speed, F.E. and sidecar, Amiac carburetter, all accessories; £35.—56, Morville St., Bow E. [8167]

O.K., 1915, 2½ h.p., 2-speed, J.A.P. engine, splendid condition, spare Clincher tyre; £25.—Jelley, Post Office, Goshall, Surrey. [X8255]

O.K. Junior, 1915, 2-speed, in splendid condition, very little used; original price £35/10, to be cleared at 21 pns. very great bargain.—Julian, Broad St., Reading. Phone: 1024. [X2346]

## P. and M.

1909 P. and M., good condition; £15, or offer.—Varvell, Crocker Hill, Kent. [8105]

P. and M., 1914, 2-speed, kick starter, speedometer, Lucas lamp, new coachbuilt sidecar; £50.—Parkstone, Combe Rd., New Malden. [8165]

## Peugeot.

PEUGEOT, 1914, perfect, done only 600 miles, all accessories, tools—38, Grafton Rd., Bedford. [8034]

## Precision.

1914 3½ h.p. Precision, wicker sidecar, Bosch, B.B. spring forks, splendid condition, accessories; nearest £18, bargain—123, Boud St., Macclesfield. [X8225]

1915 Precision-Martin, 2½ h.p., 2 speeds, free engine, foot plates horn, head lamps, generator, splined condition; bargain, £18/10.—4, Anton Rd., Dover. [8139]

## Premier.

1913 Premier, 3½ h.p., T.T., very fast; £25.—Knight, West St., Alresford, Hants. [X8205]

PREMIER, 3½ h.p., clutch hub, and wicker sidecar; £28.—Fallick, Aldingbourne, Chichester. [X8228]

3½ h.p. Premier, 3 speeds, as good as new; £30, with P.H. lamp and horn.—The Garage, Whitland, S. Wales. [X8149]

1912 3½ h.p. Premier Combination, fast, reliable lamps, horn, tyres fair; £23.—C. Franklin, Swinford, Eryasham, Oxon. [X8170]

PREMIER, 1913, 3½ h.p., 3 speeds, Canelet de Luxe sidecar, perfect condition; bargain, £38.—Phillips, 8, Grand Parade, Haringay. [8226]

3½ h.p. Premier, 2 speeds, free engine, all accessories, 2 with wicker sidecar, excellent condition; £40.—Stinson, Widdicombe, Beckenham. [8141]

3½ h.p. Premier, 3-speed, 1913, with Canelet sidecar, Stewart speedometer, splendid running order; £42 cash.—Scott, Ironmonger, Hawkhurst. [X8267]

PREMIER, good serviceable machine, just thoroughly overhauled, lamps, horn, generator, brand new tyres and inners; £22/10.—Letts, H. Co., Royal Military College, Camberley. [8147]

1911 3½ h.p. Premier, clutch model, and W.S., in splendid going order, for more modern machine or combination, cash adjustment.—River View, Point Pleasant, Wandsworth. [8215]

1913 3½ h.p. Premier Combination, 2-speed counter, shaft gear, clutch, coachbuilt sidecar, 4-point attachment, 8in. head light, Lucas rear, and sidecar lamps, spare belt, tube, new Palmer tyre, tools, etc.; £43.—F. R. Norris, Talbot, Mere, Wilts. [8029]

## Quadrant.

QUADRANT, 2½ h.p., good working order; cheap; £12.—Wines, Midsomer Norton, Bath. [X8317]

3½ h.p. Quadrant, fitted with variable gear, sound condition; £20; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X8245]

4½ h.p. Quadrants, latest new 1916 models, chain-cum-belt transmission, B.S.A. 3-speed gear, free engine, and kick start; delivery from stock; price £60; exchange or easy terms.—Wauchope's, 9, Shoe Lane, London. [X8244]

## Radco.

RADCO Lightweight, 1915 model, nice condition; £20, complete with accessories and tools.—Wauchope's, 9, Shoe Lane, London. [X8315]

## Rex.

6 h.p. 1910 Rex and Sidecar; £15/15, or exchange anything useful.—King, 43, Royston Av., Bentley Rd., Doncaster. [8190]

REX, 1912, 6 h.p., 2 speeds, Philipson pulley, 3 lamps, sidecar, nearly new tyres; £25.—Plumers, Baker St., Enfield. [X8277]

3½ h.p. Rex, Saxons, Splitters, Binks, good running order; £14, or nearest offer.—E. Stemberge, Breachwood, Welwyn, Herts. [X8201]

1912 6 h.p. Twin Rex and sidecar, just been re-namelled, and thoroughly re-built, as new; £40.—C.C.R. Motor Works, St. Ann's Well Rd., Nottingham. [X8211]

6 h.p. Twin Rex Combination, motor cycle and sidecar, done about 5,000 miles, in perfect condition throughout, all accessories, 2-speed, with clutch, tyres all in good condition; £50, or near offer. Oakley, Ltd., 85, Regency St., London, S.W. [0755]

## Rover.

ROVER, 3½ h.p., 1914, 3-speed, sporting sidecar, speedometer, all accessories; £49.—Bear Hotel, Esher. [X8193]

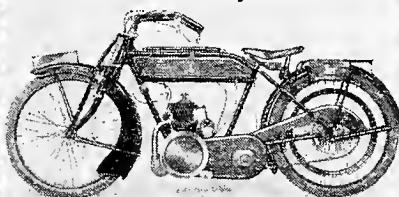
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8 h.p. British EXCELSIOR, 3-speed ..... £78 15 0  
2½ h.p. ALLONS, 2-speed ..... £42 0 0  
6 h.p. ENFIELD Combination ..... £89 5 0  
2½ h.p. CALTHORPE-J.A.P., 2-speed ..... £37 16 0

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1915 2½ h.p. CALTHORPE, 2-stroke, 2-sp., variable ignition	32 10	29 10 0
1915 2½ h.p. EXCELSIOR, 2-stroke, shop-soiled	36 16	28 10 0
1915 5-6 h.p. EXCELSIOR, 3-speed, countershaft	71 8	66 10 0
MILLFORD Empress for H.D. machines, new, latest model	—	18 15 0
ROVER Coach-built Sidecar, with brake, shop-soiled	17 17	15 15 0

## SECOND-HAND BARGAINS.

1915 4 h.p. A.J.S. Combination, fine order ..... £80 0 0  
1914 6 h.p. A.J.S. and Canelet, hood and screen ..... £70 0 0  
Quadrant 2-speed and AUTO-WHEEL, nearly new ..... £12 0 0  
1915 3½ h.p. lady's BROUGH, 3-speed, nearly new, fully equipped ..... £53 0 0  
1914 2-stroke LEVIS, 2-speed, fully equipped ..... £32 10 0  
1915 8 h.p. MORGAN, cost £105, splendid condition ..... £88 10 0  
1915 4-5 h.p. ZENITH, countershaft, nearly new ..... £48 10 0  
1913 6 h.p. ZENITH and Coach-built Sidecar ..... £42 0 0  
1914 8 h.p. ZENITH, countershaft, and Bramble coach Sidecar ..... £65 0 0  
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## MOTOR CYCLES FOR SALE.

## Rover.

ROVER, 1914, 3½ h.p., 3-speed, and clutch; bargain, £38; owner gone abroad.—80, Santos Rd., East Putney. [8054]

ROVER, late 1914, 3½ h.p., 3-speed, clutch, all accessories; any trial, examination; as new.—Box 9,839, c/o The Motor Cycle. [X8074]

ROVER, 1916 models in stock; immediate delivery R.T.T. models, with or without Philipson.—P. J. Evans, John Bright St., Birmingham. [8122]

ROVER, 1912, 3½ h.p., free engine, kick-starter, L. Cowey speedometer; good condition; £26.—The Premier Motor Co., Aston Rd., Birmingham. [8160]

ROVER, 1915, T.T., 3½ h.p., handle-bar controlled, Philipson pulley; we have two of these splendid machines in stock, brand new; £55 each; exchanges or extended terms.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

## Rudge

RUDGE Multi, 1915½, complete, new, run 50 miles; cost £65, accept £50.—11, Stanhope Terrace, Hyde Park. [X8297]

1913 Rudge Multi, 3½ h.p., clutch, good condition; £29.—Gibson, 7, Warrender Park Terrace, Edinburgh. [8019]

ISLE of Man T.T. Rudge Multi, 3½ h.p., 1915, lamps, etc.—448.—Morgan and Maxwell, 80, High Rd., Streatham, London. [0751]

1914½ Rudge Multi, 3½ h.p., Milliford sidecar, perfect condition; £50, or nearest.—12, Holmby Park Av., Brighton. [8040]

1914 5-6 h.p. Rudge Multi and Swan sidecar, Miller lamp; £42, or near offer; fine condition.—The Garage, Whitland, S. Wales. [X8148]

SEVERAL good and very cheap Ridges for sale; send for list.—Morgan and Maxwell, the London Motor Mart, 80, High Rd., Streatham. [0752]

1912 3½ h.p. Rudge, N.S.U. 2-speed, everything in perfect condition; bargain, £26/10.—C.C.R. Motor Works, St. Ann's Well Rd., Nottingham. [X8212]

1914 Rudge Multi, with sidecar, as new, £43, lowest; also Voltite dynamo, with lamp and bracket, accept £2, or nearest.—Olivet, Belmont Rd., Luton, Beds. [8075]

1915 5-6 h.p. Rudge Multi, sidecar, hood, screen, speedometer, 4¼ lamps, spares, bought White, sunside, excellent condition; £65, no offers.—Aban, 22, New King St., Bath. [8107]

1911 Rudge and coachbuilt sidecar, just fitted new N.S.U. 2-speed, new piston and rings, new heavy Dunlop and tube, belt, Klaxon horn, all spares; £32 gns.—Groves, 7, Emore Rd., Putney. [8028]

## Scott.

1914 Scott, T.T. bars, Binks carburetter, good order; £41.—Reply, Strong and Co., S. Farnborough. [8043]

SCOTT, 1910, 2-speed, cane sidecar, lately overhauled, good condition; £25.—Walden, 46, Sandy Hill Rd., Plumstead, S.E. [8135]

SCOTT, 1912, cane sidecar, 1915 lubrication, new spare tyre, lamp, all in good condition; £32.—Forster, Mersey St., Warrington. [8174]

LATE 1913 3½ h.p. Scott, thoroughly overhauled, and in good condition, new tyres, lamps, and horn; price—£35.—Walker, Fishburn, Ferry Hill, Durham. [X8096]

SCOTT, 1914, at works all summer, overhaul costing £18, Claudel carburetter, semi T.T. touring bars, perfect running; £48.—MacLennan, 9, Blantyre Terrace, Edinburgh. [8033]

SCOTT, 1914 model, fitted with Mills-Fulford coach-built Corvette sidecar, smart and reliable combination; bargain at £55; inspection invited.—Wauchope's, 9, Shoe Lane, London. [X8245]

SCOTT, late 1913, 1915 drip lubrication, Binks carburetter, run about 5,000 miles, with smart coach sidecar, fitted with wind screen, luggage carrier, all accessories, in exceptional condition; seen any time; £48.—Saunders, Brockwell, Chesterfield. [X8264]

## Sheffield Minor.

SHEFFIELD Minors.—Immediate delivery of this exceptionally fine 2½ h.p., 2-stroke single-speed, 28 cos., 2-speed, 33 gns., including 1916 improvements.—Colmore Depot, 31, Colmore Row, Birmingham. [X2340]

## Singer.

SINGER, 2½ h.p., sidecar, mag., good order; £12; exchange considered.—Perry, 20, Reaford Rd., Kennington. [8173]

SINGER, 1914, T.T., 3½ h.p., just overhauled, accessories, good tyres; £25.—Brewster, Lord Warden Hotel, Dover. [8044]

2½ h.p. Special Singer, T.T., lamp, spare belt, tools, 4 very fast; 30 gns. exchange combination.—Richards, 8, Parkhill Rd., Birkenhead. [X8070]

1912 Singer, 3½ h.p., 2 speeds, brand new Palmer cord and Dunlop belt, lamps, horn, and tools complete, in first-class condition; £23.—Gordon Warr, Hindhead, Surrey. [8214]

## Sun.

1915 Sun-Villiers, 2 speeds, 2-stroke, excellent condition; £28.—Write first, 1, Campbell Rd., Crystal Palace, S.E. [0758]

## MOTOR CYCLES FOR SALE.

## Sunbeam.

SUNBEAM, 1916, immediate delivery; can I help you to one? exchange or deferred payment.—Bunting, Harrow. [8090]

1915 6h.p. Sunbeam Combination, speedometer, lamps, horn, in new condition; £95; seen any time.—223, High Rd., Kilburn. [8212]

1914 6h.p. Sunbeam, Montgomery sidecar, hood, wind screen, lamps, etc., perfect condition; £80.—Taylor Bros., Intake Lane, Ossett. [X8079]

1915 3½h.p. Sunbeam Combination, electric horn, lamps, wind screen, a beauty; £70; owner buying car.—Fellgett, Mostyn Av., Llandudno. [X8191]

LATE 1914 3½h.p. 3-speed Sunbeam, best Lucas lamp, horn, and rear lamp, not done 1,500, guaranteed perfect as new; £50.—Box 9,857, c/o The Motor Cycle. [X8266]

ONLY Wants Seeing.—Sunbeam, T.T., 3½h.p., late 1914, little used, perfect condition, many accessories, original tyres still good; £51, or near offer.—Dulton, Optician, Northwich. [8049]

SUNBEAM, 3½h.p., 1916, the ideal single-cylinder sidecar machine, delivery from stock. Recognised agents. Exchanges.—Tel.: 388. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [8686]

3½h.p. New Sunbeam, latest model, countershaft 3-2 speed gear, and chain drive, still in crate, just as delivered from makers, price 70 gns.; also a magnificent second-hand 1915 Sunbeam, 3-speed countershaft model, and chain drive, fitted with speedometer, lamp, horn, and tools, etc.; £267/10 cash; extended payments or exchange.—Wauchope's, 9, Shoe Lane, London. [X8246]

## Swift.

3½h.p. Swift, good, sound machine, running splendid; £220; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X8247]

## Torpedo.

TORPEDO, 3½h.p., multi gear, too powerful; exchange for lightweight or sell cheap, offers.—101, Cloamell Rd., Tottenham. [8136]

## Triumph.

TRIUMPH, 1912, clutch model, beautiful condition; £18/10.—Speckler, 45, Church Rd., Acton. [8241]

TRIUMPH, 3½h.p., £25, good running order; seen by appointment.—64, London Rd., Bromley, Kent. [X8204]

TRIUMPH, 1910, new tyres, and re-bushed recently; any time; nearest £20.—25, Bushy Park Gardens, Teddington. [8073]

TRIUMPH, 1911-12, T.T., new piston and bearings, just re-namelled, very fast.—E.W., 167, Willesden Lane, N.W. [8023]

TRIUMPH, 1914, actual T.T. racer, countershaft 2 speeds, very fast; £38.—P. J. Evans, John Bright St., Birmingham. [8125]

3½h.p. Clutch Model Triumph, in perfect condition; £222; exchange twin.—Thomas, 193, Vauxhall Bridge Rd., S.W. [8016]

T.T. Roadster Triumph, new September, 1914, 4h.p., fixed engine; £38; accessories.—Collings, Portland Place, Stalybridge. [X8291]

TRIUMPH, 3½h.p., 1911, P.H. lamp set, pan saddle splendid condition; £16, bargain.—160, Boundary Rd., Walthamstow. [8197]

TRIUMPH, 1914½, with sporting sidecar, etc., splendid order, all new tyres; £56.—Edwards, 19, St. John's St., Bedford. [8059]

TRIUMPH, T.T., new Mar. 1914, decompressor, easy starting, plating as new; £30.—Gordon Villa, Prescott Rd., St. Helens. [8150]

1913 Triumph, 3½h.p., 3-speed, clutch, sidecar, splendid condition; £39.—Richards, Pantmaenon, Penmachao, Bettws Coed. [X8148]

TRIUMPH, 1913, 3½h.p., clutch model, perfect order, nearly new condition; £35.—Johnson, Eastbury, Cowleigh Rd., Malvern. [X8167]

1916 Junior Triumph, 2-speed, 2-stroke, in stock; £44/2. T.A.: Bicycles. Tel.: 388.—Robinson's Garage, Green St., Cambridge. [0612]

TRIUMPH, 1914, another gem, trophy bars, 3 speeds, lovely tyres; with accessories £45, without £42.—Bunting, Harrow. [8088]

1913 Clutch Triumph, sidecar, splendid condition; £32; exchange powerful combination.—59, Church St., Stoke Newington. [8127]

SEVERAL cheap and good Triumphs for sale; send for list.—Morgan and Maxwell, the London Motor Mart, 80, High Rd., Streatham. [0753]

TRIUMPH, 3½h.p., 1913, 3-speed gear, clutch, speedometer, lamps, horn, coachbuilt sidecar; £45.—123, Sunderland St., Houghton-le-Spring. [X8169]

1912 Triumph and torpedo sidecar, 2-speed, clutch, lamps, accessories, splendid condition; £35/10.—436, Whitehorse Rd., Thornton Heath. [8162]

1912 3½h.p. Triumph, free engine model, with lamp and horn, new Dunlop tyre and belt, fine machine; £24.—The Garage, Whitland, S. Wales. [X6150]

£26.—Triumph, late 1912, clutch model, perfect condition, just overhauled, lamp, horn, new heavy Dunlop tyres, brand new Pedley back tube and Dunlop belt, full kit of tools; examination and trial.—Vesey, Fondeich, Wem, Salop. [X8141]

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ALLON, single-speed	£34 0
DIITTO, 2-speed	£42 0
CONNAUGHT Miniature, 2½ h.p.	£28 17
DIITTO, 2-speed	£36 6
COVENTRY EAGLE, 2½ h.p., 2-stroke	£32 6
DIITTO, 2-speed	£39 5
METRO, standard, 2½ h.p., 2-stroke	£28 10
METRO, lady's, 2-speed, 2½ h.p., 2-stroke	£36 10
SUN, 2½ h.p., 2-stroke	£29 10
DIITTO, 2-speed	£36 0
NEW IMPERIAL J.A.P., 2-speed	£36 15
DIITTO, with clutch and kick starter	£43 0
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IVY, Tourist, 2-speed	£36 0

## FOR SOLO OR SIDECAR WORK.

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B.S.A., Model 11, 4½ h.p., 3-speed, chain drive	£64 0

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MILLFORD	£12 12
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5-6 h.p. HAZLEWOOD, 3-sp. countershaft, combination, with windscreens and luggage grid	£88 0
6 h.p. ENFIELD combination	£89 5
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Or with CANOLET Sidecar	£87 18
4 h.p. 3-speed A.J.S. combination	£93 17
7-9 h.p. EXCELSIOR, 1915, 3-speed, clutch, and kick starter	£72 10
Or with EMPIRE Sidecar de Luxe	£85 0
3½ h.p. BLACKBURN, 1915, 3-sp. Sturmev-Archer countershaft	£63 0
Etc.	

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1915 TRIUMPH Junior and accessories, like new	£34 0
1914 DOUGLAS, T.T., 2-speed	£38 0
PREMIER, 1912-13, 3½ h.p., 3-speed	£30 0
REX combination, 1914, 7 h.p., 3-speed, with speedometer and accessories	50 gns.
NEW IMPERIAL J.A.P., 2½ h.p., 2-speed	£25 0
3½ h.p. TRIUMPH and Sidecar, 2-speed, free engine, and accessories	£27 0
ZENITH-J.A.P., 6 h.p., Gradua gear	30 gns.

Full List Post Free.

EXTENDED PAYMENTS, one-fifth deposit and twelve monthly payments.

**THE SERVICE Co., Ltd.,**  
289-293, High Holborn,  
LONDON, W.C.  
'Phone—250 Central. Wires—"Admittedly."

## MOTOR CYCLES FOR SALE.

## Triumph.

1912½ Clutch Triumph, excellent condition, new tyre and tube back; £30, or part exchange lightweight.—Booker, New Farmhouse, Epping. [8216]

1914 Triumph, 4h.p., 3-speed, and Burbery sidecar, perfect condition; £55, or exchange late T.T. Douglas and cash.—11, Banbury St., Watford. [8199]

TRIUMPH, late 1914, 4h.p., 3-speed gear, clutch, Canolet sidecar, in perfect condition; £50, lowest.—H.C., 110, Southcroft Rd., Tooting, S.W. [8134]

1908 3½h.p. Triumph, grand running order, climb anything, new Dunlop belt, good tyres; great bargain, £12/10.—349, Gloucester Rd., Bristol. [X8310]

1913 3½h.p. 3-speed Triumph, with Canolet coachbuilt sidecar; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0734]

TRIUMPH, 1913, 3½h.p., clutch model, in good condition, tyres as new, lamp, Klaxon; price £25.—Apply, Byrde, Rectory, Ludgershall, Wilts. [8020]

SPECIAL 1914 T.T. Triumph, selected engine, mileage 800, fast, Lucas accessories, guaranteed perfect and unscratched; £42.—Empson, Camlingay, Sandy. [8093]

1911 Triumph, 3½h.p., free engine model, in splendid condition; for quick sale will accept £22/10.—Apply, Lieut. Halladay, R.E., c/o Robins and Day, Ltd., Rochester. [X8206]

TRIUMPH and Coachbuilt Sidecar, Gradua gear, lamps, tools, spares, etc., in splendid condition; £36.—28, Ellerby St., Fulham Palace Rd., Fulham. Tel.: 531 Putney. [8168]

1913 3-speed Triumph, with brand new 17 gn. Gloria sidecar, luggage rail, all accessories, perfect; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0720]

TRIUMPH, 1914½, standard model, 3-speed, guaranteed under 2,000 miles, in absolutely new condition, with race sidecar; £48/10.—Victor Wright, 192, Albion Rd., Stoke Newington. [8064]

TRIUMPH, 1914, 4h.p., 3-speed, Bramble sidecar, speedometer, 2 horns, 2 lamps; owner buying cycle car; 53 gns., or near offer.—Triumph, Church House, Gworie Rd., Clapham, S.W. [X8187]

TRIUMPH, 1912-1913, 3½h.p., 3-speed gear, 1915, done 2,000 miles, magnificent order, only used week-ends, every accessory, spares; £28.—Lt. L. H. Lewis, East Lancashire Regt., Wareham. [8221]

1913 Triumph, 3-speed, free engine, clutch, latest Middleton coachbuilt sidecar (as new), fully equipped, smart combination, speedometer, and complete accessories, splendid condition throughout; £48, bargain.—35, Whittingstall Rd., Fulham. [8171]

3½h.p. Triumph, late 1913, 3-speed Sturmev J.S. 32 hub, clutch, with C.B. sidecar, splendid condition, accessories, horn, lamps, speedometer, decompressor, tyres perfect; £42.—Box L385, c/o The Motor Cycle, or Phone 1625 Streatham for appointment. [8237]

## Trump.

TRUMP-J.A.P., 500c.c., single-cyl., T.T. model, mag., special frame, wide tank, quick fillers, good tyres, running order; sacrifice £18/10, no offers; owner enlisted; photo 6d., returnable.—William Groves, Sheffield House, Shrewsbury. [X8097]

## Tyler.

TYLER, 1915, 2-stroke, 2-speed, good as new; can be seen after 7.30 by appointment; price £26.—Wm. Chapman, 123, Gradison Rd., West Side, Clapham Common, S.W. [8210]

## V.S.

V.S.-J.A.P., 8h.p., 2-speed, Montgomery sidecar, new condition, complete, genuine bargain; private owner, having joined H.M. Forces.—Apply, Conway Agency, Woking. [8142]

## Velocette.

VELOCETTE, 2½h.p., 2-stroke, new November, done 200 miles, all accessories, overalls; £31.—Woodier, Rochester, Staffs. [X8268]

LATE 1914 2½h.p. 2-stroke Velocette, 2-speed, chain drive, patent automatic lubrication, thoroughly overhauled; £25.—C.C.R. Motor Works, St. Ann's Well Rd., Nottingham. [X8213]

## Wolf.

A.J.S.-WOLF Lightweight, fine running order, good tyres, new belt, pulley; £7/10.—Latters, Galant, 11, Brunswick Av., New Southgate, N. [8074]

WOLF, 2½h.p., 1916 model, just delivered, 2-speed, 2-stroke, kick starter, hand-controlled clutch; £36/19/6, exchanges or deferred payments.—Eagles and Co., High St., Acton, W. [X8223]

2½h.p. Wolf Models, 1915.—Delivery from stock of 2½h.p. J.A.P. engine, 2-speed gear, £37/4; 2-stroke 2-speed models, £32/11/9; single-speed models, £25/6/3, cash or extended payments.—Wauchope's, 9, Shoe Lane, London. [X8248]

## Yale.

9h.p. Yale Combination, luxuriously equipped, new, perfect; any trial; £85.—Hudson, Chemist, 601, Greco Lanes, N. [8099]

## Zenith.

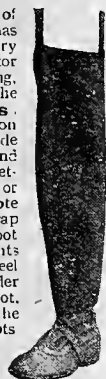
ZENITH-GRADUA, 1912, 3½h.p., fine order, usual accessories; £23.—77, High St., St. John's Wood. [8146]

ZENITHS.—1916 models at P. J. Evans, Birmingham Depot, immediate delivery all models, 87-91, John Bright St. [8119]



**CLOTHING.****THE "GROSE" MOTOR CYCLING BOOT WADERS.**

This style of protection has become very popular for motor cycling, fishing, and lately in the trenches. With these on you can wade across brooks and ford without getting the feet or legs wet. Note our special strap fixing at foot which prevents sagging at heel and holds wader tight on foot. Worn over the ordinary boots



Per pair 15/6

With Leather Soles ... 22/6  
Hutchinson's make, with  
Leather Soles ..... 25/-

**The "MOTO" SUIT.**

Good quality fawn waterproof, double texture twill. All seams sewn, taped, and solutioned. High storm collar. Dust, wind, and rainproof. Ventilated under arms. Two side pockets. Full length leggings, well-shaped spat, and strap under instep.

The Suit ..... 16/6  
Legg. only ..... 5/6  
Jacket only ..... 12/6

**The "BROOKLANDS" SUIT.**

Similar to the "Moto" Suit, but superior quality. The Suit, 21/-, with leggings. The Suit, 24/-, with seatless trousers, giving waist protection.

Fawn Waterproof Leggings, 4/6 and 6/9  
Fawn Waterproof Seatless Trousers ..... 10/-

**MOTOR CYCLING RACING CAPS.**

Brown leather, with ear rolls ..... 3/9  
Ditto, fleece lined ..... 4/3  
Fawn waterproof ..... 1/11  
Linked Leather Waist Belts ..... 1/3

**BLACK "OILSKINS."**

Jackets ..... 7/6  
Leggings ..... 3/6 and 4/6

**BELTING.**

Pedley 1/2 1/4 1/7 1/10 2/3  
per ft. 1/2 1/4 1/7 1/10 2/3  
John Bull 1/5 1/8 1/11 2/5  
per foot 1/5 1/8 1/11 2/5  
Dunlop 1/5 1/8 1/11 2/4  
per foot 1/5 1/8 1/11 2/4  
Grose—Rubber and Canvas. Samples free.

per ft. 10d, 11d, 1/11 1/4 1/8  
John Bull and Pedley Belts in lengths about 4ft. less 40%.

Use two fasteners.

**SPARE PETROL TANKS.**

Torpedo shape, to clip on top tube. Aluminium enamelled. Quart size ..... 5/6  
Half-gallon size ..... 7/6  
One-gallon size ..... 9/9

**JACKS.**

Special for cycle cars .. 3/6

**TANK CLIPS.**

Complete with base-plate and bolts ..... 3d.

**TYRES.****HUTCHINSON.**

Clearance, 2nd Choice. Usual

**BROOKLANDS.** Price.

26 x 1 1/2 Non-skid 14/6 21/-

26 x 2 1/2 " 15/- 22/3

26 x 2 1/2 " 14/6 23/-

**T.T.**

24 x 2 Non-skid 19/- 26/-

26 x 2 1/2 " 20/- 29/-

26 x 2 1/2 " 18/6 31/-

**PASSENGER.**

26 x 2 1/2 Non-skid 24/6 36/-

26 x 2 1/2 " 25/- 38/-

**LIGHT CAR, 3 Rib.**

650 x 65 ..... 25/- 48/-

**AVON****BATES****CLINCHER****DUNLOP****HUTCHINSON****KEMPSHALL****MICHELIN****PALMER****PEDLEY****R.O.M.****JOHN BULL****CONTINENTAL.**

All guaranteed perfect and new tyres.

26 x 2 1/2 standard 14/6 22/6

26 x 3 standard 16/6 31/3

26 x 2 1/2 T.T. n.s. 18/6 26/10

26 x 2 1/2 T.T. .... 21/- 28/9

26 x 2 Non-skid 12/6 19/3

26 x 2 1/2 Combination Steel Stud &amp; Rubber Bar 36/- 50/-

26 x 2 1/2 ditto ... 35/- 54/6

650 x 65 ditto 34/6 54/6

26 x 2 1/2 Sidecar 10/6 15/-

650 x 65 Autobi 25/- 40/-

15% allowance off Continental covers for your old cover.

**CLINCHER.**

26 x 2 Junior, ribbed ... 10/-

26 x 2 1/2 " .. 11/6

26 x 2 1/2 " studded 11/6

26 x 2 1/2 " .. 13/6

650 x 65 Dreadnought 29/-

700 x 80 .. 35/-

to fit 650 x 65 rims

**DUNLOP, Etc.**

Grose's remades—

26 x 2 1/2, 26 x 2 1/2 .. 9/-

**INNER TUBES.**

The "Spur" Red Rubber (guaranteed for 12 months)

**Inner Tubes.**

26 x 2 plain 4/3 Butted 5/3

26 x 2 1/2 " 4/9 " 5/9

26 x 2 1/2 " 5/3 " 6/3

**Hutchinson 2-join Inner Tubes**

26 x 2 ..... 3/-

26 x 2 1/2 ..... 3/6

26 x 2 1/2 ..... 3/9

**TYRE SUNDRIES.**

Clip-on Rubber and Canvas Gaiters ..... 1/1

Clip-on Leather Gaiters ..... 1/4

One-minute Pattern Tyre Levers, set of three ..... 6d.

3/- size Patchquick Outfits ..... 2/6

Security Bolts ..... 2d.

Tyre Repair Clips for repairing broken beads, enough for two 6in. repairs ..... 1/-

**TOOLS.**

Best leather, lined Flaxite and armoured, size 7 1/4 x 4 1/2, fitted with lock, to fit on side of carrier ..... 4/9

Patchquick Leather Repair Outfit Case ..... 1/4

**VALVES.**

Inlet or Exhaust, to suit most engines ... 3/3

Valve Tappet Adjusters, set of six ..... 4 1/2d.

**SPRINGS.**

Inlet and Exhaust ..... 3d.

**SILENCERS.**

The Grose Silent Silencer 2/6

EST. 1876.

**OLD JEWRY, CHEAPSIDE, LONDON, E.C.**and at 255-257, Holloway Rd., London, N.  
and at 8, New Bridge Street, E.C.

The T.T. Douglas pattern Handle-bars. Plated **6/6**  
Other shapes in stock from 4/9

**TERRY'S SPRING LINKS**

A marvellous auxiliary to fork springing. Can be fitted to all makes of the link pattern.

**10/6 pair.**

The 'Spur' Swan Neck

Seat Pins, 5/- plated. Not plated, 4/-  
The lowest position obtainable.

**THE 'COLLEGE' MUD SHIELDS.**

Without pockets **10/6**  
Apron to cover knees ..... 5/- extra.  
This is the best device on the market for dirty weather.

**Auxiliary Sidecar Arm .. 5/11**

**The 'GROSE' ELECTRIC HORN.**

Complete with Cable and Switch **12/6**

**GLOVES.**

Cape leather, with loag gauntlet ..... 3/9  
Cape leather, superior ..... 4/3  
Cape leather, lined ..... 4/9  
Black extra strong leather, with loag gauntlet ..... 4/9  
The "TRANSPORT," as supplied to the Government, extra warm and strong. Try a pair. Cash returned if not satisfactory. **5/6**

**MIRRORS.**  
to fit on handle-bar 1/-  
5 x 4", brass, for cycle car 3/3

**MUDGUARDS.**  
3 1/2" wide, complete, pair 2/9  
Do. do, enamelled .. 3/9

**SIDECAR MUDGUARDS.**  
3 1/2", extra strong stays, enamelled ..... 5/3  
Do., with side valance. 6/9  
Do., not enamelled .... 5/3

**NUMBER-PLATES.**  
For front or back ..... 6d.  
Complete with clips.

**BELT FASTENERS.**  
Detachable hook pattern 3d.  
Forward, with 3 books.. 7d.

**SPRINGS FOR SPRING FORKS**  
For Douglas ..... 1/3  
For Druid ..... 1/3  
Various

**GOGGLES.** Per pair.  
Red rubber ..... 7/8  
La Svelte ..... 1/6  
Cup shape, collapsible side 1/3  
Pear ..... 1/3  
Four-glass pattern .. 1/3

**SPARKING PLUGS.**  
Bosch ..... 3/6  
E.I.C. (usual price 5/-) .. 1/6  
The "Grose," guaranteed 1/6

**ENAMELS.**  
Robbialac, black or colours 1/5  
Petrol-proof ..... 10d.  
Radiolene, for cylinders 9d.

**SPEEDOMETERS.**  
Stewart's. Registers to 75 m. p. h., season's mileage to 10,000 m., and 100 m. set-back trip recorder ..... 50/-  
Corbin-Brown do. do. 45/-

**SPRING - FORK ATTACHMENTS.**  
For converting fixed to spring forks ... pair 14/-

**SADDLES.**  
Large size, very comfortable ..... 6/9  
Lycett's Liro ..... 11/6  
" Pan Seats ..... 16/-

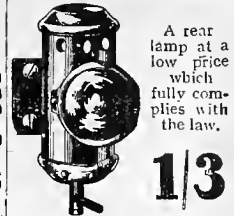
**STANDS.**  
Lycett's spring back pat. 7/6

**TOOL ROLLS.**  
Canvas ..... 6d.  
Do., best ..... 1/-  
Do., leather ..... 1/4  
Do., superior .. 1/11 and 2/6

**CANVAS STRAPS.**  
Stronger than leather.

24 x 1/2 in. .... 3d.  
30 x 1/2 in. .... 4d.  
36 x 1/2 in. .... 5d.  
42 x 1/2 in. .... 6d.  
48 x 1/2 in. .... 7d.  
54 x 1/2 in. .... 8d.  
54 x 1/2 in. .... 10d.

**BRAKES.**  
Belt rim, foot operated 6/9  
Do., with rubber end footrests ..... 13/3  
Brake Blocks, to suit all makes ..... 1/-



The "SPUR" REAR LAMP

The "WINCO" Rear Lamp.

Shows red light at rear and white on number-plate.

Solid Aluminium ... **3/9**

**LAMP SUNDRIES.**  
Brass Y Pieces ..... 4 1/2d.  
Rubber Tubing, per yd. 6d.  
Surridge's Gas Bags and Tubes,  
9" 11d., 12" 1/4, 15" 1/4  
Bray's Roni Burners ..... 7d.  
Bray's Special Rear Lamp Burners ..... 3d.

**LAMP GENERATORS.**  
Special for rear lamps ... 4/3  
Barnes 8/6. Worth 12/6

**ALUMINIUM MATTING.**  
gin. wide ..... per ft. 1/-  
12in. wide ..... " 1/2

**CONTACT FILES.**  
Knife pattern ..... 4d.  
Magnet knife file and gauge ..... 1/-

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Prices' qts. 1/8 galls 5/-  
Vacuum ..... 1/8 " 5/-  
Grose's ..... 1/2 " 5/-  
B.S.A. .... 2/- 1/2 galls. 3/6  
" c'shaft " 1/8 " 2/8

**GREASES.**  
Prices' Hub Lubri- cant ..... 1 lb. 9d.  
" Rangraphine 1 lb. 9d.  
Graphite Grease ... 1 lb. 9d.

**PISTON RINGS.**  
To suit most makes ... 1/3

**SIDECAR SUNDRIES.**  
Brass Turnstuds and Washers ..... each 3d.  
Body Plates and Bolts 3d.  
U Bolts ..... 4d.  
Torpedo Mats ..... 2/8  
Wind Screens 21/- and 24/6  
SHACKLES. 2in. ... 1/-  
gin. ... 1/2 gin. ... 1/7  
gin. ... 1/4 gin. ... 1/10

**TRANSFER NUMBERS.**  
To transfer on, per doz. 9d.

**HORN BULBS.**  
Size 2 4 6 8 10  
6d. 8d. 10d. 1/1 1/5

**CARBURETTER PARTS.**  
Jets for B. & B. .... 8d.  
" Amac ..... 4d.  
" Senspray ..... 4d.  
Various parts in stock.

**CARRIERS.**  
Tubular, very strong ... 3/9  
Do., with double support stays ..... 5/6

**CARBIDE CARRIERS.**  
Leather, to hold 1 lb. tin of carbide and strap on cycle ..... 1/4  
Do., in Flaxite ..... 10d.

**RENOLODS CHAINS AND PARTS.**  
We have a fairly good stock of 1/2 in. chains .. 3/- per ft

To buy at these Prices, this Advert. must be mentioned. Terms: Cash with order only. All prices are for goods now in stock, and subject to being unsold. Cash returned for any goods if not satisfied. ON THESE PRICES CARRIAGE AND POSTAGE EXTRA. MOTOR CYCLE LIST POST FREE. 'PHONE, WRITE, OR CALL.

In answering this advertisement it is desirable to mention "The Motor Cycle."



The sign of  
the crossed  
feathers

# Levis

—the master  
Two-stroke

## Watch The "Levis"

THE "LEVIS" set the fashion in Two-strokes. It was the first successful air-cooled Two-stroke motor cycle put on the market. It has had hosts of imitators, but it still maintains its lead in every respect.

### Why ?

The first "Levis" built was the outcome of our own knowledge, experience, and experiment. We imitated none — we originated. We produced a new type of motor cycle and speedily proved its worth. The history of the "LEVIS" is a story of remarkable and continuous success.

And it is not our policy to stand still. We are leaders — not followers. We have introduced many innovations, and we have more to come. These will be announced when circumstances permit, and meanwhile our advice to all riders or intending riders of Two-strokes is "Watch the 'LEVIS.'"

Particulars of our improved 1916 models will be sent on request.

**Butterfields, Ltd., Stechford, Birmingham.**

London Agents: Car & Motor Sundries, 175, Shaftesbury Avenue.



## HELP IN COMPETITIONS

Mr. F. L. DOOLY, of Cork, writes:

June 28th, 1915.

"My wins in last season and this already, with the same WATFORD, are:

**THREE SILVER CUPS,  
FIVE GOLD MEDALS,  
THREE SILVER MEDALS, and  
ONE BRONZE MEDAL."**

Write for Catalogue to—NICOLE, NIELSEN & CO., LTD.  
(Governing Director: R. B. NORTH.)

Inventors and Patentees of the Chronograph, 1862; Split Seconds, 1871; and Speedometer, 1904.

**THE WATFORD SPEEDOMETER WORKS,**  
London Showrooms - - - 14, SOHO SQUARE, W.  
Telephone—2833 Central. Telegrams—"Niconielco, London."

### THE FIRST MOTOR CYCLE SPEEDOMETER

to enter and pass an officially observed  
**AUTO CYCLE UNION 3,000 MILES TEST.**

**BUY IT BECAUSE  
IT'S A BETTER  
INSTRUMENT.**



#### PRICES—

**Type 706 .. £3 3 0**  
Indicates speeds to 60 miles per hour, with total mileage counter to 10,000 miles and repeats.

**Type 702 .. £4 4 0**  
Indicates speeds to 60 miles per hour, with total mileage counter to 10,000 miles and repeats. Quickly re-set trip counter to 100 miles and repeats.

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Indicates speeds to 60 miles per hour, with total mileage counter to 10,000 miles and repeats. Quickly re-set trip counter to 100 miles and repeats. Maximum speed hand. With type 399 watch £1 1 0 extra.



# NEW HUDSON

## SERVICEABILITY & SATISFACTION

are combined in the highest degree in the NEW HUDSON by reason of the accuracy, thoroughness, and expert supervision which govern the manufacture of its parts, the construction of the complete machine, and finally its tests. Efficiency and Reliability unquestioned, its appearance compels admiration—the satisfaction and pleasure of ownership is without comparison.

### THE NEW HUDSON LIGHTWEIGHT

2-Stroke. 2-Speed.

A practical combination of Utility, Convenience, and Dependability—Substantial and Convincing in appearance. It is simplicity itself, and its control delightfully easy, attractive in appearance and comfortable in use.

MODEL D. .. .. £42.  
Model C. .. .. £38.

The Countershaft Gear Box is a feature of all NEW HUDSON Models.

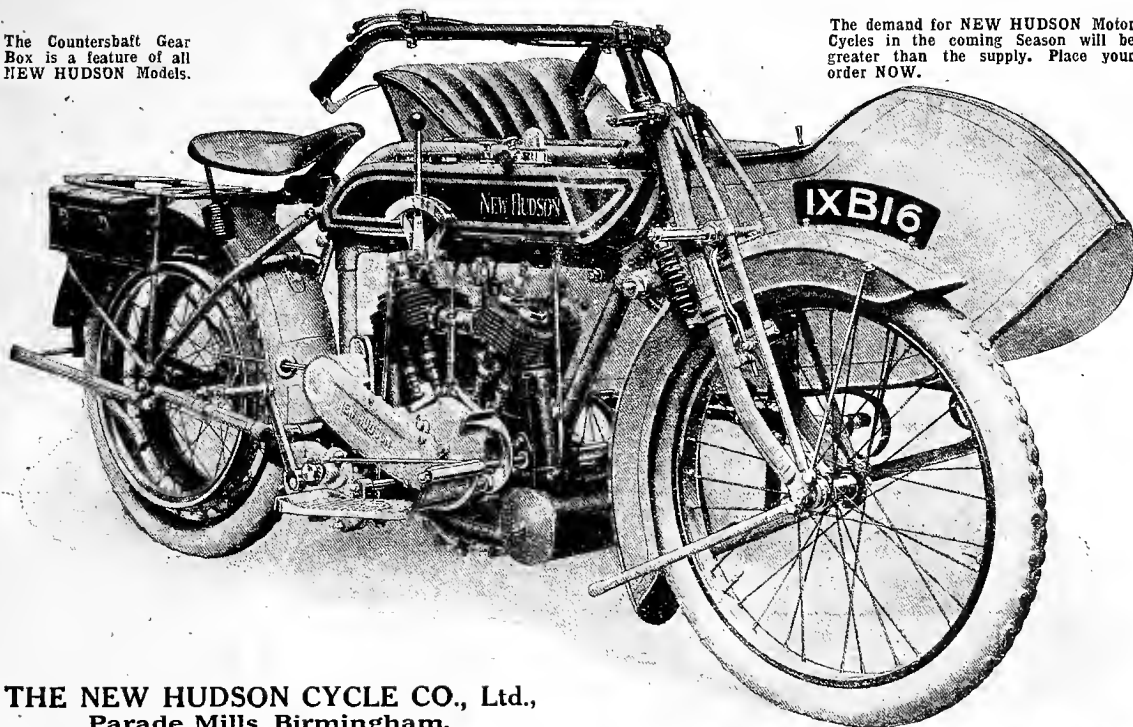
### THE NEW HUDSON "BIG SIX"

Passenger Outfit. 3-Speeds.

Represents the highest degree of luxurious equipment, affording unexcelled comfort and satisfaction to those to whom economical motoring for two, coupled with sure dependability, is the one consideration.

MODEL IXB .. .. £92 8.  
Solo Model IXA .. .. £75 12.

The demand for NEW HUDSON Motor Cycles in the coming Season will be greater than the supply. Place your order NOW.



THE NEW HUDSON CYCLE CO., Ltd.,  
Parade Mills, Birmingham.  
LONDON .. 43-45, Gray's Inn Road.

# A.B.C.

ALL BRITISH CONSTRUCTION

## PERFECTION PROVED

BY  
PERFORMANCE.

The perfect design and construction of the A.B.C. Motor Cycle have been proved by performance—in speed events on the track, in official road trials, and in the service of owners.

Ask us to send you our 1916 catalogue, which will be ready in a few weeks.

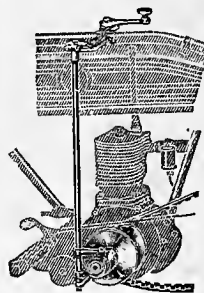
**A.B.C. MOTORS,  
LTD..**

**Walton-on-Thames.**

'Phone: Walton-on-Thames, 250  
Grams: Revs, Walton-on-Thames

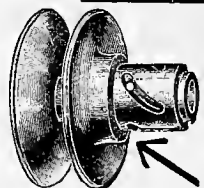
## The "GRADO" MULTI-PULLEY

with Free Engine.



Starts your machine like a car!  
Takes your machine and sidecar up hills impossible without!  
Gets you safely through thickest traffic!  
Ensures safety over greasiest roads!  
In fact, it turns work and danger into a pleasure!  
Just half a turn of the handle on top tube changes from top gear to free engine!

Fitted in two hours to Triumph, Bradbury, B.S.A., Rudge, Precision, T.D.C., Rex, Singer, Premier, etc.



Beware of Imitations and Infringements

Price - - - £3 : 3 : 0

for Engines up to 6 h.p. 10/- extra to suit Engines with crank bosses, like J.A.P., old Rex, etc.

Lightweight Model £2 10 0

Here is the curved slot which ensures the belt never slipping on the lowest gear.  
Delivery from Stock. Write us to-day for further details. See "Motor Cycling," 23rd Feb.

The Grado Manufacturing Co., Pershore St., Birmingham.

# Insurance



**R**EADERS of "The Motor Cycle" wishing to insure a motor cycle, sidecar, or light car, can obtain quotations for suitable policies by filling in the attached form and forwarding it to:

The Manager, Insurance Dept.,  
"THE MOTOR CYCLE" Offices, Coventry.

## ENQUIRY FORM

(To be sent to above address).

Make of Machine.	H.P.	Date of Manufacture.	Present Value.	Registered Number.

## SPECIAL .. NOTE ..

A copy of

## THE MOTOR CYCLE

is supplied by post each week for twelve months with all policies upon which the premium is not less than

£2 : 7s. : 6d.

Will machine be driven solely by owner?.....

" " " " " for pleasure?.....

Will passenger be carried on luggage carrier or pillion of motor cycle?.....

Name .....

Address.....

.....



## Quite a Boom

in motor cycles for business purposes — and in Melbourne, as elsewhere, the reliable Royal Enfield is invariably the chosen machine.

There never has been a motor cycle to equal the Royal Enfield for consistent reliability. Over Scottish roads where no sidecar combination had penetrated before, climbing the precipitous slopes of Table Mountain, carrying letters in far-off New Zealand, and with the British, Belgian, French, and Russian Armies in the sternest spheres of war, Royal Enfield motor cycles have always "made good."

*Copy of the Royal Enfield Motor Cycle Catalogue prompt'y sent on request. Mention "The Motor Cycle."*

**THE ENFIELD CYCLE CO., LTD., REDDITCH.**

**And 48, Holborn Viaduct, London, E.C. Agents Everywhere.**

*Contractors to His Majesty's Government, the French and Belgian Governments, and the Russian Imperial Military Authorities.*

# ROYAL ENFIELD

*In answering this advertisement it is desirable to mention "The Motor Cycle."*

# The **Pope Motor Cycle.**

A proposition worth **YOUR** investigation.

For Strength, Reliability, and Speed unsurpassed.

These Frames **DO NOT** Collapse  
and let you down.

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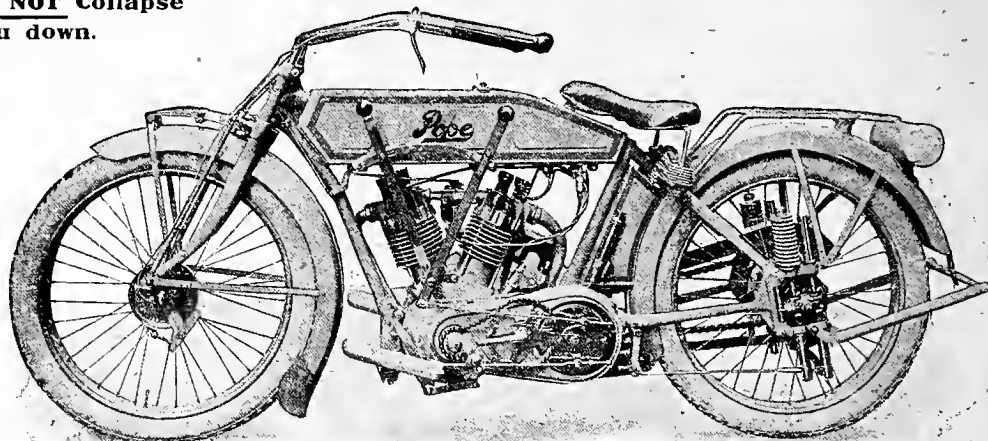
The idea was:

The finest possible  
machine.

**THAT** idea is **NOW**  
an accomplished  
**FACT.**

**NOTE** the Rear  
Springing, the  
finest in the world.

It is **IT.**



"H. 15." THE BIG TWIN.

Send for Prices and Particulars of our Productions to

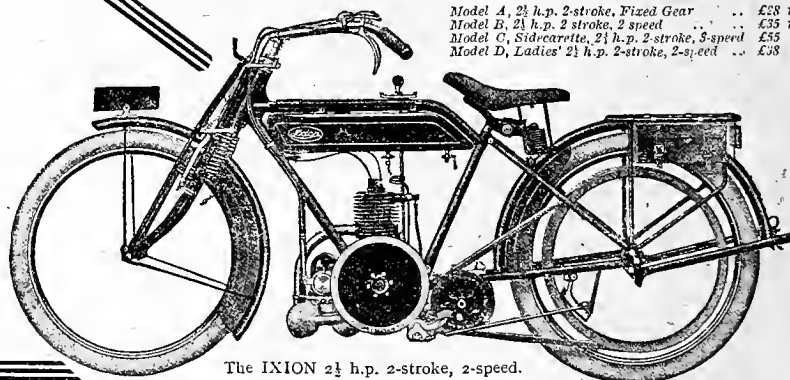
**THE POPE MOTOR CYCLE AGENCY, 55, Banner Street, Golden Lane, LONDON, E.C.**  
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is a machine of high-class manufacture, simple in design; easy in manipulation; light on tyres, petrol, and oil; excellent at climbing hills; steady in traffic; has a useful turn of speed when required, and—Fitted with Special Twin Silencer, is distinguished for sweet and quiet running. You should investigate.

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The IXION 2½ h.p. 2-stroke, 2-speed.

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have attained a reputation in the motor cycle world by an intelligent anticipation of demands, and the production of first-class goods at popular prices.

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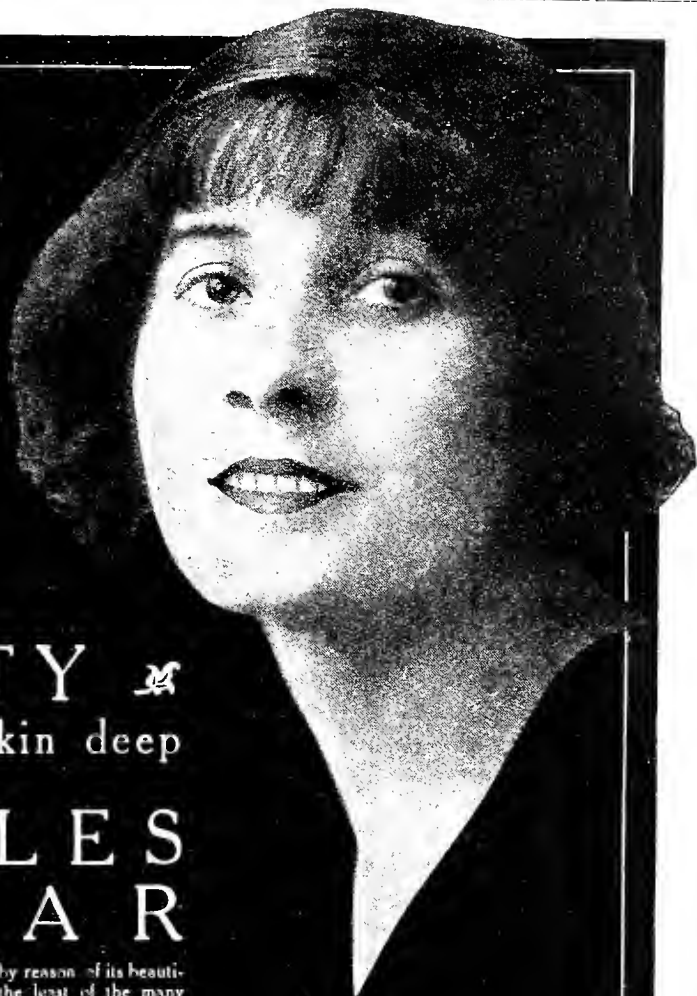
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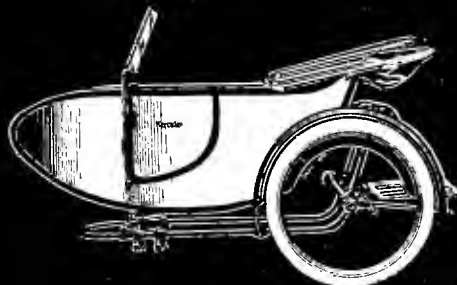
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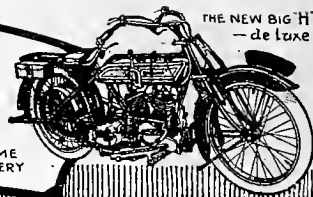
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1915 Catalogue now ready.

Lightweight ..	£23 0 0
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A REAL MOTOR CYCLE IN MINIATURE

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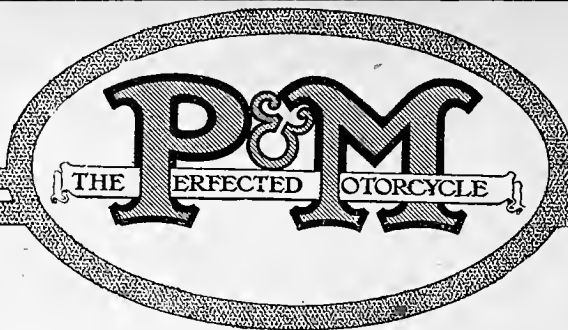
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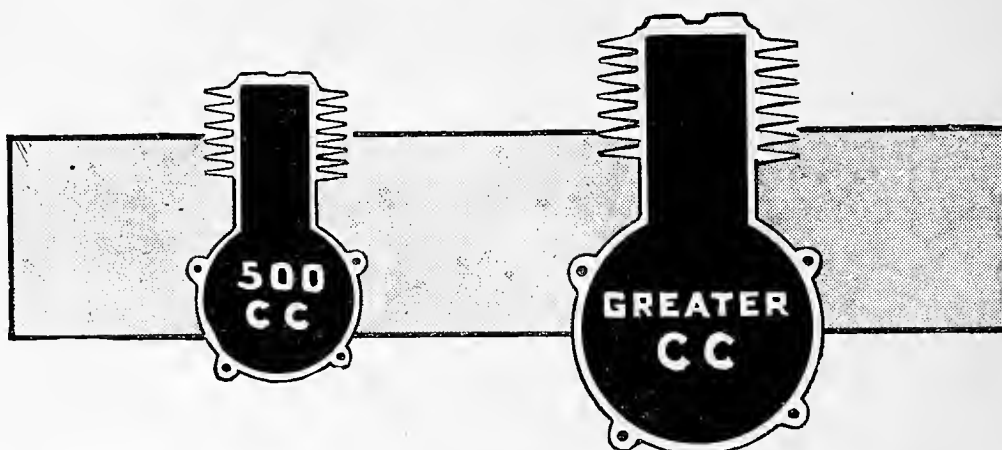
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They came to the conclusion that 500 c.c. was sufficient for a single-cylinder machine.

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## MOTOR CYCLES FOR SALE.

## Zenith.

**ZENITH**, 1912, 6h.p., completely re-bushed last month, new Lyso belt, new wicker torpedo sidecar, all accessories, perfect order; £45.—Collins, Langley House, Lydd. [X8137]

**ZENITH-GRADUA**, one 1915 4.5h.p. model in stock, splendid condition, countershaft; £60; lamps, accessories.—Morgan and Maxwell, 80, High Rd., Stratfordham. [0757]

**ZENITH** 1915 Sporting 8h.p., countershaft clutch, etc., and coachbuilt sidecar, exceptionally smart nearly new combination, fully equipped and guaranteed; 65 gns.—Davies, 52, Gauden Rd., Clapham. [8100]

**1914** 90 bore Red Zenith, complete with horn, lamp, speedometer, etc., done 2,000; owner in France since beginning of 1915; nearest cash offer to £55.—All particulars from Capt. Gardner, R.F.A., Box 1376, c/o The Motor Cycle. [8079]

**ZENITH-GRADUA** 1916 Countershaft Models in stock; 4.5h.p. twin, model D, 64 gns.; 6h.p. model F, 73 gns.; 8h.p. model H, 74 gns.; plus 10% increase; liberal exchange or easy payment terms; sidecars in stock to fit.—Eloe and Co., 15-16, Bishamsgate Ar., Camomile St., E.C. [0551]

**NEW** 1915 Zenitha from stock: 6h.p. and 4.5h.p. countershaft free engine and kick start models; cash, exchange, and easy terms arranged. When dealing with Wauchop's your orders are assured to come satisfactorily through. Wauchop's are the oldest motor cycle dealers, and have a reputation for fair dealing.—Wauchop's, 9, Shoe Lane, London (by Ludgate Circus, City). [X8249]

**1914** 6h.p. Zenith, standard model, with Montgomery sporting sidecar, colour grey, lined black, whole outfit re-enamelled and overhauled by makers, Lucas lamp, Watford speedometer, horn, spare belt and tube case, decompressors, new tyres, guaranteed in perfect condition; 48 gns.; can be seen at The South Essex Motor Co., High St., Ilford, or write 2nd. Lieut. M. B. Elliot, M.M.G.S., Bisleys Camp, Brookwood. [0745]

## Ladies' Machines.

**DOUGLAS**, lady's, perfect order, just overhauled; £35.—Ackroyd, 2, Pemberton Ar., Bedford. [8036]

**LADY'S** Connaught, 2½h.p., 3-speed, kick starter, clutch, as new; cost £50, will accept £30.—Lowe, 80, Sycamore Rd., Handsworth. [X8230]

**DOUGLAS**, Lady's, 1915, 2-speed, kick starter, equal to new, very little used, tyres, engine, and complete machine in every detail, perfect; accept £45.—Embryo Cycle and Motor Co., Charlotte St., Hull. [8249]

## Miscellaneous.

**EAGLES**—Enfield 6h.p. 1913 coachbuilt sidecar combination, perfect condition; £52/10.

**EAGLES**—Douglas, 1914, T.T. model V, 2 speeds, excellent condition, with accessories; £36/10.

**EAGLES**—New Hudson, 4h.p., 1913 model, with 3-speed gear, kick starter, with accessories; £32/10.

**EAGLES**—N.S.U., 3½h.p. Model de Luxe, 1913, spring frame, 2-speed gear, free engine, with coachbuilt sidecar; £31/10.

**EAGLES**—Calthorpe, 1915, 2½h.p., 2-stroke model, 2-speed gear, variable mag. control, only used 250 miles, as new; £28/10.

**EAGLES**—Douglas, 2½h.p., late 1914, model U, 2 speeds, new condition, with accessories; £39.

**EAGLES**—Any of the above can be had on approval, The Motor Cycle deposit system.—Eagles and Co., High St., Acton, W. Tel.: 556 Chiswick. [X8224]

**PALMER'S** Garage, Tooting.—The pre-eminent place for purchasing. Auctions fortnightly.

**PALMER'S** Garage, Tooting.—Write for illustrated dual catalogue. More interesting to motorists than a sixpenny magazine.

**PALMER'S** Garage, Tooting.—2½h.p. Douglas, 2 speeds, clutch, kick starter; £32/10.

**PALMER'S** Garage, Tooting.—6h.p. 1912-13 Clyno, 2-speed, clutch, £25; one also with sidecar, £32/10.

**PALMER'S** Garage, Tooting.—3½h.p. Ariel and sidecar, variable gear, grand lot; £20.

**PALMER'S** Garage, Tooting.—1h.p. Auto-Wheel, late model, nice order; £7/10.

**PALMER'S** Garage, Tooting.—2½h.p. Royal Ruby, 2-stroke J.A.P., reliable; £25.

**PALMER'S** Garage, Tooting.—2½h.p. Sunbeam, Revere 2-stroke, 1915 model, as new; £25.

**PALMER'S** Garage, Tooting.—7.9h.p. Quadrant 1914 combination, countershaft gear; £40.

**PALMER'S** Garage, Tooting.—2h.p. Moto-Reve light-weight, £12; 2½h.p. Premier, £18; 2½h.p. Royal Enfield, £18; 5.7h.p. Indian, £25; 2½h.p. Torpedo Provision, £15; 2½h.p. O.E.J.A.P., 1915, £26.

**PALMER'S** Garage, Tooting.—Next auction sale 19th January, at 2 o'clock. Catalogues free. Entries invited.—Sole address, Palmer's Garage and Motor Auction Rooms, 185, 187, 189, High St., Tooting. Buses, trams pass doors. Railway stations, Wimbledon (L and S.W. Rly.), only 20 minutes Victoria via Balham (L.B. and S.C.R.). [8190]

**MOTOR** Bike, mag., B.B., sell or exchange, what offer.—O. W. Farrar, Burn, Selby. [X8172]



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no—not in khaki, but riding a machine fitted with the famous

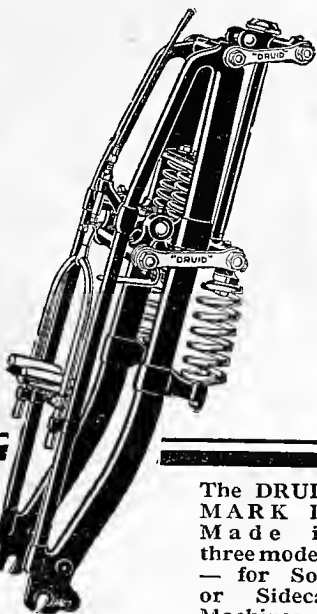
## DRUID MARK II Spring Fork-

the ONLY Fork which totally absorbs WITHIN ITSELF all Vertical AND Horizontal Shocks?

Remember, until your mount is DRUID—equipped you NEVER can experience complete immunity from Shocks, hence—

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The DRUID  
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Made in  
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— for Solo  
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## MOTOR CYCLES FOR SALE.

## Miscellaneous.

**LONGMAN** Bros., King St., Acton, W. (Phone: 1578 Chiswick), have the following exceptional bargains: **LONGMAN** Bros.—Enfield, 1914, 3h.p. twin, 2-speed, kick starter, as new, only ridden 1,000 miles, very fast; £35.

**LONGMAN** Bros.—Premier, 1912, 3½h.p., excellent tyres, belt, and condition; £17/10.

**LONGMAN** Bros.—Calthorpe-Jap, 2½h.p., Enfield 2-speed; cost £40 four months ago, only shop-soiled; £26. [8250]

**IF** You Want Bargains in second-hand motor cycles you can get them at Wauchop's 9, Shoe Lane, Fleet St., London. [5624]

**WINTER** Prices.—The following motor cycles to be cleared, each one guaranteed in perfect order, some almost brand new.—Walbro Motor Co., Saffron Walden, Essex.—Below.

**WALBRO**—1914 twin Lea-Francis, new heavy Dunlops, in very nice order; £40.—Below.

**WALBRO**—1913 3½h.p. free engine Rover, perfectly sound, new appearance, lamp set, and horn, complete; £24.—Below.

**WALBRO**—1914 4h.p. Bradbury, Sturmer-Archer 3-speed gear, new condition, take sidecar any where; £35.—Below.

**WALBRO**—1912 4h.p. Bradbury, sound all through, been re-enamelled and new tank fitted; a snap, £24.—Below.

**WALBRO**—1914 2½h.p. twin Humber, 3-speed hub, makers just charged £8 for new parts to engine, good as new; a bargain, £25.—Below.

**WALBRO**—1913 2½h.p. T.T. Douglas, 1915, W.O. bars, new 1915 tank, in very nice condition; £32.—Below.

**WALBRO**—1914 2½h.p. T.T. Douglas, in new condition, very fast, Binks carburetter; £40.—Below.

**WALBRO**—1915 2½h.p. Coventry Eagle, 2-stroke, 2-speed, almost brand new; £32.—Below.

**WALBRO**—4h.p. T.T. Norton, late model, in new condition, very fast; a snap, £25.—Below.

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**WALBRO**—1915 2½h.p. Sun-V.T.S., used one month only, as new; £26.—Below.

**WALBRO**—1915 model K B.S.A., 3 speeds, coachbuilt sidecar, lamp set, and horn, nearly new, a nice turnout, been carefully used; £58.—Below.

**WALBRO**—1915 standard Auto-Wheel, shop-soiled; to clear £12/12.

**WALBRO**—Brand new 1916 model K B.S.A., brand new 1916 5h.p. Indian, brand new 1915 model U 3-speed Douglas, in stock, ready to ride; exchanges.—Below.

**WALBRO**. Any of above can be inspected and tried; no reasonable offers refused.—The Walbro Cycle and Motor Co., Saffron Walden, Essex. [X8280]

**ZENITH**, 3½h.p., new condition, £30; Premier, 2-speed, £25; Precision, 4½h.p., nearly new, £30; 4-cyl. F.N., perfect, new tyres, £12; American Excelsior, 1916, £65; offers.—Timmons, Mansfield. [X8139]

**BARGAIN**—New motor cycle, built by owner, consisting of 5h.p. D.M.C. tricar engine, Ruthardt mag., B and B carburetter, Millennium 2-speed hub, Druid forks, all fittings in new condition, fast, powerful, £25 cash.—Carver, 179, Earlsfield Rd., Wandsworth S.W. Owner enlisted. [8039]

**WE** have a variety of second-hand machines in stock, including Levis, Clyno, New Hudson, Bat-Jap, P. and M., Calthorpes, Wolls, Triumphs, and Saxon, Chater-Lea and Crouch cars. We are prepared to make liberal deferred payments and exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8184]

**BARGAINS!**—Absolutely must clear; Sidecar 51/4, side door ditto 50/4, torpedo ditto 70/4, 1914 Auto-wheel, almost new, £8/8; 4-cyl. bicycle, 6h.p., m.o.v., clutch, chain, low, battery ignition, £10; 1912 Rex lightweight, £11/10; 3½h.p. Triumph, £14/10; 3½h.p. Humber, 1911, 2-speed, handle, £17/10; 3½h.p. Matchless, 1913, £18/10; 3-wheel 5-cwt. cycle van, £35; 1915 4-11h.p. 3-speed Harley-Davidson, kick starter, almost new, £55; 1915 4 Enfield combination, cost £104, almost new, £66. No offers. Please call.—Liquidator, 10c, Waylett Place, West Norwood, S.E. [X8323]

**FOR** a Real Bargain in second-hand motor cycles, cycle cars, gears, magneto's etc., you cannot do better than call or write Morgan and Maxwell, the London Motor Mart, 80, High Rd., Streatham, who can positively save you pounds, shillings, and pence. At the moment we have A.J.S., American Excelsior, Ariel, A.S.L., Bat, Bradbury, Calthorpe, Chater-Lea, Clyno (2 and 4-stroke), Douglas, Enfield (6h.p. combination, cheap), F.N. (several), Harley-Davidson (1915), Humber, Imperial-Jap, Indian, Ixion 2-stroke, Hazlewood, Matchless, Moto-Reve, Moto-scooter, New Hudson, N.S.U. (several), Premier (combination, cheap), Rover (several), Rudge, Singer, Sun-Villiers, Triumph, Zenith; several cheap sidecars; A.C. Sociable for sale cheap; also H.S.M. cycle car and Wall tricar; over 150 motor cycles in stock. Hours 9.30 to 10; Wednesdays 1 o'clock. [0743]

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**BASTONE'S** for Sidecars.—New coachbuilt sidecars, with Michelin tyre; £8/8.

**BASTONE'S**—New cigar pattern sidecars, with Michelin tyre; £7/7.

**BASTONE'S**—Mills-Pulford second-hand sidecar, complete, £5/5.—228, Pentonville Rd., King's Cross, London, N. [8208]

**SPORTING** Sidecar, off Indian, to clear £4.—76, Summerley St., Earlsfield, S.W. [8095]

**SIDECAR**, Coach, cost 13 gns. September; £8/10.—53, Hanley Rd., Hornsey Rise, London. [X8256]

**PHENIX** Sidecars and Phoenix Sidecar Bodies.—We are actual manufacturers. Established 1889.

**PHENIX** Sidecars.—38 models to suit all motors. Write for list.

**PHENIX** Sidecars.—1916 list now ready; immediate delivery; largest stock in London.

**PHENIX** Sidecars.—100 complete sidecars always in stock; Harley and American models.

**PHENIX** Sidecars.—Coachbuilt from £8/5, wicker and cane from £5.

**PHENIX** Sidecars.—We make special models for American motors from 11 gns.

**PHENIX** Sidecars on Hire; exchange made; good prices allowed for other makes.

**PHENIX** Sidecars, second-hand. We have always a large selection from 50/-.

**PHENIX** Sidecar Bodies.—Special line in coachbuilt from £2/5; own make.

**PHENIX** Sidecar Bodies.—Guaranteed largest stock in London; several stock-soiled and clearance.

**PHENIX** Sidecars.—Largest and most varied sidecar and body catalogue published.

**PHENIX** Sidecars are manufactured throughout in our own works; originators of the Phoenix Trimotorcar, popular throughout the world.

**PHENIX** Sidecar Dept., Proprietors Phoenix Motors, Ltd., 736, Holloway Rd., and 4, 5, 6, Criterion Mews, London, N. Tel.: Hornsey 449. T.A.: Sycamore, Upholl, London. [2218]

**FORECAR**, complete, basket, would easily make sidecar; 15/-.—Linfoot, Ramsgate Forge, Stockton-on-Tees. [8061]

**BRAND** New Latest Light Underslung Coach Sidecar, suit any motor; £6.—Taylor, 637, Seven Sisters Rd., Tottenham. [8084]

**CANE** Torpedo Sidecar, side entrance, quick detachable fittings, 26x24 wheel; £2/7/6.—1, Acacia Rd., Earlsfield, S.W. [8201]

**SIDECAR**, canoe shape, upholstered, chassis and tyres, complete, as new, guaranteed; 55/-.—Morris, 138, Marlborough Rd., Hightown, Manchester. [X8173]

**SIDECARS**—Several bullet-shaped coachbuilt bodies, with or without chassis, cheap.—Write, Stokes and Holt, Ltd., Belgrave Rd., Leicester. [0718]

**MIDDLETON** Sidecar, coachbuilt, underslung, dark green, new Clincher, perfect condition, 4-point attachment; £6/10.—20, Valney St., Tooting. [8052]

**SPECIAL** Sidecars to suit American Excelsior and Harley-Davidson; Cape hoods 30/-, wind screens 17/6; splendid value in lightweight model at £8.—Melville Sidecars, Halifax. [X1034]

**NEW** Phoenix Coachbuilt Sidecar, rainproof cover, used once, £7 for quick sale; also last year's Indian coachbuilt sidecar, cost 20 gns., accept £9, bargain.—A.B.C., c/o Birch, High St., Ashford, Kent. [8133]

**BEAUTIFULLY** Finished Coach Sidecar, Harley-Davidson colour, complete with apron, 18 gn. model, sacrifice £12; lightweight coach sidecar, suitable for 1½ to 3 h.p. machines, complete with apron, 8 gns.; beautiful underslung cane sidecar, Rex pattern, brand new 16 gn. model, 9 gns.; torpedo side-entrance wicker sidecar, almost new, £4; absolutely honest bargains.—Kay, 6, Lorenzo St., Pentonville Rd., London, W.C. [X8262]

## BODIES.

**BASTONE'S** for Bodies.—New cigar pattern, wicker and rush; 45/- each.

**BASTONE'S**—New lightweight coachbuilt bodies; splendid; £3.

**BASTONE'S**—Special offer: new best quality coachbuilt bodies; £3/15, worth double.

**BASTONE'S**, 228, Pentonville Rd., King's Cross, London, N. [8206]

**HANDSOME** Coachbuilt Torpedo Underslung Sidecar Body, dark green, new; £3.—Apply after 7, 142, Matcham Rd., Leytonstone. [8101]

## CYCLE CARS.

**1915** Saxon, 4-cyl., Bosch mag., quite new; accept £120, or motor cycle part.—Box 9,854, c/o The Motor Cycle. [X8226]

**G.W.K.** Light Car, 1916, latest model, just arrived from works; immediate delivery; £178/10.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7951]

**MORGAN**, Grand Prix, 1915, water cooled, 700x80 tyres, Lucas lamps and horn, Wafford speedometer, equal to new; £110, or near offer.—Mylam and Co., 197, London Rd., W. Croydon. [8193]

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## Actually in Stock.

B.S.A., Model K, and No. 2 Sidecar ... £80 18

JAMES, 4½ h.p., 3 sp. combination ... 80 0

INDIAN Powerplus, Model F, electrically equipped ... 90 0

INDIAN Powerplus, Model G ... 75 0

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NEW HUDSON, Big Six Combination, lawn finish ... £92 8

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LEVIS, No. 1 (2 in stock) ... 36 17

LEVIS, Popular (2 in stock) ... 28 1

WOLF, 2½-3 h.p., 2-stroke ... 25 8

NEW IMPERIAL—J.A.P., 2 speed ... 35 Gns.

ALLDAYS ALLON (3 Models in stock), from ... £34 0

MORGAN Runabout, M.A.C.G. engine ... 110 0

## SECOND-HAND

In Tip-Top Order, with all Accessories.

1913 LEVIS Popular ... 20 Gns.

1914 CLYNO, 6 h.p., and 2-seater sidecar ... £69 10

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1913½ P. & M. Solo ... 40 Gns.

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1914 TRIUMPH, 3 speed ... 49 10

1913 TRIUMPH, 3 speed ... 41 10

1915 WOLF, 4 h.p., combination, shop-soiled only ... 50 Gns.

1915 CALTHORPE, 2-stroke, shop-soiled only ... £25 0

1915 CALTHORPE, 2-stroke, 2 speed, shop-soiled only ... 29 0

1912 B.S.A., clutch model, and light Montgomerysidecar ... 33 0

1915 SAXON, 11 h.p., 2-seater light car ... 120 0

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1913 CROUCH, 8-10 h.p., 3-seater light car ... 60 Gns.

Sidecars of Leading Makes  
Generous EASY TERMS.

## D.C. LAMB

161, High St., Walthamstow, London, N.E.  
Phone—169, Walthamstow.

60, High Road, Wood Green, — London, N.  
Phone—169 Hornsey.

## CYCLE CARS.

**CALCOTT**, 10.5h.p., 1916, latest model, the leading light car, dynamo lighting set, and all complete; just arrived from works; immediate delivery.—Wilkins, Simpson, and Co., 24, Sheet St., Windsor. [7950]

**8 h.p. J.A.P.** Water-cooled Engine, back axle, with 2-speed gear and connections, set of wheels complete with Palmer tyres, pair of side frames, silencer, and radiator, ready for being assembled to make a cycle car; what offers?—The Royal Ruby Cycle Co., Manchester. [0705]

## CARS FOR SALE.

**FORD** Motor Car, good, cheap, scarcely used.—Box L366, c/o The Motor Cycle. [8038]

**BAVEY** Peugeot, 1914, 4-cyl., light; £97/10.—At Wauchope's, 9, Shoe Lane, London. [X8253]

**PALMER'S** Garage and Motor Auction Rooms, 183, 185, 187, and 189, High St., Tooting.

**PALMER'S** Garage, Tooting.—The pre-eminent place for purchasing. Auction sales fortnightly.

**PALMER'S** Garage, Tooting.—6h.p. Rover, 2-seater, exceptionally good condition; £30.

**PALMER'S** Garage, Tooting.—12-14h.p. modern F.I.A.T., sporting 2-seater, £85; one also, £150

**PALMER'S** Garage, Tooting.—12-14h.p. F.I.A.T., light, modern landalet, very economical; £175.

**PALMER'S** Garage, Tooting.—18-22h.p. new 1916 latest model Maxwell, 4-seater; £235.

**PALMER'S** Garage, Tooting.—20b.p. Ford, 1914, 2-seater, splendid order throughout; £75.

**PALMER'S** Garage, Tooting.—20h.p. Standard, ¾ landalet, superb carriage; bargain, £200.

**PALMER'S** Garage, Tooting.—Write at once for dual catalogue. Post free. 500 automobile bargains. [8187]

**SWIFT**, 1914, 7h.p. twin, 2-seater; no defects; splendid running condition; seen any time.—Stanley, 56, Stamford Hill, N. [8076]

**BAVEY** Peugeot, 8 h.p., 2-seater, 3 lamps, hood, screen, in excellent condition; any trial, 55 gns. or near offer.—441, Brighton Rd., South Croydon. [8085]

**G.W.K.**, 1913, hood, screen, 2 head, side and tail lamps, speedometer, horn, tools, etc.; at present being overhauled; £100; tuition free.—Rex Mundy, 132, Gt. Portland St., W. [7999]

**1911** Darracq Brougham 14-16h.p., in splendid condition; £65, or would exchange.—Tuke and Bell, Ltd., Motor Department, Carlton Engineering Works, High Rd., Tottenham, N. [8067]

**HUMBERETTE**, 1914, water-cooled, hood, screen, 2 head, side and tail lamps, speedometer, horn, Stepney, tools, etc., 700x80 tyres, in excellent condition; £95; tuition free.—Rex Mundy, 132, Gt. Portland St., W. [7998]

**1910** Porthos, 14-16h.p., 4-5-seater open touring car, extremely silent and flexible running, in excellent condition; £54; any trial given.—Tuke and Bell, Ltd., Motor Department, Carlton Engineering Works, High Rd., Tottenham, N. [8066]

## EXTENDED PAYMENTS.

**EXTENDED** Payments.—All makes supplied; lowest terms.—Service Co., 292, High Holborn, London. [0613]

**EXTENDED** Payments arranged on new motor cycles of all best makes.—Wauchope's, 9, Shoe Lane, London. [X8250]

## ENGINES.

**31½** h.p. Engine, perfect, with C.L. frame; £3/10.—47, High St. South, Rushden. [X8192]

**7-9** h.p. White and Poppe 2-cyl. M.O.V. Engine; £5/10.—Phippe, Monks Path, Shirley, Birmingham. [X8263]

**J.A.P.** 6h.p. Engine, brand new, £16/10; and new Bosch magneto, £5.—2, Kingswood Rd., Penze, S.E. [7986]

**2½** h.p. Minerva, mechanical valves, less cylinder and piston, guaranteed perfect; 17/6.—Homestead, Birchington. [8151]

**BASTONE'S**—Peeco 2½h.p. 2-stroke engine, £5/15; Rex 10h.p. twin V type water cooled engine, £9/15.—228, Pentonville Rd., King's Cross, London, N. [8202]

**2** h.p. Zedel Air-cooled Engine, £2; 4h.p. Stevens, £6/10; 3½h.p. Brown, m.o.v., £5/10; 3½h.p. Ariel, m.o.v., £5; 3½h.p. Premier twin, complete with mag., carburettor, and silencers; £12; 4-cyl. J.A.P. cycle car engine, air-cooled, fitted mag., carburettor, flywheel and clutch, £24.—Murray's, 37a, Charles St., Hatton Garden, Holborn. [X8313]

## IGNITION APPLIANCES.

**BASTONE'S** for Magnetos.—New Bosch D.A.V. twin, set 50/-, anti-clock, £3/17/6.

**BASTONE'S**—New Bosch single-cyl., £3/17/6. We have a large stock of 2, 4, and 6-cyl. magnetos at low prices.—228, Pentonville Rd., King's Cross, London, N. [8204]

**PARKER** and Rice, Magneto Specialists.—Experts on all magnetos, Bosch, Eisemann, etc.

**PARKER** and Rice.—Re-winding, re-magnetising, overhauling, etc.; repairs executed with expedition and unapproachable workmanship; low quotations.

**IMPORTANT**—Parker and Rice give 12 months' written guarantee with each repair.

**PARKER** and Rice, John's Place, King St., Acton, London. Phone: Chiswick 1518.—State your trouble. Let us quote you. [4292]



## IGNITION APPLIANCES.

**SEND** Your Magneto Repairs to the Runbaken Magneto Co., Ltd., Camp Street Works, Deansgate, Manchester. 'Phone: 8266 City (3 lines). T.A.: Runnag, Manchester.

**REPAIRS.**—The Runbaken Magneto Co., Ltd., have the largest and best equipped works in this country for dealing with this class of work. Moderate charges. Can return within 24 hours.

**SPARES** Department.—We can supply from stock all spare parts for Bosch, Eisemann, Mea, U.H., etc. Send for illustrated booklet.

**THE** Runbaken Magneto Co., Ltd., Camp Street Works, Deansgate, Manchester. 'Phone: 8266 City (3 lines). T.A.: Runnag, Manchester. Call or write. [0404]

**MAGNETO** Repairs and all spare parts.—The Runbaken Magneto Co., Ltd., Camp St. Works, Deansgate, Manchester. Tel.: 8266 City (3 lines). T.A.: Runnag, Manchester. [0715]

**MAGNETO** Repairs by Manufacturers; all repairs guaranteed; spare parts for any make; prompt delivery.—Kenyon and Torrance, 399, Gt. Western St., Rusholme, Manchester. 'Phone: 362 Rusholme. [6407]

**MAGNETOS**, Repairs, Spares.—Repairs to all types at our own works by experts. Re-winding, re-magnetising, spare parts for any make. Prompt delivery guaranteed.—Brooklyn Engineering Co., 1a, Bailey St., Pendleton, Manchester. [X8135]

**MAGNETO** Repairs.—The London and Paris Magneto Co., 154, Gt. Portland St., London.—Lowest prices compatible with good work. Avoid tinkering or excessive manufacturers' charges. Magneto's bought and sold.—'Phone: Gerrard 1908. [7637]

## BELTS.

**BASTONE'S**.—Best leather and chrome belting,  $\frac{3}{4}$  1/1,  $\frac{1}{2}$  1/2, 1 in. 1/4, 1 1/4 1/6 per foot.—228, Pentonville Rd., King's Cross, London, W. [8207]

**500** New Motor Cycle Belts, 8 ft. x 1 in., at 10/-; 7 ft. 6 in. x 1 in., at 9/-; 8 ft. x 7/8 in., at 9/-; 7 ft. 6 in. x 7/8 in., at 8/-; 8 ft. x 3/4 in., at 8/-; 7 ft. 6 in. x 3/4 in., at 7/-; 7 ft. 6 in. x 1/2 in., at 6/-; Forward fasteners free; approval before cash.—Deacer Motor, 69, Gower St., Birmingham. [X8145]

**BALATA-CHROME** Belts, highly satisfactory all weather;  $\frac{3}{4}$  in. 9d.,  $\frac{1}{2}$  in. 10d., 1 in. 1/-, 1 1/4 in. 1/2 per foot, post free. Extra strong belts for passenger work, with steel drilled eyelets and washers all through, 1 in. 1/6, 1 1/4 in. 1/9 per foot.—Pollin, Shepherdswell, Dover. [8220]

## TANKS.

**TANKS**, tanks, tanks, any shape, to order or repaired; all metal sidecar bodies; general sheet metal work; lists free.—Attwood's, 86, Rosebery Av., E.C. Tel.: Central 12445. [5136]

## TYRES.

**LEGGATE'S**, Edinburgh, for Tyre Value.

**LEGGATE'S**, Edinburgh.—For great reductions in brand new clearance tyres. See below for approval terms. Prompt despatch guaranteed.

**LEGGATE'S**, Edinburgh.—Clearance.—1915 new pattern Clincher Dreadnought, 6-ply fabric, extra heavy, rubber studded, beaded covers, 26x2 1/2 31/-, list 22/7 3/4; 26x2 1/2, to fit 2 1/4 rims, 31/6, list 22/7 3/4; 26x2 1/2 32/6, list 22/10/10.

**LEGGATE'S**, Edinburgh.—Clearance.—1915 new pattern Clincher de luxe, heavy rubber studded, beaded covers; 26x2 1/2, 21/-; 26x2 1/4, 21/-; 26x2 3/8, to fit 2 1/4 rims, 23/6; 26x2 1/2, 25/6.

**LEGGATE'S**, Edinburgh.—Clearance.—1915 new pattern Clincher de luxe, beaded edge, 4-ply fabric, special heavy, rubber studded, "added" non-skid pattern (not recessed) covers, 26x2 1/2, for 2 1/4 rims, 27/6; special value; absolutely "it" for greasy roads.

**LEGGATE'S**, Edinburgh.—Standard 1915 Clincher Dreadnought, 3-ribbed, 6-ply fabric, beaded covers, 650x65 39/9, 700x80 44/9, 700x80 for 650x65 rims 44/9; specially made for voiturette rims of extra powerful passenger outfits and light cars.

**LEGGATE'S**, Edinburgh.—Clearance.—1915 Dunlop extra heavy rubber-studded beaded covers, 26x2 3/8, 28/6, list 37/9; 28x2 1/2 (for Indians), 31/-, list 41/3; 28/3 (for Indians or Harley-Davidsons), 33/-, list 44/-.

**LEGGATE'S**, Edinburgh.—1915 Dunlop tubes, best quality, extra heavy, fully guaranteed, 24x2 6/6, 24x2 1/4 7/-, 26x1 1/4 6/6, 26x2 6/9, 26x2 1/4 7/9, 26x2 3/8 8/6, 26x2 1/2 8/9, 26x3 9/6, 650x65 10/6, 26x2 1/2 9/-, 28x3 10/6.

**LEGGATE'S**, Edinburgh.—These goods are all brand new, and sent anywhere on 7 days' approval against remittance; cash refunded in full if goods not approved of.

**LEGGATE** and Co., Motor Cycle Specialists, 15, Slatford Rd., Edinburgh. [X8327]

**TWO** 28x3 3-ply Extra Heavy Motor Cycle Dunlop Covers, B.E., almost new, only done 5 miles; 30/- each.—McSorley, Bridge St., Omagh. [X8231]

**7/6** Allowance Guaranteed for old tyre towards nearly all new motor cycle covers.—Particulars to Taylors', Tyre Stockists, Store St., London, W.C. [0626]

# The IVY Two Stroke

## Programme for 1916

The IVY—during the year 1915 has maintained its splendid reputation, and we are assured by letters from our clients that the little machines are giving every satisfaction. We take this opportunity of thanking those past and present riders of the IVY Two-stroke, whose kind patronage has enabled us to put before the public the aristocrat of its type, and to assure potential purchasers that for 1916, although only improved in detail, it is better than ever.

We are retaining all the models which have been such a success last season, viz.:—Tourist, De Luxe, and Lady's two-strokes, with or without 2-speed gears, and are introducing one new model—a 3 h.p. two-stroke (70 x 90) single-cylinder, which will be sold as a solo machine, and with a sidecar as a lightweight combination. This latter, however, will not be ready for delivery before February, 1916.

**Tourist Model** Fixed engine **£29 10**  
2 1/2 h.p. (64x70)  
Solo Machine. 2-speed **£36 0**

**De Luxe Model** Fixed engine **£34 0**  
2 1/2 h.p. (64x70)  
Solo Machine. 2-speed **£40 10**

**Lady's Model** Fixed engine **£31 0**  
2 1/2 h.p. (64x70)  
Solo Machine. 2-speed **£37 10**

**3 h.p.** single-cylinder two-stroke, 70 x 90 bore and stroke. Solo machine, and with sidecar as combination, with or without 2-speed gear. Prices not yet fixed; deliveries cannot be commenced before February, 1916.

## THE ARISTOCRAT OF ITS TYPE

**S. A. NEWMAN, Ltd.,**  
Aston Cross, Birmingham.  
LONDON—Service Co., Ltd.,  
High Holborn.

Advance 1916  
Folder post free—  
Catalogue will be  
ready shortly.

## TYRES.

**BASTONE'S**.—New clearance covers and tubes as below:

**BASTONE'S**.—Best English made rubber non-skid covers, B.E., 26x2 16/-, 26x2 1/4 17/6, 26x2 1/2 18/6, 26x3 19/6, 650x65, 21/-; ribbed pattern, W.E., 26x2 1/4 15/-; 26x2 1/2 17/-.

**BASTONE'S**.—Michelin covers, B.E., 26x2, 11/-, list 14/9.

**BASTONE'S**.—Michelin standard heavy covers, 26x2 16/6, list 29/-; 26x2 1/2 or 650x65, 19/6, list 36/6.

**BASTONE'S**.—Michelin Somele steel-studded, 26x2 22/6, list 37/6; 26x2 1/2 or 650x65, 25/6, list 44/-.

**BASTONE'S**.—Britannic rubber-studded, 26x2 1/4, 15/6.

**BASTONE'S**.—Peter Union heavy covers, 26x2 1/4, 17/6, list 28/9; 26x2 1/2, 18/6, list 31/6.

**BASTONE'S**.—Peter Union twin ribbed heavy covers, 24x2 1/4, 19/6, list 30/3; 26x2, 19/6, list 29/3; 26x2 1/4, 22/-, list 31/9; 26x2 1/2, 25/-, list 34/3.

**BASTONE'S**.—Peter Union rubber-studded, heavy, 26x2 1/4, 26/-, list 36/-; 26x2 1/2, 27/6, list 38/-.

**BASTONE'S**.—Continental combination, 26x2 1/4 36/- (list 50/-), 26x2 1/2 39/6 (list 54/6), 26x3 45/- (list 62/9).

**BASTONE'S**.—Hutchinson passenger covers, wired edge, 26x2 1/4 25/-.

**BASTONE'S**.—New 1915 Michelin covers, beaded, 26x 1 1/2 11/6, 26x2 14/9, 26x2 1/4 16/-, 26x2 1/2 18/-, 28x2 16/6, 28x2 1/4 17/-; also wired edge in stock.

**BASTONE'S**.—New 1915 Michelin tubes, 26x1 1/4 5/-, 26x2 6/9, 26x2 1/4 7/9, 26x2 1/2 8/6, 28x2 8/9; butted, 26x2 8/6, 26x2 1/4 9/6, 26x2 1/2 10/3, 28x2 10/6, 28x2 1/4 11/3.

**BASTONE'S**.—Guaranteed red tubes, 26x2 4/6, 26x 2 1/4 4/9, 26x2 1/2 5/-, 26x3 7/-, 26x2 1/4 6/6.—228, Pentonville Rd., King's Cross, London, N. [8205]

**REDUCED** 1915 List Tyre, all makes.—T.A.: Tyres.—Graham, Vice St., Birmingham. [0658]

**ECONOMIC**.—650x65 Pillion rubber studded covers, 18/-, listed 50/-; we hold written testimonials of over 9,000 miles for these.

**ECONOMIC**.—Kempshall, steel studs, in fibre, 650x 65 55/-, 700x80 65/-; unapproachable for heavy sidecar combinations; fully guaranteed; carriage paid.

**ECONOMIC**.—Kempshall clearance non-skids, 26x2 1/4 35/-, 26x2 3/8 38/-, 26x2 1/2 40/-, 28x3 50/-, carriage paid.

**ECONOMIC**.—Kempshall clearance anti-skids, 26x2 22/-, 26x2 1/4 24/6, 26x2 1/2 25/6, 26x2 3/8 26/6; 28x2 1/2 27/6, 28x3 35/-, carriage paid.

**ECONOMIC**.—Avon clearance, 26x2 Stonehenge, Druid, and rubber studded, 16/9; 26x2 1/4 Druid Invicta and rubber studded, 17/6.

**ECONOMIC**.—Clincher 24x2 heavy 4-ply De Luxe covers 19/6, tubes 5/6, complete tyre 24/-.

**ECONOMIC**.—Continental 4-ply heavy Model de Course, 26x2 1/4 18/6, 26x2 1/2 18/-; special to clear

**ECONOMIC**.—Continental, 26x2 1/4 wired, 10/6; special price per pair, 17/-; fit 26x2.

**ECONOMIC**.—Clincher 3/4 section belting, in 7 ft. lengths, 11d.; 2-piece belts cut any requirements.

**ECONOMIC**.—Continental hitting, 3/4 11d., 1 in. 1/3; Shamrock-Gloria, 3/4 1/-, 1 in. 1/2; fasteners free all belts.

**ECONOMIC** Tyre Co., 137, Lewisham High Rd., New Cross. 'Phone: New Cross 1393. Special clearances. Close 1 Thursdays, 8.30 Saturdays. [8230]

## GARAGES.

**BEAUFORT** Garage.—Motor cycles, 1/- weekly: cars from 5/- weekly; petrol, oils, tyres, repairs.—97, Drayton Gardens, South Kensington. [8224]

## PATENT AGENTS.

**HENRY SKERRETT**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs. Motor patents a speciality. [0636]

## INSURANCE.

**FOR** Insurance of all kinds (speciality motor), apply, Ernest J. Bass, Insurance Broker, Bishops Stortford. [0693]

**WHY** Pay Your Insurance Premiums a year in advance, when you can pay them monthly without extra cost? Lowest rates, Lloyd's policies.—General Insurance, 199, Piccadilly, W. [7734]

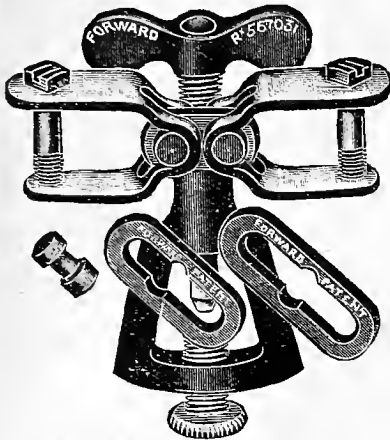
## SITUATIONS VACANT.

**SHORTHAND-TYPIST**, male or female, for motor cycle trade; state wages and experience; permanent position.—Box L380, c/o The Motor Cycle. [0479]

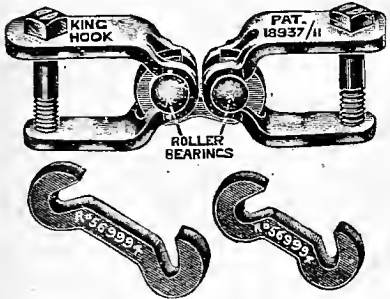
**WANTED**, a motor cycle repairer, must be eligible for military service, permanency; no one engaged on Government work or living more than 10 miles distant need apply.—Apply, Vauchope's, 9, Shoe Lane, Fleet St., London. [X8251]



# 1916

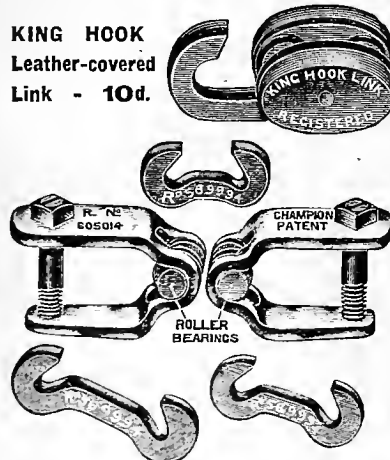


**FORWARD Adjustable Fastener 1/6**  
**FORWARD Leather-covered Link 1/-**  
**FORWARD Belt Punch - - 2/-**



**KING HOOK Detachable Fastener 1/-**  
**KING HOOK Adjustable Fastener 1/3**

**KING HOOK**  
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**Link - 10d.**



**CHAMPION Detachable Fastener .. 9d.**  
**CHAMPION Adjustable Fastener .. 1/-**

## AGENTS AND FACTORS

be sure and list  
these popular lines.

**FORWARD MOTOR CO.,**  
**SUMMER ROW, BIRMINGHAM.**

Makers of Forward British Plugs.

## FINANCIAL.

**PARTNERSHIP.**—Exceptional opportunity offered lady to take share in a business capable of great extension, and showing handsome profits on business already done. £500 to £1,000 can be profitably employed. Money under own control. Minimum £3/10 per week guaranteed. Of special interest to lady cyclists. Proof of bona-fides can be submitted to *The Motor Cycle*. No agents.—Address, Box L378, c/o *The Motor Cycle*. [8081]

## CONSULTING ENGINEERS.

**REX MUNDY**, after eight years' competition riding experience, offers expert advice on selection of new and second-hand motor cycles and light cars. Second-hand machines examined and reported on. Tuition. Moderate fees.—132, Gt. Portland St., W. [7112]

## TUITION.

**ARMY** Motor Cyclists.—Do you wish to join the army as a Despatch Rider. I am a motor cycle expert, and will make you a practical driver in 4 hours.—Apply, the Motor Cycle Expert, 28, Ellerby St., Fulham Palace Rd., Fulham. Tel.: 551 Putney. [8170]

## WANTED.

**A.**  
**MORGAN** and Maxwell purchase for spot cash approved second-hand or new motor cycles, light cars, combinations, sidecars, etc.—Morgan and Maxwell, The London Motor Mart, 80, High Rd., Streatham. [9747]

**ACCESSORIES.**—Morgan and Maxwell, Streatham. [X2560]

**1915** 2-stroke, 2-speed; cheap.—Letters, 204, Brownhill, Cardiff. [8070]

**2-SPEED** Gear, for F.N., cheap.—Smyth, Glenvar Howth Rd., Dublin. [X8292]

**SOUND** 8hp, Minerva Cylinder.—370, Hornsey Rd., Holloway, London, N. [8072]

**WANTED**, 2-cyl., mag., 50°.—Bennett, 41, Derby Rd., Ponder's End. [X8261]

**3 1/2hp** Peugeot Cylinder, 1912 pattern.—Williams, 14, 2 Midland Av., Nottingham. [X8285]

**TRIUMPH**, cheap for cash; not over £20.—Bell, 49, High St., Kingston, Surrey. [X8151]

**LIGHT** Car or cycle car, modern, good, and price reasonable.—Bunting, Harrow. [8091]

**F.N.** Lightweight, not earlier than 1913; cheap.—Jordan, Thatches, Braughing, Herts. [8217]

**FAMILY** Wicker Sidecar Body, cheap for cash.—Jones, Broadway, Newbury, Berks. [8042]

**WAUCHOPE'S** Buy Motor Cycles for spot cash.—Wauchope's, 9, Shoe Lane, London. [X8254]

**WANTED**, 6hp, Zenith, 1914 or later; lowest cash.—294, Kennington Park Rd., S.E. [X8317]

**WANTED**, 3 1/2hp, engine, not earlier than 1912.—Worsdall, Salthouse Lane, Hull. [X8080]

**WANTED**, for 4hp, F.N., 3-speed gear box.—W. Smyth, Glenvar Howth Rd., Dublin. [X8293]

**SOUND** Back Cylinder and Piston, for 1910 Rex; approval.—33, Roseville Terrace, Leeds. [X8265]

**WANTED**, Popular Levis, or other modern lightweight.—13, Abbey Drive E., Gimsby. [8032]

**100** Motor Cycles wanted; spot cash paid; bring or send.—Palmer's Garage, Tooting. [8188]

**WANTED**, at once, good combinations, also solo mounts.—Box L384, c/o *The Motor Cycle*. [8238]

**WANTED**, magneto, single, guaranteed sound, cheap.—Goodall, Knowl Hill, Twyford, Berks. [8015]

**WANTED**, 4hp, A.J.S., or 1915 Triumph.—Smith, Kenilworth, Ricehey Rd., Egremont, Cheshire. [8098]

**WANTED**, Druids, heavy, 6in. head, lin. bars; cheap, approval.—Wilkinson, Twigg, Doncaster. [X8092]

**WANTED**, J.E.S. auxiliary cycle, or similar set, complete, sound, cheap.—Fenton, Kirtton-in-Lindsey. [X8166]

**WANTED**, little lightweight, very cheap, about 2 h.p.; cash.—Cur-on, Townhead, Eym, Sheffield. [X8186]

**WANTED**, w.c. V twin engine, 5-8h.p., gears, steering wheel.—Sanders, Coopers Hill, Alvechurch. [X8229]

**WANTED**, 26x2 front wheel, sound, with tyres (optional).—Banwell, Heath, Leighton Buzzard. [X8279]

**WANTED**, speedometer, in good condition; cheap.—Blencathra, Highfield Rd., Walton-on-Thames. [X8276]

**WANTED**, Douglas, or other good make, cheap.—Letters, 436, Whitehorse Rd., Thornton Heath. [8163]

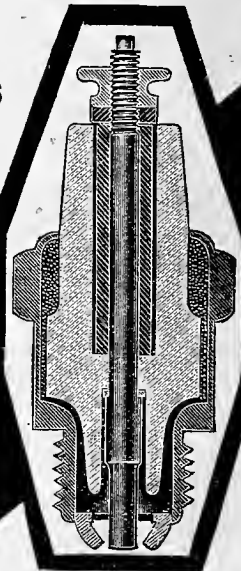
**WANTED**, suitable gear box for Chater-Lea twin, also silencer and pipes.—125, London Rd., Manchester. [10718]

**GOOD** Make Motor Cycle, 1914 or 1915, with gears preferred; cash waiting.—Box L382, c/o *The Motor Cycle*. [8236]

**DOUGLAS** (1912 or 1913), Triumph, Rover, or similar machine, for cash.—Empson, Gamlingay, Sandy. [8094]

# A NEW YEAR AND A NEW PLUG

1916

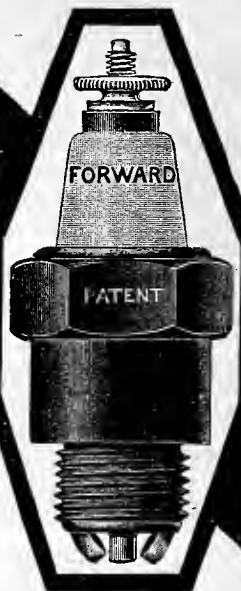


Pro.  
Patent.

## FORWARD TYPE M

The outer insulator is permanently welded to steel body by patent enamel, making an absolutely and permanently gastight joint. Within this outer insulator is fixed a second insulator composed of mica. Should the outer insulator, therefore, get accidentally cracked or broken, the spark would not be affected in the least.

3/6  
EACH



Insist  
on  
Forward  
British  
Plugs.

**FORWARD Motor Co., Summer Row, B'ham**  
**The Plug Specialists.**

# OUR WEEK-BY-WEEK TALKS ON BELT DRIVE

JAN.  
6.

AT THIS PERIOD of the year you may perhaps be troubled by belt slip. Belt slip, of course, is really only a manifestation of the fact that belt drive is the right form of transmission for a motor cycle. The power of the engine being temporarily greater than the driving wheel can convert into forward movement, owing to the holding nature of the road surface, the normal cushioning of the drive, which protects the whole machine from transmission shocks, develops into belt slip. To avoid this, retard the ignition slightly, and do not open the throttle suddenly. It will be found helpful, too, to fit a

## STANLEY "SPARE LINK"

which grips the engine pulley all the way round.



Fits any hook fastener. Costs 1/-

If there is anything you wish to know about belt drive, WATCH THIS SPACE, or write us direct. Our experience is at your service.

Send a postcard for two interesting booklets.

## STANLEY MOTOR BELT AND FASTENER CO.

(Inventors of the Original Hook Fastener  
and other practical Belt Aids),

(Stanley Webb, Manager),

BROMLEY, KENT.

## FLYING MEN

can obtain commissions in the R.F.C. & R.N.A.S.  
It is worth your while to

LEARN TO FLY

AT



THE

## RUFFY-BAUMANN SCHOOL OF FLYING.

Write to Dept. B—

London Aerodrome, & KENDALL'S MEWS,  
Hendon, N.W. & Portman Square, W.

Phone: 151, Kingsbury.

\*Phone: 6046 Mayfair.

### WANTED.

WANTED, recent motor cycle, 25-31 h.p.; no garage offer.—Henry Arthur, 38, Denton Rd., Twickenham. [8048]

WANTED, motor cycles; spot cash.—Wandsworth Motor Exchange, Ebner St., Wandsworth Town Station. [8420]

WANTED, fixed engine, B.S.A., Triumph, or Rudge motor, any condition.—Jones, Evelitte Mill, Shifnal. [8149]

LEVIS, Enfield, or other 2-stroke, recent date, must be in good condition.—Robinson, 60, Yorkshire St., Oldham. [8275]

WANTED, Sturmer-Archer hub gear wheel and fittings, perfect condition.—Wright, 63, St. Leonard-gate, Lancaster. [8147]

WANTED, motor cycles, combinations; cash or sale on commission.—Watts and Co., 2a, Argyle Rd., West Ealing, W. [8077]

WANTED, immediately, second-hand sporting cancellet Scott, purple finish, good condition.—Box 9,851, c/o The Motor Cycle. [8207]

WANTED, chain drive combination, good condition; also lightweight; private; spot cash.—Box 9,846, c/o The Motor Cycle. [8171]

ARMSTRONG or Sturmer-Archer Gears or gear parts bought for cash.—Motorist, 33, Lingard Rd., Northenden, Cheshire. [7641]

MOTOR Cycle, 31 h.p., or above, must bear expert examination.—Write, Boys, 7, Northumberland Rd., Lintford, Essex. [8037]

WANTED to hire, for about 6 days during leave expected shortly, sidecar outfit.—E. Gater, M.T.C., A.S.C., 363 Co., B.E.F. [8060]

WANTED, a few good lightweights; cash, exchange, sale on commission.—Watts and Co., 2a, Argyle Rd., West Ealing, W. [8078]

BEAUFORT Garage.—Motor cycles purchased for cash or sold on commission.—97, Drayton Gardens, South Kensington. [8225]

SECOND-HAND Motor Cycles, purchased for cash. Send particulars and lowest prices.—Service Co., 292, High Holborn, W.C. [0679]

WANTED, late model 6 h.p. twin or 4 1/2 h.p. single, countershaft preferred, about £30, sidecar £35.—Wilcox, Chasity, Holworthy. [8319]

WANTED, second-hand machine, good condition, Triumph, Rudge, or Zenith, sidecar immaterial.—Fernlea, Hillcrest Rd., Acton. [8252]

WANTED, first-class motor cycle or combination, 3 speeds.—Fuller's particulars, lowest price, Roseville, 11, College Rd., Reading. [8027]

MAGNETOS Wanted, second-hand or new, any condition, for cash; best prices given.—Parris, 13, Hardwick Rd., Chiswick Park, London, W. [1429]

WANTED, cylinder and piston, 31 h.p. Triumph, 1906 model; state price and condition.—F. Matthewman, Salutation Inn, High Green, near Sheffield. [8169]

EAGLES and Co., 275, High St., Acton, will purchase second-hand motor cycles for immediate cash; also N.S.U. gears in any condition.—Tel. 556 Chiswick. [8220]

WANTED, good second-hand lamps, horns, speedometers, and other modern accessories.—Particulars and lowest price for cash, Service Co., 292, High Holborn, W.C. [0743]

WANTED, old obsolete cars, electric, steam, or petrol, and old engines, old scrap brass, and aluminium, good prices given.—Hawkins, 385, York Rd., Wandsworth. [8166]

WANTED, new or second-hand Villiers 2 1/2 h.p. 2-stroke engine, complete with belt and pulley; must be in perfect condition.—Wright, 10, Ashgrove Terrace, Gateshead. [8294]

LONGMAN Bros., 1, King St., Acton, are open to accept a few good second-hand machines for sale on commission. Customers waiting. Or we are open to buy for cash, exchange, or taken in part payment. [8251]

WANTED, engines, magnetos, carburettors, Armstrong and other speed gears, tyres, lamp sets, speedometers, motor cycles, for cash; exchanges arranged.—Cooper, 1, Stroud Green Rd., Finsbury Park, London, N. [8153]

SEND your motor cycle to Palmer's Garage, Tooting, Wimbledon Station (L. and S.W. Railway), per goods, or Tooting Junction, passenger train. Cash offer will be telegraphed immediately on receipt of machine. Machine can be included in fortnightly auction without charge if offer not accepted. Reserve price may be fixed.—Sole address, Palmer's Garage and Motor Cycle Auction Rooms, 183, 185, 187, 189, High St., Tooting. [8189]

WANTED, any number of solo motor cycles, combinations, cycle cars, light cars, magnetos, speed gears, speedometers, carburettors, etc. We purchase suitable machines for cash, exchange, or sell on commission. Send us particulars; many clients on waiting list. Being one of the world's largest motor distributors, we have the largest clientele, and obtain and give the highest prices. Valuation, tuition, insurance. Low cost.—Morgan and Maxwell (Established 1893), The London Motor Mart, 80, High Rd., Streatham, London. [X1252]

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LIGHT  
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NEW IMPERIAL J.A.P., 2 1/2 h.p., 2-sp., clutch, lady's .....	£43 1
ZENITH, 4-5 h.p., twin clutch .....	£73 18 6
ALLDAYS Allon, 2-speed, 2-stroke .....	£42 0
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DOUGLAS, Model W, 3-speed, clutch .....	£56 14
DOUGLAS, War Office Model .....	£54 12
DOUGLAS, Model V, 3-speed .....	£52 10
DOUGLAS, Model V, 2-speed .....	£50 8
DOUGLAS, Model U, 3-speed .....	£52 10
DOUGLAS, Model U, 2-speed .....	£50 8
B.S.A., 4 1/2 h.p., 3-speed, chain drive .....	£64 0
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### Second-hand Bargains.

1914 RUDGE, 5-6 h.p., 3-speed .....	£45
1914 A.J.S., 5-6 h.p., 3-speed Combination .....	£70
1915 DOUGLAS, T.T., 2 1/2 h.p., 2-speed .....	£45
1915 HENDERSON, and Swan Sidecar .....	£80
1914 INDIAN Combination, 7-9 h.p., 2-speed .....	£60
1914 DOUGLAS, T.T., 2 1/2 h.p., 2-speed .....	£40
1914 RUDGE, 5-6 h.p., shop-soiled .....	£45
1914 LITTLE GIANT, 2 h.p., 2-sp., lady's .....	£20
1914 INDIAN, 7-9 h.p., 2-sp., and coach S'car .....	£58
1915 ZENITH, 5-6 h.p., clutch and Sidecar .....	£48
1913 RUDGE, 3 1/2 h.p., Philpott pulley .....	£27
1912 MOTOACOCHE, 2 1/2 h.p. ....	£15
1914 SCOTT Comb'n, 3 1/2 h.p., twin, 2-stroke .....	£40
1915 JAMES, 4 1/2 h.p., and James Canoelet Sidecar .....	£65
1912 TRIUMPH, 3 1/2 h.p., free engine .....	£27
1915 3-speed HARLEY-DAVIDSON .....	£50
1914 2-speed 3 1/2 h.p. Twin LEA-FRANCIS .....	£48
1913 5-6 h.p. A.J.S. and coach Sidecar .....	£52
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1914 MORRIS-OXFORD .....	£160
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1913 FORD, 4-seater .....	£70
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1915 CALTHORPE J.A.P., 2-speed; list price £36 15; shop-soiled	28 gns.
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1916 Powerplus INDIAN and Sidecar	£96 0
1916 6 h.p. ENFIELD and Sidecar	85 gns.
1916 5 h.p. INDIAN, 3-speed	£70 0
1916 B.S.A., 4½ h.p., chain-cum-belt	£62 0
1916 B.S.A., 4½ h.p., all chain drive	£64 0
1916 NORTON, T.T.	£52 10
1916 6 h.p. A.J.S., 3-sp., and Sidecar	£102 18
1916 4 h.p. A.J.S., 3-speed	£76 0
1916 LEVIS Popular	£32 0
1915 ROVER, 3½ h.p., countershaft	£66 10
1915 LEVIS, 2-stroke	£28 1
1915 O.K. Junior, 2-sp., very little used	21 gns.
1915 5 h.p. INDIAN, 3-sp., new tyres, specially tuned, in beautiful condition	44 gns.
1915 NEW HUDSON, 2-stroke, good condition	24 gns.
1913 B.S.A., 2-speed	28 gns.
DOUGLAS, 2-speed, lamp, horn	17 gns.

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1916 OVERLAND 5-seater, practically equal to new	215 gns.
1915 FORD 5-seater, including carriage from works	£138 15
1916 MORGAN, sporting model, horn, lamps	£109 0

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BIGGEST MOTOR CYCLE AND LIGHT CAR  
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WANTED, magnetos, any condition, carburettors, Sturmev, Armstrong gears and parts, engines, lamps, speedometers, damaged motor cycles, etc., etc.—Grove, 224, Fore St., Upper Edmonton, London. [8155]

## EXCHANGE.

EXCHANGE 12h.p. Humber chassis, trader's lot, for Douglas, 1913, gent's; offers wanted £35.—Arnsby, Hadlow. [8218]

EXCHANGE 5-6h.p. 2-speed free engine combination, lightweight; sell £20.—Beer, 47, Windsor Rd., Penarth. [8164]

6 h.p. 1915 (July) New Hudson, sidecar, etc., like new; £70: exchange Morgan—Weldon, Devonshire Rd., Nottingham. [X8089]

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EXCHANGE 1914 7-9h.p. Indian, T.T. clutch model, for Douglas or Triumph, or sell £40.—Crosse, Jeweller, Rotherham. [X8273]

EXCHANGE.—Any make of motor cycle taken in part exchange for light cars.—Service Co., Featherstone Buildings, W.C. [0664]

WANTED, 2½h.p. 4-stroke power unit; exchange 3h.p. Omega 1914 2-stroke unit.—H. Williams, The Hoath, Edenbridge. [8022]

TANDEM SEAT Sidecar, C.B.; exchange for 1915 Sun model de luxe C.B. sidecar; cash either way.—Gill, Blacksmith, Colne. [X8289]

BABY Grand Piano (Kaps), cost £90; exchange good motor cycle and sidecar, or sell cheap.—Hough, 483, Bloxwich Rd., Leamore. [8137]

EXCHANGE 9h.p. single 2-seater Sizaire car for 2-stroke 2-speed lightweight.—S. Collings, 130, Hartley Rd., Radford, Nottingham. [8111]

LATHE, 3-speed, back motion, good; exchange for 1915 Binks, 3 heavy covers, and wind screen.—Motorist, Drumdeel, Strathgillie, Fife. [X8075]

11 h.p. Dudbridge Gas Engine, tanks, shafting, pulleys, belting, for motor cycle and sidecar or light car.—Harris, 12, Bath St., Bristol. [X8311]

6-8h.p. Twin w.c. Engine, mag., 2 brass radiator tanks, carburettor, perfect; £6/10; exchange anything useful; stamp, reply.—Scoones, Bluetown, Sheerness. [X8136]

ARGYLL Car 4-seater, Aster twin engine, accumulator ignition, 3 speeds and reverse, good condition; exchange good 2-stroke.—Bramley, Sarnitown, Dewsbury. [X8208]

BAT, 1914½, 8h.p., grey model, 3-speed countershaft, kick starter, chain drive, 20 gn. sidecar, accessories; exchange solo machine and cash.—Pigot-Disney, E. Molesey, Surrey. [8056]

SEVERAL 2-seaters, 4-seaters, chassis for sale; absolute bargains; list. Part exchange motor cycles entertained. Please call.—Liquidator, 106, Waylett Place, West Norwood, S.E. [X8324]

EXCHANGE 1914 4½h.p. James, 3-speed countershaft, chain, splendid condition throughout, for 1914 2-speed Douglas; sell £45; appointment.—R. Beynolds, Wimbington, Cambs. [8069]

2½h.p. Minerva Motor Cycle, good running order, B. 24 and B. carburettor, good tyres, smart appearance; £9; exchange gent's pedal cycle and cash.—Liafoot, Ramsgate, Stockton-on-Tees. [8062]

HOME-BUILT Cycle Car, chassis, ash, wheels, tyres, tubes, 6h.p. Rex, carburettor, axles, steering wheel, tanks, etc., wants finishing; exchange or offers.—S. Anscombe, Fire Station, Hurstpierpoint, Sussex. [X8309]

EXCHANGES are always best arranged at Maudes; most liberal terms and promptest deliveries. Many 1916 models now in stock.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. 'Phone: 552 Mayfair. [7842]

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A.J.S. Repairs are my speciality.—Youngs, 2 and 3, The Parade, 11th Rd., Kilburn. [6366]

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Retreads—same workman-  
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they are such a good invest-  
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EXCELSIOR, 1915, 7 h.p. model, electric lighting, horn, and speedometer, 1,000 miles	£59 10
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WILLIAMSON, 8 h.p., and Sidecar, shop-soiled; maker's price, £104	£89 0
WOLF J.A.P., 2½ h.p., 2-speed, shop-soiled	£33 10
REX 6 h.p. Sidette. Brand new	£67 10
REX 6 h.p. 1913 Sidette and accessories	£39 10
QUADRANT, 7-9 h.p., 1913, and Sidecar	£46 10
RUDE Multi, 1913, 3½ h.p.	£43 10
ROVER, 1913, 3½ h.p., 3-sp., Sidecar Com.	£43 10
REX, 1912, 6 h.p., 2-speed, 1913 engine	£28 10
BRADBURY, 1912, 3½ h.p., 2-speed	£27 10
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V.S., 6 h.p., P.M. 2-speed gear, and coach Sidecar	£22 10
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REX, 5½ h.p., magneto, twin, spring forks	£19 10
REX, 1910, 3½ h.p., 2-speed, and Sidecar	£19 10
PEUGEOT, 6 h.p., 3 speeds, fine order	£11 15
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REX, 3½ h.p., magneto, spring forks	£9 15
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2½ h.p. J.A.P.,  
2-speed Gear.MEDIUM WEIGHT.  
38 GUINEAS.

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**ARMSTRONG** Parts in stock.—Below.

**ARMSTRONG**—All parts in stock. Can post by return. Gears repaired promptly and efficiently.—County Engineering Co., Hounslow. [7589]

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**COWEY**, 60 m.p.h., 26x2 1/2 wheel, perfect condition; £2.—Wilkinson, Twigmoor, Doncaster. [X8093]

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CONTINENTAL COVERS.		Our Price.	Usual Price.
26x2 1/2	Ribbed .....	12/6	18/6
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26x2	T.T., basket pattern	16/9	23/3
26x2 1/2	" " "	19/-	26/6
26x2 1/2 x 2 1/2	" " "	20/-	28/-
26x2 1/2 x 2 1/2	" " "	20/9	28/9
26x2 1/2 x 2 1/2	" " "	20/9	28/9
26x2 1/2	" " heavy	24/6	34/-
26x2 1/2	" " "	27/-	37/6
26x2 1/2	Combination .....	36/-	54/6
650x65	Autobi basket pattern	25/-	39/6
650x75	rubber studded	31/6	44/3

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(Cannot advertise name.)  
 650x65 Pillion rubber studded 18/- 50/-  
 26x2 Special lightweight 13/9 20/6

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	(3-ribbed)		
24x2	De Luxe .....	19/8	28/-
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26x2 1/2 x 2 1/2	Dreadnought .....	35/-	40/-
26x2 1/2	De Luxe .....	21/-	39/-
26x2 1/2	De Luxe .....	23/6	30/9
26x2 1/2	A Won, rubber stud'd	21/-	35/-
26x2 1/2	A Won, rubber stud'd	22/6	37/6
26x2 1/2	Rubber studded, B.E.	17/6	—

(B quality)

26x2 1/2	A Won Ribbed, B.E.	13/6	—
650x65	De Luxe .....	30/-	40/6

## KEMPSHALL.

26x2 1/2	Heavy Non-skid ...	35/-	42/-
26x2 1/2	" " "	38/-	46/-
26x2 1/2	" " "	40/-	43/-
26x2 1/2	" " "	55/-	70/-
26x2 1/2	Heavy Anti-skid ...	24/6	32/6
26x2 1/2	" " "	28/-	38/6

## WOOD-MILNE.

26x2	Grip Rib, 3-ply ...	15/9	26/9
26x2 1/2	" " "	17/5	29/-
26x2 1/2	" " "	21/-	30/6
26x2 1/2	" " "	21/-	30/6
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26x2 1/2 x 2 1/2	" " "	25/-	36/-

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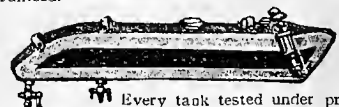
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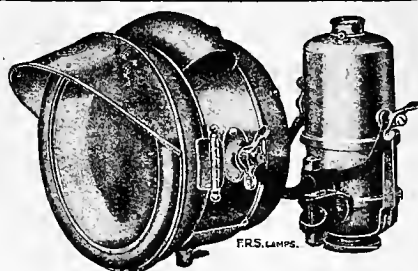
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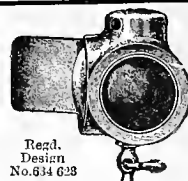
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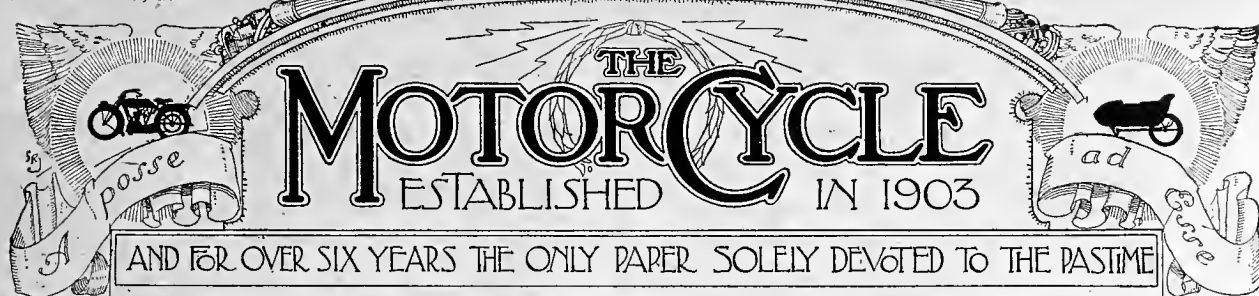
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Telegrams: "Cyclist, Fleet, London."  
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**Editorial Offices:**  
Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
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**Northern Offices:**  
199, Deansgate, Manchester.

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### Four-cylinder Motor Cycles.

**I**T is no new prediction of ours that the four-cylinder engine may yet come into general use on motor cycles. Any motor cyclist who is lucky enough to be intimately acquainted with the best which has yet been produced in four-cylinder cars cannot but be impressed by their controllability, their smooth and gliding motion, and must at some time have longed for a tiny four-cylinder motor cycle engine. Of course, we have had four-cylinder motor cycles for something like ten years past, but only in very small numbers. The original ones, which possessed automatic inlet valves, were by no means easy to keep in proper running order, but later specimens, embodying a more positive mechanically operated valve, have proved a decided improvement. Again, an extra cylinder in early days spelt so much more trouble, but this is not necessarily the case nowadays, with the rapid strides made in the longevity of all working parts, particularly in the case of the valves.

The growing popularity of the high-powered sidecar outfit directs our thoughts to the four-cylinder engine. With a miniature four-cylinder engine the friction losses are too great to make it a success; but in considering a capacity of approximately 1,000 c.c., an even-turning four-cylinder can be made a real success, if not a revelation, in smooth and quiet running. A four-cylinder engine would, as a matter of fact, overcome several shortcomings of the modern sidecar outfit. Primarily we have the comfort of the driver to consider. He is not in every case insulated from road shocks by a spring frame, and discomfort is a factor likely to increase rather than decrease in view of the abnormally heavy military traffic which is cutting up our roads. Therefore he would welcome a perfectly balanced engine and a vibrationless machine to help him out.

Another point lies in the difficulty, serious so far as a novice is concerned, in con-

trolling the speed of a small single or twin-cylinder engine when in the free position, either for changing gear or in traffic. A well-designed four-cylinder engine is wonderfully docile in this respect, and will turn over comfortably and quietly at a quite extraordinarily low rate of revolution.

Again, when once warm, no engine is easier to start than a four-cylinder. A movement of a kick starter over not much more than a quarter of a circle will set such an engine in motion, provided, of course, it is in reasonable adjustment. Carburation is simplified, and an automatic instrument is ideal. Against these advantages we have to consider the increased cost of manufacture; but it is probable that after the war cars and motor cycles will be assembled from parts, not made in oddments as in the past. Production in quantities will be the regular order. Thus, with improved manufacturing methods, there is a possibility that a four-cylinder engine properly designed would exceed by very little the cost of a V type engine built in small numbers. After all, a buyer would not grumble at a little increase, in view of the extra attractions. While writing the foregoing notes we had in mind the high-powered passenger outfit. At present we do not think the four-cylinder engine is called for in any numbers on motor bicycles on account of its weight and length, which necessitate a heavy and comparatively unwieldy solo mount. Later years, however, may well modify our views, for with aluminium pistons and aluminium cylinders in the air, and a consequent appreciable reduction in the weight of the power unit, there are all sorts of encouraging possibilities.

Having expressed the editorial view on the subject, we direct our readers' notice to an article in this issue on four-cylinder machines, written by "Ixion," than whom probably no motor cyclist has had more practical experience on the road with machines of every type and horse-power.

# Pros and Cons of the Four-cylinder.

By "IXION."

**E**XPLAIN the fact as we may, there is a persistent and increasing demand for the costlier and more luxurious types of motor bicycle, despite the formidable competition of cycle cars and light cars, and the improved speed, comfort, and climbing powers of the simpler and cheaper two-wheelers. This fact, coupled with a prolonged road trial of the American four-cylinder Henderson machine, has led me to wonder whether the next few years may not conceivably establish the four-cylinder motor bicycle as the standard machine *de luxe*, especially for sidecar work. The arguments on either side may be tabulated as follow.

## In Favour of the Four-cylinder.

(1.) Complete absence of engine vibration at all speeds on top gear, and at all speeds up to half throttle on the lower gears.

(2.) Absolute smoothness of drive with the rigid transmissions, the even torque of the engine enabling the drive to dispense with spring sprockets and cushion hubs.

(3.) Ease of starting. A modern machine must be startable from the saddle; under this limitation, a big twin calls for perceptible physical effort and a long stroke of the starting lever, even when every detail is in perfect order; the four-cylinder will start from warm with a movement of about 45° on the lever or pedal, and demands much less effort, as the compression to be overcome is reduced by 50%.

(4.) Elimination of gear changing. A four-cylinder resembles a steam engine in its flexibility, and can be driven at speeds ranging from 6 to 60 m.p.h. by the operation of a single lever, *i.e.*, the throttle; automatic carburettors, giving satisfactory results with four-cylinder engines, exist in great numbers. A three-speed gear is unnecessary; and the emergency ratio of the two-speed gear box will seldom be requisitioned.

(5.) Steadiness on grease. One would think that the long, heavy four-cylinder would take some holding up on bad surfaces; my experience points in the opposite direction, for the pull on the back wheel is so smooth and steady that the machine is as easy to hold up as a 100 lb. belt-driven baby two-stroke.

(6.) Continuous engine noise. It is common knowledge that the public taste will have nothing to do with two-cylinder car engines, however well balanced, because the irregularity of the exhaust sound is deemed objectionable. Whatever weight this factor may possess applies equally to motor cycles, especially at low speeds, when the single goes "put-put-put," the twin "putput, putput, putput," and the four "b-r-r-r." As Mr. S. F. Edge used to say, the "silence" for which the motoring public clamour is in practice a *continuous* noise!

## Some Drawbacks.

There are, on the other hand, obvious drawbacks to the four-cylinder principle being adopted on two-wheelers, though some of them are of a temporary character, and are ascribable rather to the facts that the idea has never been worked out with enthusiasm by all our designers, and that not one rider in two hundred has personally tested its merits, than to inherent and irremediable defects.

(1.) *Difficulty of Cleaning.*—The engine outlines are complex, and the surfaces bristle with innumerable interstices, which cannot be kept clean. (Probably inseparable from air-cooling; but water-cooling is quite practicable, and, in conjunction with an encased magneto and carburetter, could afford a smoother surface than any existing motor cycle engine.)

(2.) *Greater Complexity.*—The motor cyclist is generally something of an ignoramus, mechanically speaking, and the multiplication of such parts as valves and sparking plugs will hamper him, besides causing more frequent stoppages. (This is to be contested. The bearings, valves, sparking plugs, etc., of four-cylinder light car engines give less trouble than the corresponding details of a single or twin-cylinder motor cycle engine, and are more durable; these light car engines have been rapidly evolved in response to a sudden demand; four-cylinder motor cycle engines might well evince a similar superiority. On the second point, the tracing of troubles is easier on a four-cylinder engine than on a twin, chiefly because the engine will always start and run on three cylinders, whereas a twin will not always start and run on one cylinder; or if it does, its running is so bad that the tester does not like to keep it working until he has solved the difficulty.)

(3.) *Greater Inaccessibility.*—This criticism is entirely untrue. There is no reason why the parts of a four-cylinder engine should not be quite as accessible as those of a two-cylinder.

(4.) *Awkwardness of Decarbonisation.*—This cuts both ways. The four-cylinder Henderson engine is mounted above a tubular platform brazed into the frame, and the engine can be slid bodily out sideways for decarbonisation far more easily than the ordinary big twin engine can be dropped out downwards. If sufficient care be taken in keeping the control rods of the gear, clutch, etc., out of the way, the four-cylinder engine should be detached with more ease than the twin, since its freedom from vibration permits it to be mounted less rigidly, therefore it need not be built so substantially into the machine. When dismantled, it is probably slightly the more difficult of the two types to decarbonise; but as it lends itself better to scientific lubrication and to water-cooling, its perfected forms should require less frequent decarbonisations than the twins.

(5.) *Ultra-long Wheelbase.*—The designer of a four-cylinder machine must choose between mounting his variable gear in the back hub, or elongating his wheelbase to a degree which spoils the machine for solo work. Hub gears are rapidly passing out of favour, but no practised rider likes the tremendous wheelbase which results if a gear box is accommodated inside a frame behind a four-cylinder engine. This defect is negligible when a sidecar is added, for the wheelbase of a sidecar outfit may be lengthened without any disadvantages.

I should advise designers who are interested in the future of the costly high-powered motor bicycle to make a very thoughtful trial of the four-cylinder F.N. or the Henderson.



### "Mechorns" for Sidecars.

I apologise for the above atrocity—please puzzle it out; I print it as a horrid warning against American abbreviations, and to introduce the advice of a sidecar owner who does a lot of his mileage in very heavy traffic. He has fitted his mechanical hooter to the sidecar tube, and sounds it with his foot, thus leaving both hands free for other duties. I wonder how many of the mechanical hooters on the market are strong enough to withstand the thrust of my No. 10 boot, especially when I am in a petulant mood (or "peevied," as the Americans would say). Anyhow, I personally conceived the same brilliant notion, but when I examined the slender shaft of the plunger of my own hooter, the angle of its stem, and the watch-like fragility of the mechanism inside the casing, I decided it had best remain hand-operated.

### A Tale without a Moral.

Second Lieutenant Buggins got thrown off his gee on a very, very 'ard, 'igh 'road. Moreover, the men laughed. Moreover, just as he had nearly cut out First Lieutenant Wuggins with the very pretty barmaid at the Fox and Hounds in the neighbouring town of Sloshton, Wuggins, in most unsportsmanlike and ungentlemanly fashion, refused to contribute to his own discomfiture by taking Buggins into Sloshton on his big "Met." six evenings a week. On the seventh evening, Buggins, being junior sub, was usually orderly officer. So Buggins hied him to town, and bought a motor bicycle, on which to beat all records into Sloshton, and (delirious dream) to joy-ride Miss Jenkins pillionwise. Buggins showed off his new purchase round the camp. One of the D.R.'s, requested to pick holes, remarked that the silencer extension would get some crumpled if "sir" had a left-hand side-slip. The next D.R. respectfully ventured the remark that the machine was as silent as a Rolls-Royce, at which Buggins swelled visibly, until the D.R. explained that, by reason of the aforesaid silence, "sir" would probably run over somebody before the week was out. Chief artificer is consequently ordered to remove the extension pipe. He does so. After mess Buggins starts for Sloshton, his engine emitting a veritable Brooklands crackle. *En route* Buggins overtakes the C.O. riding a blood mare. Blood mare objects to Buggins's crackle, and throws C.O.; C.O. conceives a prejudice against Buggins. Buggins is presently transferred to the third line, as result of said prejudice. First line goes to France, and is concerned in a bayonet charge against uncut wire and concealed machine guns. All officers of Buggins's company wiped out. Buggins is safe at Sloshton, wooing Miss Jenkins nightly, in absence of Wuggins on active service. Strange but true; Buggins's life was saved by a badly designed silencer extension pipe. This tale has no moral; it is merely a study in causation.

### Flooding Carburetters with Two-strokes.

Can anybody tell me why most new carburetters are delivered with leaky needle valves nowadays? As most of my recent purchases have been two-strokes, I was almost driven to the conclusion that testers adjust for a slight flood to get easy starting, relying on the engine suction to stop the overflow when the machine is hard at work. But the other day I took over a new four-stroke, and found the usual flooding in progress, so I began an overhaul. Both the tank taps were leaking; the drain tap was easily stopped by hammering the plug barrel into its socket, screwing the nut tightly up, and inserting a packing washer of light tin. The petrol feed pipe tap was incurable, as I wished to leave it in a rotatable condition, and no amount of grinding would render it petrol-tight. Luckily my box of bits contained a spare tap, which was soon substituted. Then I started on the carburetter. Luckily this had no bobweights, so that I could remove it from the machine and test the fit of the needle valve on the bench. It is always a delicate business to grind in a float needle. My own plan takes the form of making a tin lid for the float chamber, and drilling a central hole just wide enough for the tip of the needle to emerge; even this does not ensure absolutely central grinding. I suppose the trouble is that most of our best mechanics are on active service or engaged upon munitions.

### One of the Mighty Fallen.

The other day I ran across A. E. Catt, hero of a winter six days record ride, and found him gleefully bestraddling a two-speeded baby two-stroke. He had bought it in a fit of pique, consequent upon brief ownership of a Yankee single-cylinder. Forsaking British goods reluctantly, owing to war scarcities, he fell in with one of those hopeful but muddy-brained concessionaires, who expect to make money by supplying Englishmen with Yankee single-cylinders. I have a great respect for some Yankee twins I could name, but I gang very warily where Yankee singles are concerned. Your Yankee manufacturer does not really care a couple of splitpins for single cylinders; I am not quite sure why he makes them; they are of no service in a business which is wrapped up with speed records, and I can only suppose that even in America there are a few riders who can't afford the 7 h.p., and anyhow, he meditates, the British market is stupid enough to prefer singles on the whole. So he takes a circular saw, bisects his twin, and calls it a single, with the result that you have to take two days off if you want to decarbonise. It has never dawned on the average Detroitter's brain that, though you cannot easily make the cylinders of a 7-9 h.p. quickly detachable, it is a sinful 4 h.p. which needs its engine dismounting from the frame for a carbon scrape. After a dose of this sort A. E. Catt invested in a British two-stroke, and when I saw him he was off on a long business trip.



# A Variable Jet Senspray Carburetter.

How to Make and Use an Attachment which Varies the Jet from the Handle-bar.

**C**ARBURETTER experimenting, or tuning as it is popularly called, is always an interesting subject with motor cyclists, principally on account of the possible increase in economy or power, whichever may be the end in view, but also because no other part of the machine's equipment is so sensitive to slight variations, and the dividing line between improvement and deterioration is so finely marked.

That a Senspray carburetter is a powerful instrument will not be denied, but as it could not approach in the matter of economy and slow running one or two other makes previously tried, the writer was prompted to try what experimenting could do in this direction. The slow-running feature, of course, demanded a pilot jet, and the handy by-pass made by Badcock's settled this question after a few initial adjustments, but the petrol consumption remained practically unaffected. It was now possible to run at five miles per hour on top gear with passenger in the sidecar without any signs of snatching or irregular pulling on the part of the engine, and with the clutch out all signs of racing had disappeared. The consumption trouble was a harder nut to crack, and it took several hours' thought before a needle-controlled jet solved the difficulty. It was evident from consumption tests at various speeds that more petrol was wasted proportionately at low road speeds than at high speeds, but if a solution were attempted by the use of an exceedingly small jet, then at half throttle the engine would take practically no air, and its hill-climbing powers were reduced. In other words, economy was obtained at the sacrifice of power. From this it soon became evident the jet must be variable to suit the road conditions, and the rest of the time was spent in devising how it could be done.

Details have already appeared in this paper of a needle-controlled Senspray carburetter, but they lack the main essential feature, in that to be of any real service the normal position must be the position of maximum economy which demands the instant variation of the jet while driving to meet sudden emergencies, and any such adjustment must of necessity be controlled from the handle-bar. The actual fitting up of the various parts requires a certain amount of skill and care, but is not beyond the scope of a keen amateur able to use a few simple tools.

## How to make the Attachment.

The principal operation is drilling the holes in the carburetter and spray tube exactly opposite the centre line of the jet, and it is better to spend some time in rigging up an attachment or clamp for the part to be drilled and some support and guide for the drill, as any deviation from the true position will be detrimental, and might easily result in permanent damage to the carburetter.

In this hole is soldered a guide tube, consisting of a piece of brass tube about  $\frac{5}{16}$  in. outside diameter and of 18 gauge metal, carrying at the top a round brass nut tapped  $\frac{1}{4}$  in. Whitworth for the upper portion of its length, the lower portion having been drilled out to slip over the brass tube and sweated in place.

The sliding portion which works inside the tube consists of a short piece of  $\frac{3}{16}$  in. diameter brass rod having an ordinary fine sewing needle soldered into a hole in one end and the inner strands of the Bowden cable into a similar hole in the other end. Above the rod and threaded on the wire is a steel spring, the outside diameter of which must not exceed  $\frac{3}{16}$  in., and having sufficient strength to overcome the friction of the Bowden cable, and a brass regulating screw, the head being counter bored to act as a stop for the outer member of the cable, and a  $\frac{1}{16}$  in. hole drilled right through the screw for the inner member. The

threads must be turned or filed off the lower end of the screw to permit it to enter the guide tube a short distance below the level of the tapping. If any difficulty is experienced in threading the  $\frac{3}{16}$  in. rod through the quarter nut a drill slightly over  $\frac{3}{16}$  in. in diameter can be run down the nut which will cut away the sharp edges of the thread without materially affecting its hold on the screw.

The handle-bar control is made from a second piece of brass tube about

$\frac{1}{4}$  in. only outside diameter, and a length of screwed brass wire of the size known as 4 B.A. A clip for the tube is first made from sheet brass or copper and soldered in place, the end being drilled to fit under the hexagon set screw on the Senspray control. The tube has soldered on one end a brass block drilled right through for the Bowden inner wire and counter-bored for a short distance up as a stop for the outer covering. The screwed brass wire is drilled at one end to take the inner strands, and the other end fitted with a large milled nut for adjusting the lift of the needle and a smaller round nut which is afterwards soldered to the screw to form a head.

Before soldering the Bowden wire and small nut in position assemble the carburetter parts on the needle

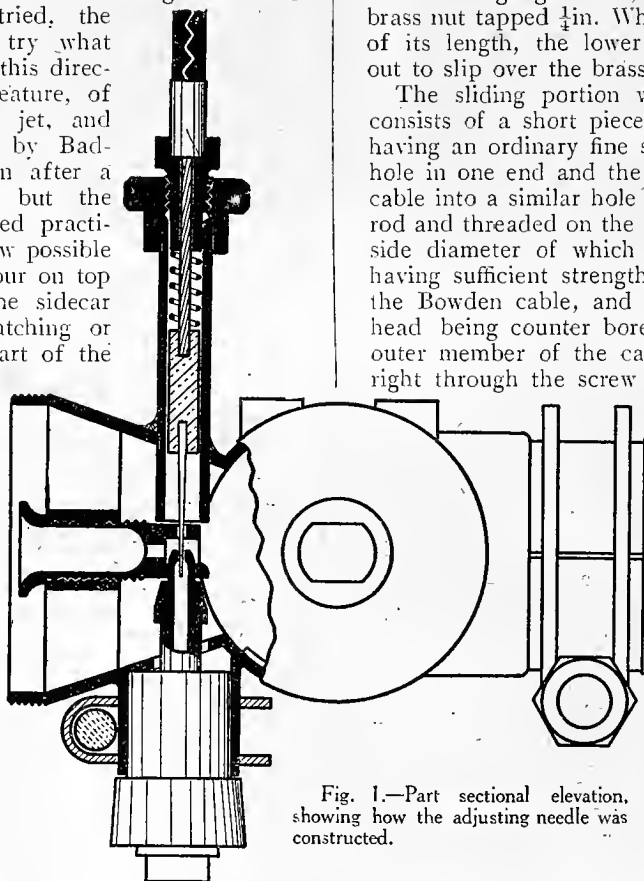


Fig. 1.—Part sectional elevation, showing how the adjusting needle was constructed.

**A Variable Jet Senspray Carburetter.—**

end of the Bowden inner strands in the order previously mentioned.

**The Method of Adjustment.**

To adjust the parts insert the needle into the carburetter guide tube and screw down the regulating screw as far as it will go, and by looking through the carburetter ascertain the position of the needle in the jet. The exact distance it descends into the jet depends on the size of the jet and the diameter and taper of the needle, but it should

not be so far down that the jet is completely stopped up; probably  $\frac{1}{2}$  in. from the top of the jet will be the maximum.

Still keeping the needle in this position, place the large milled nut on the handle-bar control and screw up until the needle is just on the point of lifting; then screw on the small round nut into contact with the milled nut, and solder the small nut only to the brass screw. Cut off any projecting screw and file smooth. It will now be evident the needle is at its lowest position when the two handle-bar nuts are in contact, and when

once the regulating screw on the carburetter has been correctly adjusted the distance between the two nuts represents the lift on the needle.

If an attempt be now made to start the engine it will probably be found to be impossible owing to the jet being too small, and if so, the screw must be raised slightly, a half-turn at a time, until the engine will just start easily with one-third throttle and air lever closed. It is better to find what is the lowest position at which the engine will run at eighteen to twenty miles per hour on the flat on top gear with about one-third throttle and about half air by adjustments with the regulating screw before any attempt is made at adjusting by the handle-bar nuts, as, once

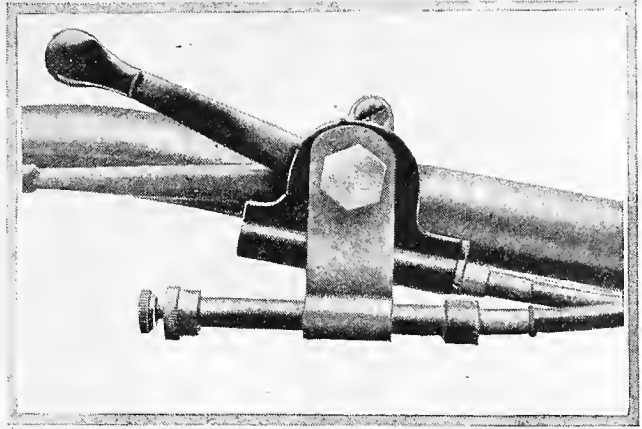


Fig. 4.—Method of attachment to handle-bar

found, this can be assumed as the permanent minimum jet setting, and can always be obtained after any temporary increase from the handle-bar by running the two nuts on the handle-bar tube into contact again.

**The Device in Use on the Road.**

When on the road if undulating country is encountered the needle is raised by turning the large milled nut (the Bowden wire will resist the tendency of the screw to turn if the nut is easy on the threads), the needle remaining in the new position until again altered by turning the nut. If a sudden increase of power is required, as frequently happens in traffic or when starting in cold weather, open the jet by pulling the milled nut away from the tube and holding as long as the increased effort is required. Letting go the nut will allow the needle to return to its normal position by the action of the spring.

This variable jet attachment thus gives a minimum size of jet for light loads and favourable conditions, an infinitely adjustable increase up to the maximum size of the jet, and the possibility of suddenly obtaining this full jet opening without touching the throttle or air levers in cases of emergency.

With regard to economical running, a test was recently made in the following way. The petrol tap was turned on to allow the float chamber to fill to its normal level, and then turned off and the tank emptied. A quantity of petrol, measuring exactly sixty-four fluid ounces, was poured into the tank, the engine started, and, with a passenger aboard, a start was made over an undulating course of thirty miles. The full jet was necessitated on three or four rises to keep in top gear, and one short hill was encountered which demanded a drop to second, but, in spite of this on arriving home, and after making sure the float chamber was again filled to the same level as before, twenty ounces of petrol were measured out of the tank, making the consumption for the thirty miles just forty-four ounces. This works out at slightly in excess of 109 miles per gallon, the previous best with the carburetter as purchased being at the rate of eighty-five miles per gallon, thus showing an increase of twenty-four miles per gallon, which is an appreciable saving.

The size of jet used was a No. 38, and ordinary No. 2 Pratt's petrol provided the power.

FRANCIS E. SCHOFIELD.

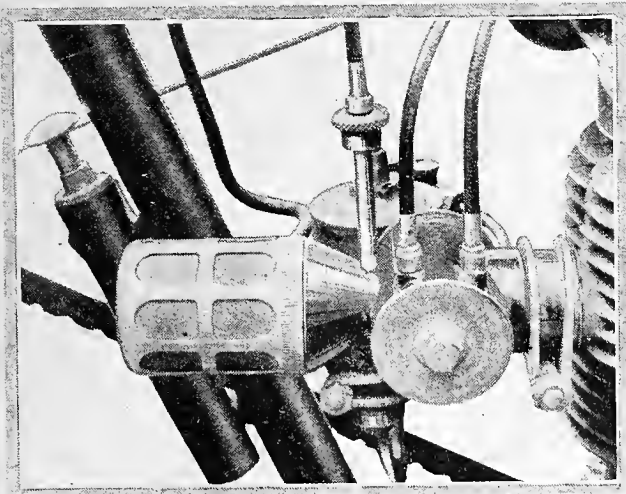


Fig. 3.—The carburetter in position on a  $3\frac{1}{2}$  h.p. Triumph.

## THROUGH FEMININE GOGGLES.

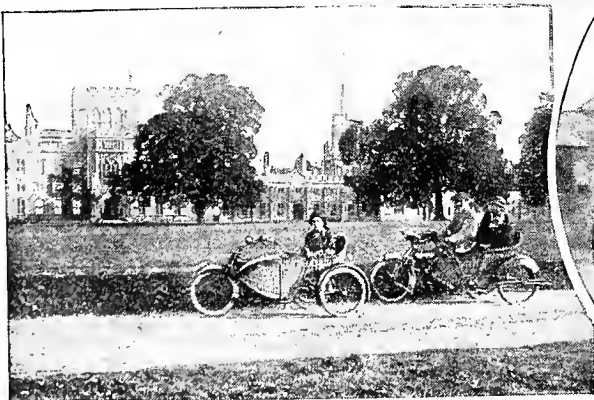
A Motor Cyclist's Autumn Ramble in North-west Hertfordshire.

**T**O the motor cyclists who have yet to experience the charm of Ashridge, the following may be of interest. Ashridge is the country house and estate of Earl Brownlow, and the wooded park covers an area of eleven miles. The distance from town can be easily covered in a couple of hours *via* Watford and Berkhamstead or Tring. The Ashridge roads are admirably kept, and the old pensioners of the estate are set apart to attend the highways after passing the hey-day of their lives. One can drive for a number of miles with trees that meet overhead with fern and bracken on either side. The house, a noble old pile, looking like a great cathedral, at one time was a royal palace. Connected with the house is an old sixteenth century courtyard still containing the implements of an old-time tilting ring. The several coach-houses have still their old-fashioned studded doors, but now contain up-to-date cars. The house, together with the lovely rhododendron valley, is only on view on special occasions. Taking the turn to the right past the house brings one to a lodge gate. At the sound of the engine the lodge-keeper hurries from his cottage to open the gate. Following the road brings one to a half-mile of grassy sward; here situated in the midst of a circle of trees is the monument erected to the memory of Francis, 3rd Duke of Bridgewater, father of English canals. This can be ascended by means of a spiral staircase, and many energetic motor cyclists make the climb.

### Aldbury Stocks.

Near the site of the monument is a narrow chalk cutting which leads to the quaint old village of Aldbury, with its historic stocks in the centre of the village by the pond. Green, worm-eaten and rotten they stand as a link with the past and its bygone customs. Unless one has particularly good brakes, the aforementioned way to the stocks had better be abandoned for the more general route. This gradient attacked from Aldbury would constitute something of a freak hill. On the roadway between Ashridge and Aldbury is the most perfect archway of trees that is to be found in this part of the country. On a summer or autumn day, with the sun shining through the trees, the place is perfect. Rabbits scuttle across the track in their dozens to take refuge from invaders, and occasionally a startled deer will gallop across the greensward and become lost to sight amid the wild fern. The "Bridgewater Arms" is an hotel on the edge of the park which caters for the material needs of the motor cyclist, and was a favourite rendezvous of the M.C.C.; and if, when next wondering "where to" for a country spin, the driver heads his machine for North-west Herts, he will be most difficult to please if he is not amply satisfied with the profusion of nature's bounties.

MAY WALKER.



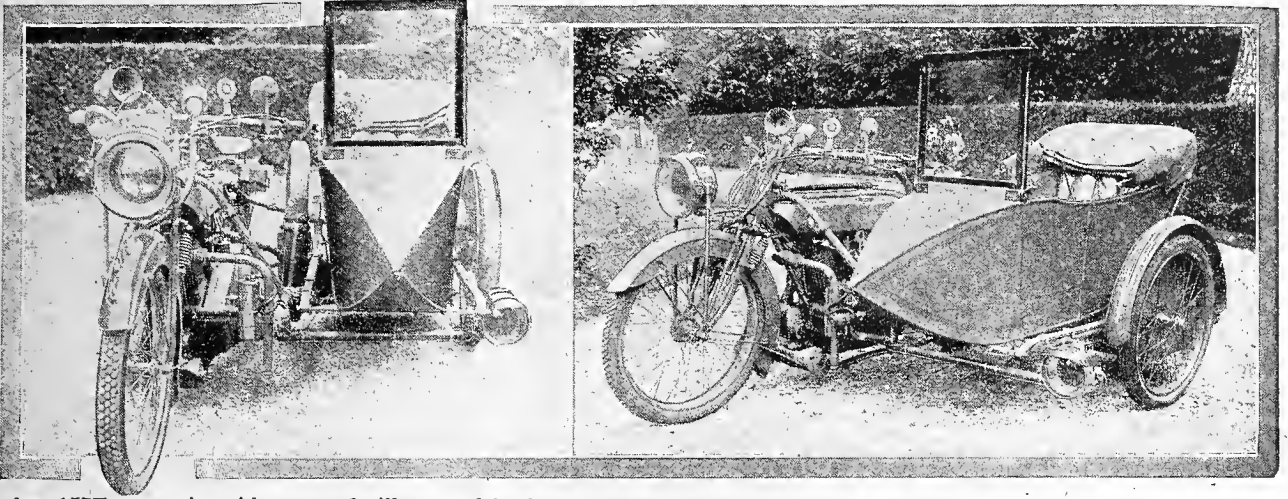
(Top) The monument in Ashridge Park.

(Left) Ashridge House, near Tring.

(Right) The Bridgewater Arms, absolutely on the edge of the park, and a popular week-end rendezvous for motor cyclists.

# A HANDSOME SIDECAR OUTFIT.

A Dutch Motor Cyclist's Passenger Mount.

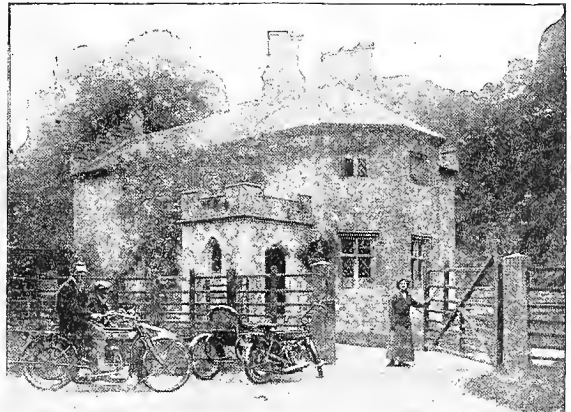
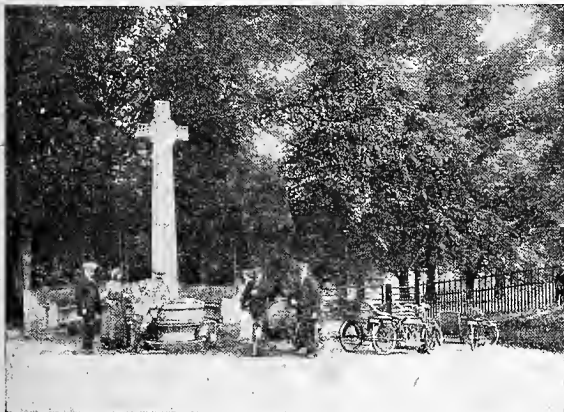


THE attractive sidecar outfit illustrated is the property of Mr. Robert toe Laer, of Amsterdam, who is well known to many of our readers in connection with the Anglo-Dutch Trial. Mr. toe Laer was recently appointed secretary of the Motoring Committee of the Dutch Touring Club. The machine is a Simplex, fitted with a twin-cylinder V engine rated at 9-12 h.p. (988 c.c.) It has side-by-side valves, and the tappets are protected against mud by means of special shields. Gas is supplied by a Brown and Barlow carburetter. The countershaft gear box provides four speeds, the clutch is controlled by hand, and combined belt and chain drive is employed. The lubrication is by Best and Lloyd semi-automatic drip feed, and also by pressure feed direct to the engine. The spring forks are of the heavy Druid type, and the large motor car head light, it will be noticed, is supported by means of a special bracket. The sidecar, which is Mr. toe Laer's own design, is attached to the machine at five points. The body is carried on special heavy springs, and a Truffault type of shock absorber is provided. An adjustable windscreen and

Cape cart hood and hood cover will be noticed in the illustration.

The sidecar is particularly well equipped, and has provision for spare oil and petrol and a spare tyre, while there is a large luggage carrier at the rear. Both electric and dissolved acetylene lamps are fitted. The whole is enamelled in blue-grey with blue lines, and there is very little nickel plating about the machine. Though built in Holland, most of the fittings are English. In addition to those mentioned, there are a Watford speedometer, a handle-bar mirror, not forgetting the A.C.U. badge on the handle-bar.

A doctor with H.M. High Seas Fleet writes in the course of a letter to us: "If anybody thinks motor cycling a pastime for the young knuts only, he should watch a certain gallant rear-admiral taking corners at 30 m.p.h. on an old Triumph, and that after sixteen months of war! Five of us on board this battleship regularly read your paper, but we do not get much chance of doing any sprinting!"



A MOTOR CYCLIST'S AUTUMN RAMBLE IN NORTH-WEST HERTFORDSHIRE. (See previous page.)  
Two entrances to Ashridge Park. The semi-circular stone seat behind the monument in the left-hand picture should be noted.



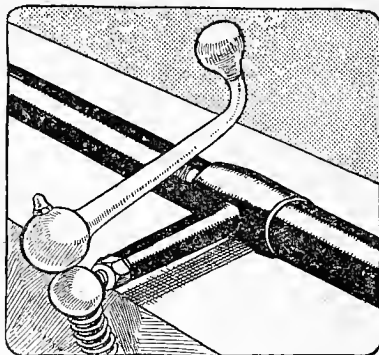
## A NEW MODEL DIAMOND.

2½ h.p. J.A.P. Engine, Newly-designed Frame, and Enfield Two-speed Gear.

**A**NYTHING which emanates from the Diamond factory is generally of exceptional interest, because this machine is one of the few where the designer betrays great ingenuity, especially as regards the minor details. Although the new model really is an assembled machine, nevertheless there is scope for much good design in the frame and fittings.

The standard J.A.P. engine unit with a bore of 70 mm. and a stroke of 76 mm. (292 c.c.) is used. This has the magneto supported upon an aluminium platform at the back and driven through a train of spur wheels within the usual curved aluminium cover. Owing to the position of the magneto, a very long straight inlet pipe is necessary, and the Amac carburettor is secured to this pipe.

On the left-hand side is a chain drive, enclosed in a very rigid metal case, and connecting the engine to the Enfield two-speed gear, which latter drives the belt pulley on the right-hand side of the machine through a shaft housed within the enlarged bottom bracket. Adjustment for the chain is obtained by the usual Enfield method of mounting the countershaft in eccentrics, which can be turned to bring the shaft further away from or nearer to the engine, and



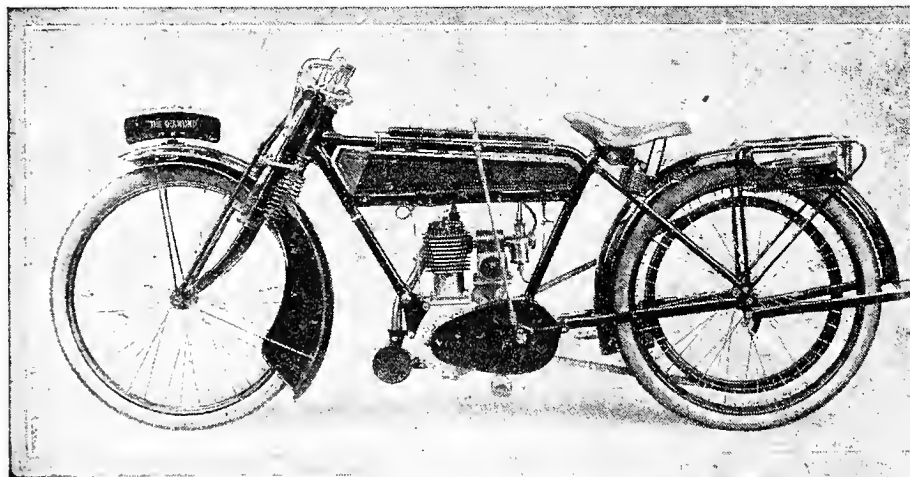
The Enfield gear control and its special bracket on the top tube of the new Diamond described on this page

with its extremely pleasing lines, and the photograph shows that the tank in the top tube slopes in the manner associated with the Diamond, the tube below the tank being parallel to the ground and joining the seat pillar at a point some little distance below the saddle. The tank is finished in the usual Diamond green, and holds 1½ gallons of

petrol and one quart of lubricating oil, the two compartments being divided off by two separate walls, so that there is an air space between the oil and petrol, and leakage from one tank will not affect the other. The seam of the tank is in a somewhat unusual place, being at one of the lower edges, at which point the metal is bent over into a peculiar dovetail joint and then soldered. An advantage of this method of construction is that it allows of the various tank fittings being soldered in position before the tank is closed up.

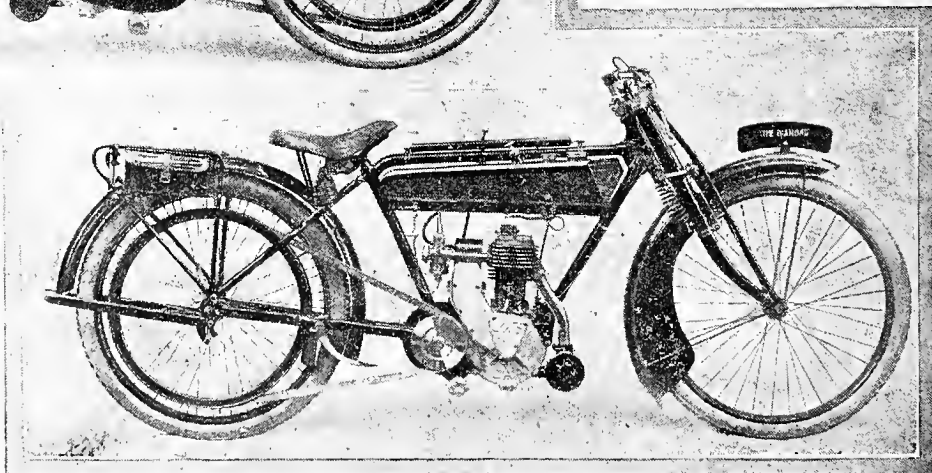
### Frame Design.

It is here, as regards the construction of the frame, that the ingenuity of the designer has had full play. Not only is the head long enough to give adequate supporting distance between two thrust bearings, but the lugs into which the top tube and down tube are brazed have exceptionally strong webs, the tubes themselves being carried right through the lug before the brazing is performed. The bottom bracket is most interesting of all. The bracket itself serves a number of purposes. First of all comes the large housing for the countershafts of the Enfield gear; also there are extensions formed solid with this bracket in order to secure the engine, there being two arms at either side which are drilled to correspond with two of the lugs running across the engine crank case. This makes a rigid job of the engine support, and also gives the factory a chance to drill these pieces more accurately and more cheaply. Beneath the bottom bracket is formed a face which is machined and then fitted with three studs for the purpose of holding a special malleable bracket curving forward as seen in the second sketch. This bracket supports a strong steel tube whereon are the footrest



locked when in the correct position by a large ring. The control rod for the gear slopes upwards, and is attached to the frame by a special bracket. It is probable that the bracket will be placed slightly further forward on the frame in the future, as at present it is rather in the way of any rider having an exceptional length of limb. The drive from the pulley to the rear wheel is taken by a 3in. Avon belt, and the belt rim is drilled both to prevent dirt accumulating within the rim and to take away unnecessary weight.

Looking at the machine for the first time, one is struck



New Diamond single-cylinder four-stroke model. The engine is a 70 mm. × 76 mm. J.A.P. The dropped handle-bars will be noted.



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IT is worth while to wait when you know it is waiting for a good thing.

Will you wait while we fill the urgent needs of the country—while we help, as far as it is in our power, the men bearing the heat of the fray?

To every Patriotic Britisher the country's needs come first. Will you surrender your personal requirements in this hour of stress while we throw our immense manufacturing resources into the scales, and wait for the day of peace which every moment draws nearer?

## TRIUMPH CYCLE CO., LTD., COVENTRY.

London - - 218, Great Portland Street, W.

The word "TRIUMPH" is written in a bold, serif, all-caps font. The letters are thick and closely spaced. A thick, dark, curved line arches underneath the letters, starting from the left side of the 'T' and ending at the right side of the 'H', creating a sense of motion or a banner.

# TAN LEATHER M.C. COSTUME



Best Quality Tan Chrome Skins, lined camel fleece

**A magnificent costume  
for Winter Riding.**

The coat is double-breasted and cut on smart lines. The Trouser Overalls are also lined camel fleece, and have a strap at the ankle

Price of Coat, £2 17 9

Price of Overalls, £2 6 6

Overalls (lined tweed) £1 15 9

## Dunhills Ltd.,

359-361, Euston Road, LONDON, N.W.  
2, Conduit St., W. 42, Lombard St., E.C.

Manchester: 90-92, Cross St.

Glasgow: 72, St. Vincent St.

THE



BEST

Reliability  
OF THE

## RICH

### DETACHABLE Tubes & Covers

4,500 miles on a RICH Tube without using the pump. This absolutely unsolicited testimonial can be seen with a thousand others, at our office; also hundreds of ends of all other makes — British and Foreign — with the opinion of the riders.

ON

EARTH

GUARANTEED AIR-TIGHT, with Free Air Passage.

PRICES:

	24in. or 26in.	28in.
1 1/2 in. ....	8/-	9/-
2 in. ....	11/-	12/-
2 1/2 in. ....	12/-	13/6
3 in. ....	13/-	14/6
2 1/2 in., 650 x 65	14/6	16/6
3 in. ....	20/-	23/-
3 1/2 in. ....	26/-	30/-

PEDAL CYCLE, 26 or 28in., 1 1/2, 1 3/4, 1 1/2, 6/6.

Not sold under the above prices.

Cyclists' own tubes fitted with Detachable Joint. 1 1/2, 2/3, 2, 5/6, 2 1/2, 5/6, 2 3/4, 6/6, 3, 7/6, 3 1/2 in. 8/6. Pedal Cycle, 1/6. Always send size of Cover.

Write for Booklet.

The Thames Rubber & Leather Co.  
199, Upr. Thames St., London, E.C.

Testimonial.

Gentlemen, Highgate. Please send me a Rich Tube. I must mention the one I tried and have in use since 1911 is still acting splendidly, and I am now transferring the present one to the front and fitting a new one to the back. They are a boon.

## THE THREAD

used on

THE

# LODGE

## PLUG

is in exact accordance with the dimensions agreed upon and authorised by the Engineering Standards Committee.

The thread on the Lodge Plugs has always been cut to those dimensions.

No increase in price.

**4/**

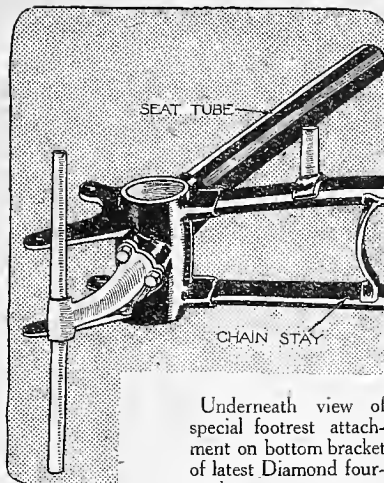
Same as before the war.  
Stocked at all Dealers.

The Lodge Sparking Plug Co., Ltd.,  
Birmingham and Rugby



**A New Model Diamond.—**

pads. Most riders will appreciate this construction, because, sooner or later, a machine is bound to have a fall, which bends or permanently distorts the footrests. If the footrest tube is brazed up solid with the frame, not only does the machine become unsightly, but it may happen that the repair of the footrests may involve expensive alterations to the frame. In this particular instance the footrest tubes bend first, and if the damage is not great it can easily be rectified, but in case of exceptional damage the footrest, together with its bracket, can be removed entirely and a new one substituted. On the chain stays there is a special bracket brazed to each stay and drilled to receive the small screws which hold the bottom part of the mudguard, while in the right-hand chain stay is incorporated an aluminium casting containing the lug for the special Diamond foot brake. This brake is most simple, and acts within the groove of the rear wheel pulley, and from the fibre-shod operating arm a spindle is carried through a lug in the chain stay and attached to a long pedal to be operated by the rider's heel, which is simple and provides a good brake.



Underneath view of special footrest attachment on bottom bracket of latest Diamond four-stroke.

Another alteration for 1916 is in the carrier, the side supporting tubes of which form a triangle with rounded "angles," thus making the construction stronger to withstand the exceedingly

rough usage which this part of the machine invariably undergoes. The front wheel is held by a Druid fork of exceptional width, in order to allow of a wide mudguard without cutting into the guard at that point where the forks are placed. Stronger spokes are now used, and special dust-excluding caps protect the bearings at each end of the hub, the same construction being applied to the rear wheel. A somewhat unusual form of T.T. handle-bar is employed, being practically a straight tube from the head to the handle-bar grips. This form of handle is experimental, and was used on one of the Diamond racing machines. It appears to give a comfortable riding position with an extraordinary sense of control.

Studded Avon tyres (26in. x 2in.) are fitted, and the machine weighs about 120 lb. The following measurements may be of interest. The wheelbase is 53in., and the ground clearance beneath the silencer, which is the lowest point, is 5in. From the saddle to the ground, with the machine off its stand, is 28½in.; and as regards the Enfield gear the top speed is 6 to 1 and the low speed 10.5 to 1, ratios which have been found extremely satisfactory.

## A Visit to the Sunbeam Works.

**D**URING a visit to the works of John Marston, Ltd., of Wolverhampton, we were able to inspect a number of Sunbeam motor cycles in the different stages of manufacture, and every facility was courteously afforded us to examine the different parts as they emerged from the different processes. Throughout, the impression conveyed to us was one of first-rate material, exquisite finish, and a care in matters of detail, which attributes in themselves explain the popularity and success of the world-renowned Sunbeam. The Sunbeam Co., like many other leading firms in the motor cycle trade, are constantly being dazzled with large orders for their products, which they are unable to accept, for the reason that a good proportion of the works is busily occupied in the manufacture of sundry munitions of war, and, apart from that, a fair percentage of the output of motor

bicycles has been regularly absorbed by the Russian Government.

During our tour of the works we were particularly interested in the new 8 h.p. twin-cylinder model, and noted the fact that these engines are entirely stripped for inspection and assembled again with Sunbeam care and precision before being built into the frame.

The 8 h.p. engine is really the only change of note in the passenger model, other details remaining in general the same as on the 1915 pattern Sunbeam passenger outfit. The gear box, for instance, is interchangeable. The lubrication of the gears is now effected by a pipe from the two-way lead on the hand pump.

The 8 h.p. Sunbeam is very fast on the road, and is, moreover, quiet and controllable at all speeds. We are told that 55 m.p.h. is quite possible, and T. C. de la Hay, whose name is well-known in

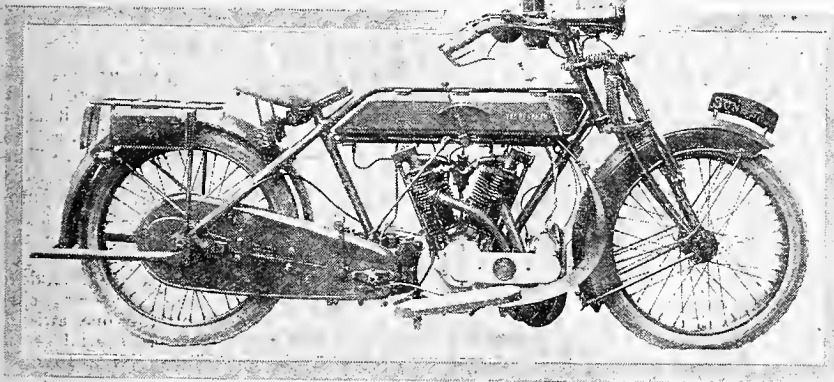
competition circles, told us of a trip he had from London to Wolverhampton which occupied so short a time that we refrain from publishing it.

The lubrication of the 8 h.p. twin is effected direct to the back of the front cylinder, there being no oil entrance to the crank case whatever. The oil is fed from the ordinary sight-feed drip lubricator to a cover plate attached to the cylinder, a ball valve being enclosed in this plate. The pistons have oil grooves formed in the full depth of the skirt. As is well known the front cylinder of a V twin presents some difficulty in the matter of lubrication, and thus, by arranging that all the oil for the engine enters by the front cylinder, adequate lubrication for the whole of the parts is ensured.

The Sunbeam is not cheap, but no one would expect it to be after an examination of the finish, which is above reproach. Complete with a first-class sidecar outfit and every refinement of which the most enthusiastic sidecarist has ever dreamt, the price can be made to come out at very little short of £150.

### BRITISH BOSCH MAGNETOS.

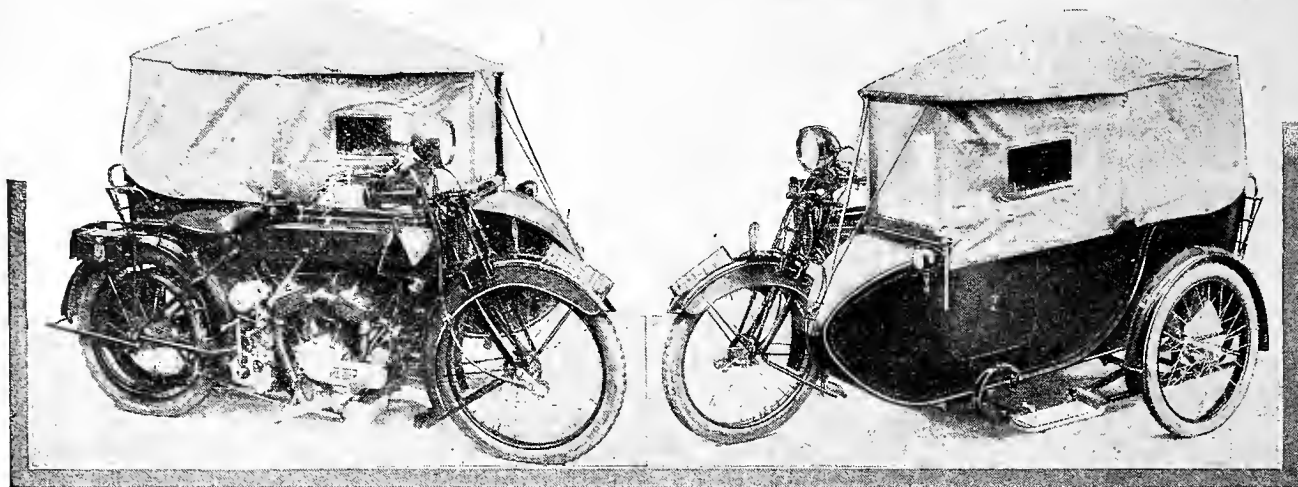
**W**E recently made an interesting tour round the Bosch works in company with Mr. A. E. Bennett of the Bosch Magneto Co. Here we saw British-made Bosch magnetos in all stages of manufacture, and various examples of the excellent workmanship of which the London works are capable. At the present time very few motor cycle magnetos are being turned out, as practically the whole of the energies of the company are being devoted to the manufacture of these instruments for aeroplanes and other military purposes.



The 8 h.p. twin-cylinder Sunbeam, which replaces the 6 h.p. model of the make of 1915. It is essentially a sidecar machine de luxe.

## A Weatherproof Family Sidecar.

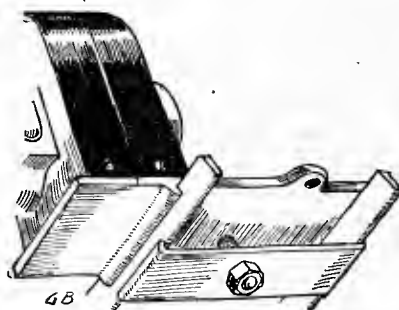
A Most Luxurious Millford Sidecar attached to the Latest 8 h.p. Excelsior Twin.



### THE HEIGHT OF SIDECAR LUXURY.

A 1916 model 8 h.p. twin-cylinder British Excelsior, to which is attached a Millford tandem-seated sidecar capable of being completely enclosed. The outfit is equipped in a lavish manner.

**W**E recently had the opportunity of inspecting the latest production of the Excelsior works, viz., a most luxuriously fitted up big twin sidecar outfit. It was built to Mr. Carson's special specification, and is certainly the last word in family sidecars. The machine is a standard 1916 Excelsior twin fitted with the latest 8 h.p. J.A.P. engine,  $85\frac{1}{2} \times 85$  mm., giving a capacity of 976 c.c. A Sturmey-Archer three-speed gear is used in conjunction with chain and belt transmission. A very neat little special fitting on the gear box is a simple device to facilitate the easy and accurate adjustment of the engine chain. It consists of a plate fitting over the four holding down bolts, attached to the rear end of which is a bolt that passes through a loop projecting from the frame, so that by slackening the four clamping bolts and tightening or slackening the nut on the adjuster bolt the exact position of



Arrangement for sliding magneto to take up slackness in chain.

the gear box, and so the tension of the chain, can readily be adjusted. Another fitting to render adjustment easy is the device fitted to the magneto platform. The magneto is attached to a separate

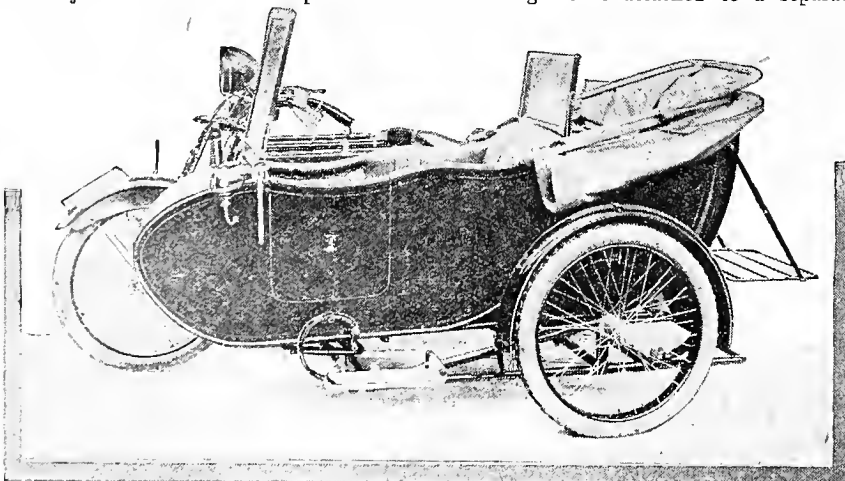
plate which slides on the crank case magneto platform on rails, the whole being held in place by a single large bolt and nut.

The wheels, which are  $650 \times 65$  mm., are very strongly built for heavy sidecar work, having large waterproof hubs and ten-gauge spokes all round. The mud-guarding is most excellently carried out, all guards having deep side valances, while to facilitate the repair of the back tyre the rear portion of the guard complete with the carrier is detachable by simply removing three wing nuts.

Stands are fitted for both wheels. The belt rim brake, operated by a pedal situated in a most convenient position on the right-hand footboard, is fitted in such a way that no matter how it is adjusted the pad presses evenly along its whole surface. The latest Brampton spring forks are fitted, which give an upward as well as a backward movement. Largo Brooks saddle, metal-covered tool bags, upturned aluminium footboards, and the parts which are usually bright finished in black complete the specification of the standard machine.

### The Lighting Outfit.

On the special machine we are describing a Lucas dynamo lighting outfit is installed. The dynamo is situated behind the engine, and is clamped to the saddle tube of the machine. The extraordinarily neat and practical switch box, also containing the fuse and automatic regulator and cut-out, is fitted just in front of the saddle, while the batteries are placed under the seat of the sidecar. Three lamps are included, viz., head, tail, and sidecar side lamp, all controlled by the one switch. The head lamp has a special bulb with two filaments, one giving 10 c.p., the other only 3 c.p., controlled by a switch fitted in the back of the lamp. There is also a small lamp in the hood of the sidecar, controlled by a



The new tandem-seated Excelsior-Millford sidecar outfit.

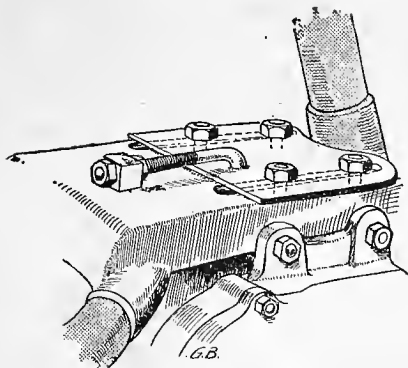
**A Waterproof Family Sidecar.—**

separate switch, and a powerful electric horn completed the outfit.

**The Millford Sidecar.**

This is one of the most luxuriously equipped sidecars we have seen. The chassis is specially strong, being made on what is known as the cantilever principle; the ordinary chassis is strengthened by a triangulated under-frame. Four-point attachment is used, the main front fixing being taken from the centre of the chassis.

The body is a two-seater, the rear seat being only intended for a child, but both are beautifully upholstered and ample leg room allowed. The whole is sprung on C springs both back and front. Each seat is provided with a separate adjustable windscreen, while under the box-spring cushions of both seats are large lockers for spares, etc.

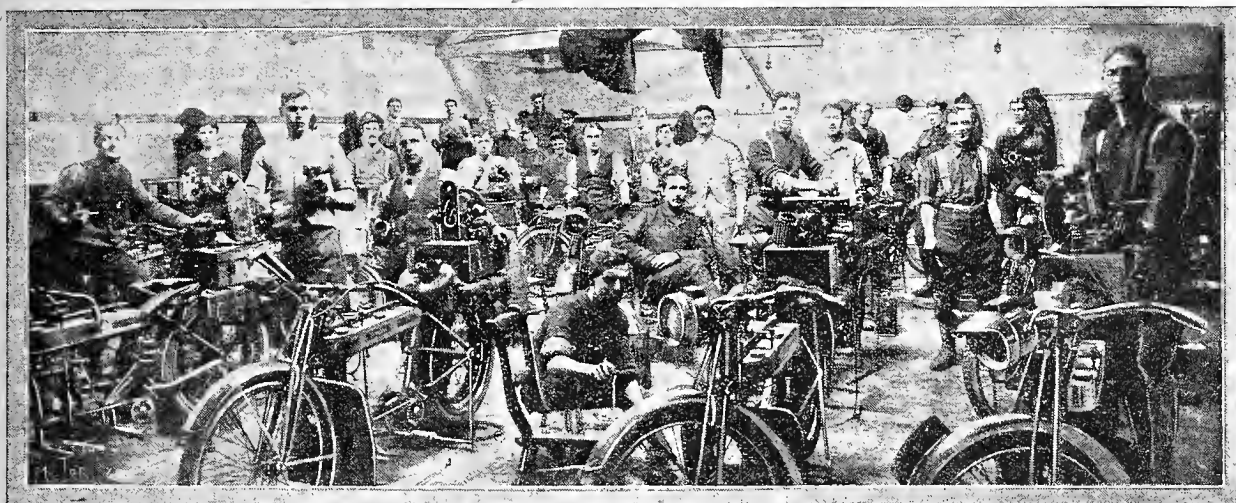


Method of adjusting position of gear box on 8-h.p. Excelsior.

A hood with side curtains, by means of which the whole sidecar may be entirely enclosed, is fitted, and when not in use is covered by a macintosh cover which can also be made to cover up the rear seat when not required. A foot warmer heated by the exhaust gases, placed in the floor of the front compartment, can be regulated by means of a butterfly throttle. The connection to the silencer is by a flexible metallic pipe. The luggage carrier is attached to the body instead of the chassis, so gaining the benefit of the springing. The finish of the outfit is very fine indeed.

The other Excelsior models are so well known that they hardly need mention.

The two-speed gear used on the two-stroke lightweight is now manufactured in the Excelsior works. This machine, with its chain drive, although not intended to be cheap, is a most workmanlike job.



ANOTHER MILITARY MOTOR CYCLE REPAIR SHOP. Artificers and R.E. despatch riders overhauling their Douglasses prior to their departure on active service. The photograph was taken at a training centre

**MILITARY MOTOR CYCLISTS AT SALONIKA.**

DESPATCH Rider P. J. Cox, a prominent competitor in Irish trials before the outbreak of war, provides, in a letter published in our contemporary, *The Irish Cyclist and Motor Cyclist*, some interesting information concerning present-day life around Salonika. The roads apparently are in an appalling condition, and the mudguards of the W.D. Douglasses quickly get clogged up.

The French despatch riders are not so fortunate in their mounts as their British allies, those in camp at Salonika riding ancient-looking Clements and Peugeot fitted with fixed engines and single gears.

The population do not altogether like the motor cyclists, the arrival of the latter disturbing their peaceful existence. They are accustomed to wander about the streets, and a silencerless Douglas on low gear is rather disconcerting to them.



Lance-Corporal Allen S. Jones, who has spent seven weeks in hospital after twelve months' service in France.

**ANOTHER WAR ZONE BUILT MACHINE.**

LANCE-CPL. ALLEN S. JONES, M.T.A.S.C., while working at a motor cycle repair base in France, put together a Douglas machine from parts of "scrapped" ones. He used it for his work and it proved very successful.

Jones, who is the well-known Welsh motor cyclist, has had an unfortunate time, having been in hospital for seven weeks with an injured hand. He started active service in the early days of the war as a car driver in the M.T.A.S.C. In March he was given a good post in a motor cycle repair depot, where he stayed until sent home with a bad hand. We are glad to know that he is now well on the road to recovery.

Mr. Jack Burnside, formerly of the Quadrant Motor Company, was, we regret to hear, killed in action on the night of December 30th.

**SIDECARS AND ACCESSORIES.**

The issue of "The Motor Cycle" for January 27th will deal mainly with sidecar attachments and accessories of all kinds.





## SPECIAL FEATURE

TWO HANDSOME SIDECAR OUTFITS.

FOUR-CYLINDER MOTOR CYCLES.

THE YEAR'S IMPORTS AND EXPORTS.

## TIME TO LIGHT LAMPS

GREENWICH TIME.

Jan. 13th	...	4.43 p.m.
" 15th	...	4.46 "
" 17th	...	4.49 "
" 19th	...	4.52 "

## No Green Lights.

A motor cyclist has been fined 40s. at the Mansion House for carrying on his mount a green light which, according to the evidence, was visible at a distance of 500 yards.

## Joining the Automobile Association.

The Executive Committee of the A.A. has arranged a concession with regard to the subscriptions of new members. All new members joining the Association now will be admitted to full membership until April 30th, 1917, at the following rates:

Car owners	...	£2 12 6
Light car owners	...	1 6 6
Cycle car owners and motor cyclists	...	13 6

Plus badge fees of 5s. for car, 4s. for light car, and 3s. for cycle car and motor cycle badges.

## From Northants to Cornwall.

Mr. B. H. Davies (who in the early days did so much for the motor cycle movement) desires to inform his correspondents and friends that his address is now St. Wenn, Bodmin, Cornwall. Motor cyclists calling upon him should follow the Truro Road to just beyond the sixth milestone west of Bodmin, just before the road crosses Goss Moor, where there is a brown stone direction post at a right-hand turning bearing the word "Withiel." His house is two and a half miles up this turning.

## Few Awards in Winter Trial.

The severity of the weather conditions experienced in the winter trial of the Dublin and District Motor Cycle Club in the Wicklow Mountains, a report of which appeared in our issue of the 30th ult., resulted in very few awards being won. Only two of the finishers qualified were won by P. H. Hurse (4½ h.p. offered. The first prize and Binks Cup was won by P. H. Hurse (4½ h.p. B.S.A.), who was the only competitor to score the maximum number of marks, and a silver medal was won by C. B. Franklin (7 h.p. Indian sc.) with 98 marks, a petrol failure in going downhill in a non-stop section causing him to lose two marks.

## A Lighting Disc Tip.

That seasoned rider, R. O. Clark, of Norwich, has evolved an excellent dimming disc that is quickly detachable. It is explained and illustrated in our correspondence pages this week.

## Average Prices.

We give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted. If there were not at least two advertisements, then the last occasion on which they were quoted is given.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S.	1915	6 3-sp. sidecar	£90	—
"	1914	6 3-sp. sidecar	£65	—
"	1913	6 3-sp. sidecar	—	£57
"	1915	2½ 2-speed	—	£51
Allon	1915	2½ 2-speed	—	£36
Ariel	1914	3½ 3-sp. sidecar	—	£53
Bradbury	1914	4 3-sp. sidecar	—	£47
B.S.A.	1915	4½ 3-sp. sidecar	—	£70
"	1914	4½ 3-sp. sidecar	—	£56
"	1913	3½ 2-sp. sidecar	—	£44
"	1913	3½ 2-speed	—	£31
Calthorpe	1914	2 2-speed	—	£17
"	1915	2½ 2-speed	£30	—
Clyno	1914	6 3-sp. sidecar	—	£63
"	1913	6 3-sp. sidecar	—	£50
Douglas	1914	2½ 2-sp. kick start	—	£38
"	1914	2½ 2-speed T.T.	£36	—
"	1913	2½ 2-speed T.T.	—	£32
Enfield	1915	6 2-sp. sidecar	£75	—
"	1914	6 2-sp. sidecar	£61	—
"	1913	6 2-sp. sidecar	—	£49
"	1915	2 2-speed	—	£48
"	1914	3 2-speed	—	£37
A. Excelsior	1914	7 2-sp. sidecar	—	£48
H. Davidson	1915	7 3-sp. sidecar	£66	—
Indian	1915	7 3-sp. sidecar	—	£74
"	1914	7 2-sp. sidecar	£56	—
"	1914	7 T.T. free eng.	—	£44
James	1915	4½ 3-sp. sidecar	—	£75
Lea-Francis	1915	3½ 3-speed	—	£63
Levis	1915	2½ "Popular"	£25	—
Matchless	1914	8 2-sp. sidecar	—	£70
"	1913	8 2-sp. sidecar	£53	—
New Hudson	1915	2½ 2-speed	£30	—
New Imperial	1915	2½ 2-speed	£30	—
"	1914	2½ 2-speed	—	£26
O.K.	1915	2 2-speed	—	£23
"	1914	2 2-speed	—	£23
P. & M.	1913	3½ 2-sp. sidecar	—	£43
Premier	1914	3½ 3-sp. sidecar	—	£49
"	1913	3½ 3-sp. sidecar	£40	—
Rex	1914	6 2-sp. sidecar	—	£48
Rover	1915	3½ 3-sp. sidecar	—	£56
"	1914	3½ 3-sp. sidecar	—	£41
"	1913	3½ 3-sp. sidecar	—	£40
Rudge	1915	3½ Multi	—	£47
"	1914	3½ Multi	—	£37
"	1913	3½ Multi	—	£29
"	1914	3½ Multi sidecar	£47	—
Scott	1914	3½ 2-sp. sidecar	—	£51
"	1913	3½ 2-sp. sidecar	—	£48
Singer	1913	3½ free engine	—	£23
Sunbeam	1915	6 3-sp. sidecar	—	£96
"	1914	6 3-sp. sidecar	—	£80
"	1915	3½ 3-speed	—	£63
"	1914	3½ 3-speed	—	£52
Triumph	1914	4 3-sp. sidecar	£53	—
"	1914	4 3-speed	—	£47
"	1913	3½ 3-sp. sidecar	£46	—
"	1913	3½ 3-speed	—	£38
Williamson	1914	8 2-sp. sidecar	—	£62
"	1913	8 2-sp. sidecar	—	£55
Zenith	1914	6 Gradua sidecar	—	£56
"	1914	8 Gradua sidecar	—	£67



## THE LAST STRAW!

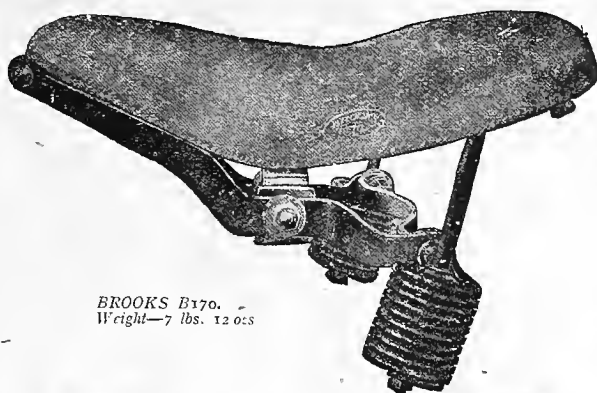
A 4.5 h.p. twin Campion outfit which conveyed the Southwell, Notts, Junior F.C., from dressing room to playing ground, a distance of half a mile, in one instalment. Total weight of passengers was 16 cwt. 2 qrs.

## BROOKS Policy for 1916

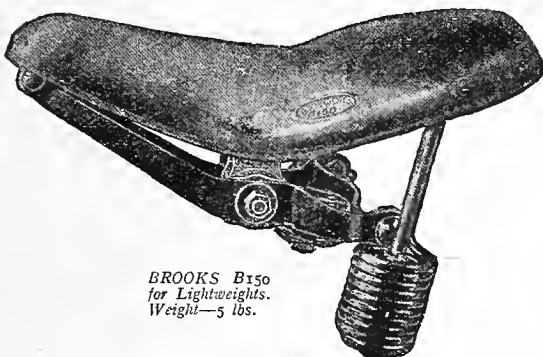
is the same as it has been ever since we made our first saddle some thirty-six years ago—Quality first. We *know* our saddles are the best made, yet we are continually endeavouring to improve them—constantly trying to find fault with them, because we are determined you shall not.

Our saddles for 1916 are the result of thirty-six years' tireless research and we offer them knowing them to be as good as even our knowledge and experience can make them.

J. B. BROOKS & CO., LTD., 49, CRITERION WORKS, BIRMINGHAM.



BROOKS B170.  
Weight—7 lbs. 12 oz.



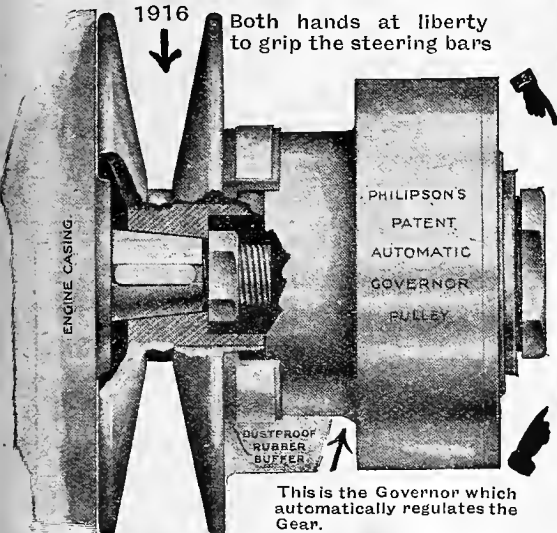
BROOKS B150  
for Lightweights.  
Weight—5 lbs.

**YOU** cannot purchase a simpler or more perfect variable gear.  
**AS SUPPLIED TO HIS MAJESTY'S**

(No holes or grooves in pulley flanges.)

1916

Both hands at liberty  
to grip the steering bars



This is the Governor which automatically regulates the Gear.

Douglas machines are wonderfully improved by fitting the Governor—Clutch models excepted.

THIS GEAR HAS A WORLD-WIDE REPUTATION FOR SIMPLICITY AND EFFICIENCY.

SOLE MAKERS: **PHILIPSON & CO., Engineers, ASTLEY BRIDGE, BOLTON.**  
Telegrams—"Safety, Bolton." ESTABLISHED OVER 30 YEARS. Telephone—147, Eagley.

Orders and enquiries in LONDON and DISTRICT, please apply Newsome & Fletcher, 3, Sandringham Parade, Ealing, W.

In answering these advertisements it is desirable to mention "The Motor Cycle."

## FORCES (MOTOR CYCLE SECTION) PHILIPSON'S PATENT AUTOMATIC GOVERNOR PULLEY

Thousands of our Governor Pulley Gears in use at home and abroad.

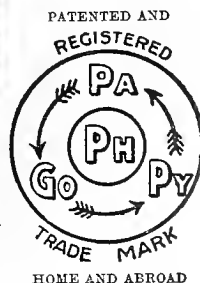
Extract from letter received Dec. 26th, 1915.

"Your pulley has been in use on my 1912 T.T. Roadster Triumph for three years and has given the utmost satisfaction, enabling the machine to climb any hill including Vale St., Bristol."

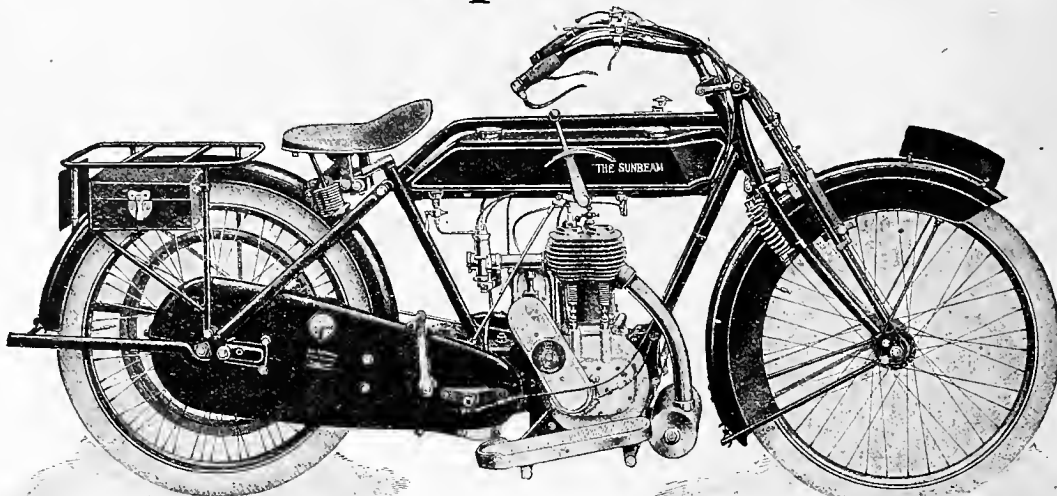
(Signed) S.B., Sub-Lieut. R.N.

ACCEPT NO GEAR AS GENUINE UNLESS IT BEARS THIS TRADE MARK

ENTIRELY FREE from troublesome and weighty complications—only **2 working parts**—no levers, rods, wheels, etc., to worry about. Simply takes the place of the ordinary pulley (one nut only secures the complete gear to the engine)—can be fitted without any alteration to most engines in a few minutes—Send for booklet.



# THE 1916 3½ h.p. SUNBEAM



PRICE, £73 10s.

Coach-built Sidecar to match, 17 GUINEAS.

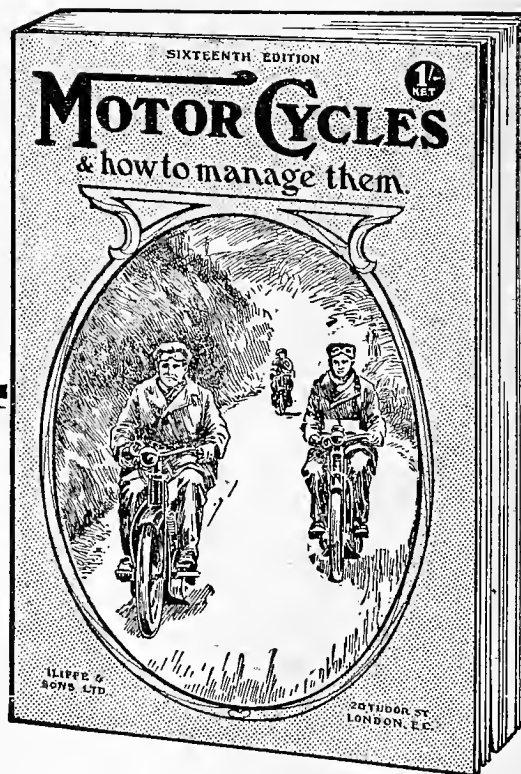
The Best "Solo or Sidecar" Mount of 1916. Silent—fast—easy starting.  
Sunbeam Workmanship and Finish throughout.

COMPLETE CATALOGUE POST FREE ON APPLICATION TO—

**JOHN MARSTON LTD., — 11, Sunbeamland, — WOLVERHAMPTON.**

London Showrooms: 57, Holborn Viaduct, E.C., and 157-158, Sloane Street, S.W.

To enjoy motor cycling  
*thoroughly*  
you must understand  
your machine  
*thoroughly*



Get  
the  
16th  
Edition  
(Revised)  
of this  
useful  
book

"MOTOR CYCLES & HOW TO MANAGE THEM"  
— the standard handbook for motor cyclists — will  
tell you practically all you want to know about  
your machine.

There is no doubt as to the supremacy of this book over all others of a similar kind. It is constantly being checked and revised by the staff of "The Motor Cycle," and consequently carries the weight and authority of this journal.

Its contents embrace a multitude of subjects relating to motor cycles, their care and management. It is clearly written and well illustrated. Every motor cyclist—whether beginner or experienced rider—should keep a copy handy for reference.

Price  
1/-  
Net

By  
Post  
1/4

Obtainable from ILIFFE & SONS Ltd., 20, Tudor St., London, E.C., and all booksellers and bookstalls.

**Motor Cycle Exports Compared.**

Although the general exports of the country have decreased about 27% as compared with 1913, the motor cycle exports (including parts) have only dropped to the extent of practically 17%. Full information will be found on page 39.

**The New Lighting Regulations.**

A map published on page 38A of this issue explains at a glance the new lighting regulations and where they apply. A point to bear in mind is that the Metropolitan Police area, having its own special regulations, is not affected by the new rules that came into force on Monday last.

**Petrol Imports.**

The high price of petrol is evidently not caused by any shortage of this useful spirit, for the Board of Trade returns show that the amount imported during 1915 was no less than 144,939,700 gallons. This is more than 18,000,000 gallons in excess of the previous year's imports and upwards of 44,000,000 gallons more than in 1913.

**The National War Funds.**

At the week-end the principal war funds stood as follow:

The Prince of Wales's National Relief Fund	(£2,893,000 distributed)	£5,699,666	0	0
The Weekly Dispatch Tobacco Fund		96,396	0	0
The Times Fund for the Sick and Wounded		3,108,674	0	0
The Queen's Work for Women Fund		168,073	17	0
Belgian Relief Fund		1,280,000	0	0
The Farmers' Red Cross Fund		222,000	0	0

**Twin-cylinder Two-stroke Engines.**

In the article on "Twin-cylinder Two-stroke Engines," which appeared on December 30th, the names of the Scott and the Premier are coupled together, but, though these engines are representative of the type having parallel cylinders, they have nothing else in common. The Scott is really two engines placed side by side, but the Premier has no partition in the crank case and does not employ crank case compression, having a separate receiver for the mixture. The remarks which follow the mention of these machines are general, and do not refer to any particular engine.

**SIDECARS AND ACCESSORIES.****SPECIAL NUMBER of JAN. 27th**

will be divided into the following sections:

- (1) SIDECARS.
- (2) GENERAL ACCESSORIES.
- (3) TYRES AND CLOTHING.
- (4) IGNITION APPLIANCES & LAMPS.

The usual features will, of course, be retained.

**New Models in this Issue.**

The following new machines are described and illustrated in this issue:

292 c.c. Diamond.

Two-stroke Hobart.

Weatherproof tandem-seated Excelsior sidecar outfit.

8 h.p. Sunbeam.

**A Farewell Dinner.**

Many motor cyclists who have come into contact with him will greatly regret to learn that Mr. Victor S. Welsford has resigned his position as manager of the Harley-Davidson Motor Co., Ltd. To bid farewell to his many friends in the motor cycle business, in the press, and on the staff of Messrs. Harley-Davidson, Mr. Welsford gave a farewell dinner party at the Holborn Restaurant on Thursday last. The company began serious business in this country after the war had started, and naturally it had an uphill fight. Mr. Duncan Watson presented Mr. Welsford, on behalf of the staff, with a handsome gold cigarette case and an illuminated address, couched in the most grateful terms. Mr. Welsford, in reply, said that he had done his duty, and could not have done it but for the help and co-operation of the staff, and he thanked everyone from the bottom of his heart. He had found American business methods hard. He himself was an Australian, and had English ideals, and he had done his best, but the principals and he had agreed to differ. Of the very large number of Harley-Davidsons which had been sold, over 3,000, in fact 50%, were in the possession of military men

of this country or of the Allies. Of his old staff seven had joined the Colours, and every available man had attested, including himself. He hoped shortly to be serving his King and Country.

**From Cape Town to Enlist.**

The latest recruit to the Motor Machine Gun Service is William Boylin, hon. sec. of the Cape Peninsula Motor Cycle Club, who has come home specially to enlist. There are no vacancies at present in the M.M.G.S. except for such men as Boylin, who have been travelling some weeks and were accepted tentatively prior to their departure overseas. Boylin has acted as hon. secretary of the Cape Town M.C.C. for the past three years, and the doings of this energetic body are well known to our



W Boylin (M.M.G.S.)

readers, the competitions having been described and illustrated from time to time by our local correspondent. During his five years' stay in South Africa Boylin estimates that he has ridden 20,000 miles. Boylin brought away with him an excellent recommendation from the president of the Cape Peninsula M.C.C., Mr. Duncan McMillan, whose name is well known to Scottish readers. Boylin is an expert marksman, and was a N.C.O. in the Cape Town M.I.

Two other readers expected this month as recruits for the M.M.G.S. hail from Sydney, New South Wales, and Trinidad, B.W.I.

**A Natal Hill-climb.**

With summer in full swing south of the Equator many competitions are being held in those of our Overseas Dominions so situated. Of course, with such a magnificent response from Overseas to the Mother Country's call for fighting men, trials are not so plentiful or so well supported as in days of peace, but in South Africa, Australia, and New Zealand there are enough men left to justify an occasional competition.

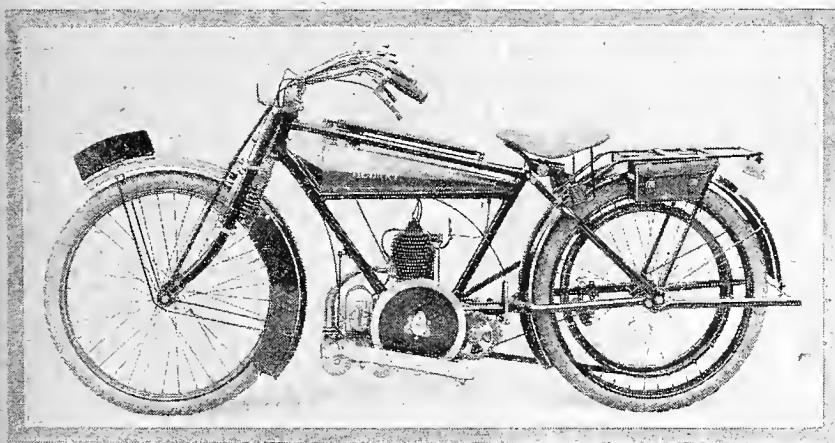
The Pietermaritzburg Motor Cycle Club held a hill-climb on November 13th, when *The Motor Cycle* formula was used,

Time<sup>2</sup> x c.c.  
i.e.,  
Weight

**Results:**

- ON TIME.
1. H. B. Morcom (3½ h.p. A.B.C.)
  2. A. R. Morcom (3½ h.p. A.B.C.)
  3. R. Goodwin (2¾ h.p. A.J.S.)
- ON FORMULA.
1. R. Goodwin (2¾ h.p. A.J.S.)
  2. J. C. Hunter (2¾ h.p. A.J.S.)
  3. A. R. Morcom (3½ h.p. A.B.C.)

From the above it will be seen that honours were shared by A.J.S. and A.B.C. machines.

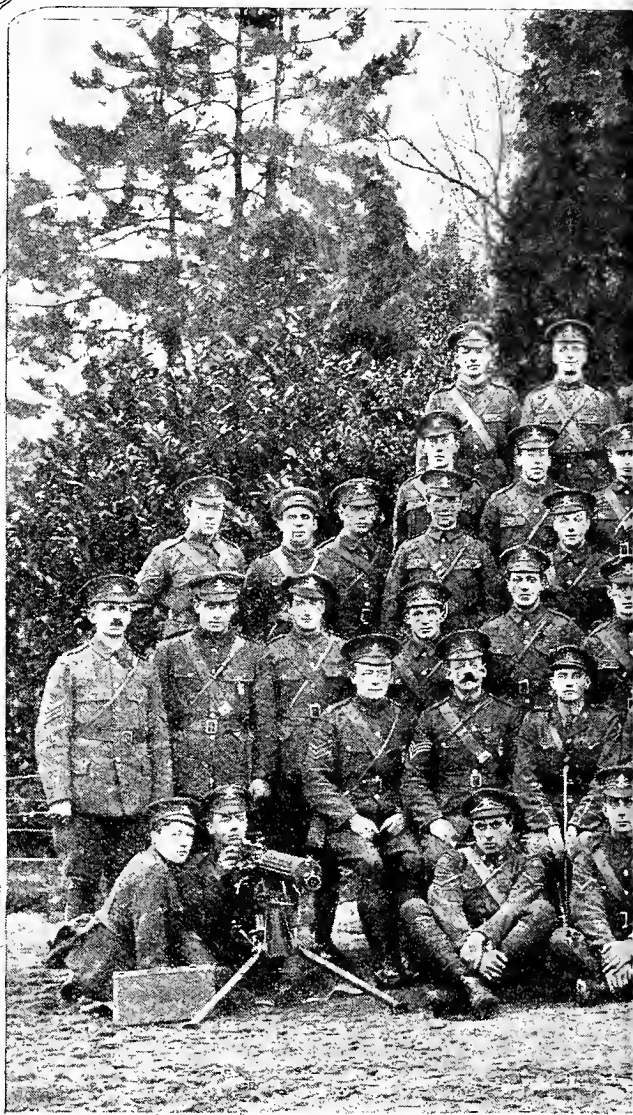
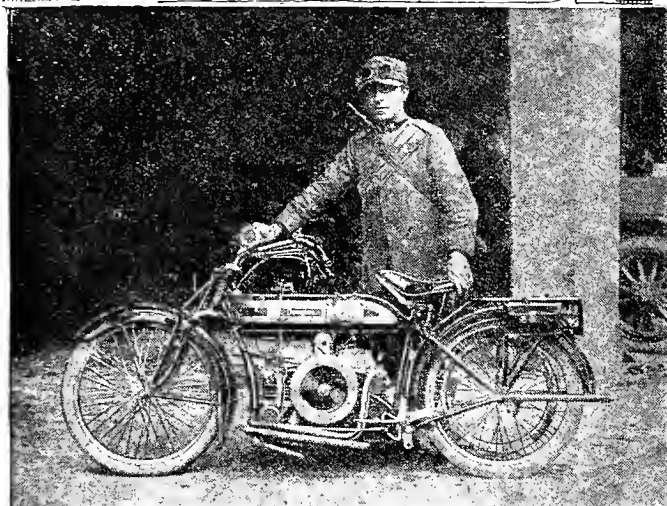


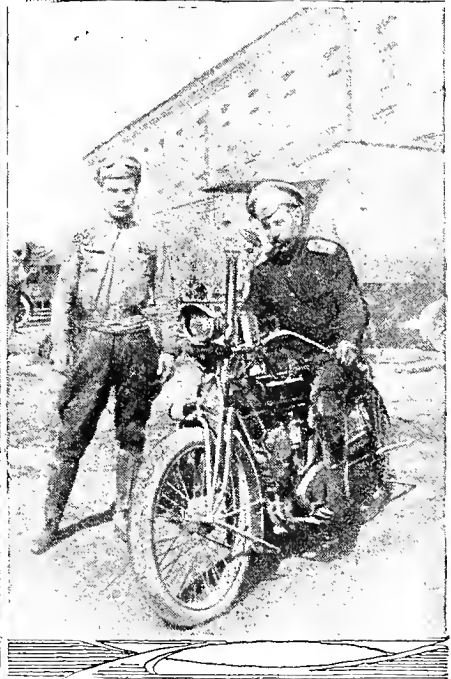
Flywheel side of the 1916 model 2½ h.p. two-stroke Hobart described on page 38. Chain-cum-belt drive and a two-speed countershaft gear are fitted



# Military Motor Cyclists in the Service of Great Britain and her Allies.

OFFICERS, N.C.O.'s, AND MEN OF A  
MOTOR MACHINE GUN BATTERY  
SURROUNDED BY DESPATCH RIDERS  
OF OUR GALLANT ALLIES.





The M.M.G. battery shown is the 24th, which may be overseas by the time this issue appears. An Italian despatch rider (D. Malvisi, a well-known Italian competition rider), on a 4 h.p. Douglas, is shown on the left-hand. Below is a French rider of a Triumph returning to the trenches with supplies of tobacco and newspapers. Canadian and Russian despatch riders, both mounted on Indians, are shown on the right. The row of men below the M.M.G. battery are the Douglas-mounted despatch riders attached to the 30th Div. Sig. Coy. R.F.

# A Central Control for Despatch Rider Recruits.

New War Office Memorandum. A.C.U. Secretary's Appointment.

FROM time to time we have referred to the unsatisfactory position of many motor cyclists being placed on the different waiting lists of the various motor cyclist reserve committees in different parts of the country, when, in reality, there was little chance of their being called up, owing to the length of the list and the very limited call for men of this class—about ten per month from each section. During 1915 it was no unusual thing for some of the inspecting officers to have lists extending to several scores of names and for an inspecting officer on the other side of England to be issuing urgent appeals for men. Though ourselves wrapt up in recruiting for the Motor Machine Gun Service—an entirely different section, be it understood—the position became so confused that at the end of last summer we entered into communication with some of the different secretaries concerned, e.g., the Rev. F. W. Hassard-Short, Lieut. H. Smith, Mr. T. W. Loughborough, and Mr. S. W. Phillpott. Subsequently we wrote to the War Office explaining the weaknesses of the present scheme and urging the adoption of a central office. Then Mr. T. W. Loughborough, who himself was alive to the anomalous position, laid a workable scheme before the War Office. The out-

come is the recruiting memorandum, dated January 1st, 1916, which has now been issued, specifying the A.C.U. as the central office, and we give below extracts from the amended instructions which are being issued to all the secretaries of the reserve committees and inspecting officers for the Royal Engineers, Signal Section. This does not mean that there are now vacancies for despatch riders; its main object is that motor cyclists of every district shall have an equal chance of being accepted, provided, of course, they are experienced and qualified for the positions.

"In order to ensure that men shall have an equal opportunity for enlistment in the Motor Cyclist Section, Royal Engineers, throughout the United Kingdom, it has been decided to reorganise the present system and to establish one central office to allocate the vacancies amongst the motor cyclist reserve committees.

"The central office will decide the number of men who may be on the list of each motor cyclist reserve committee.

"The motor cyclist reserve committees will keep these lists of suitable men, and will furnish the Central Office with nominal rolls of candidates, showing the dates of their being placed on the list, and with Army Forms B 210.

"When the Commandant, Signal Service Training Centre, or the Officer, 1/c Royal Engineer Records calls for men, the Central Office will submit the names of candidates with their Army Forms B 210. The Central Office will communicate to the reserve committees concerned the names of those selected, and will return their Army Forms B 210.

"Central Office.—T. W. Loughborough, Esq., Auto Cycle Union, Pall Mall, S.W."

## Advice on an Important Question.

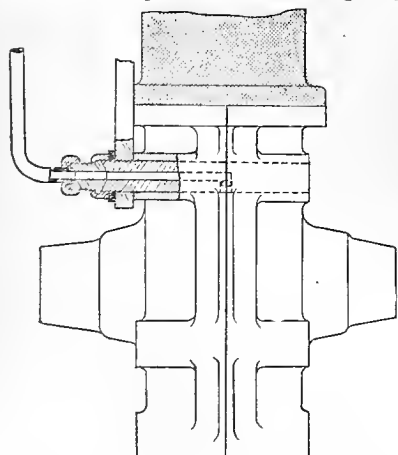
In reply to a common query (upon which the W.O. memorandum throws no light), Mr. Loughborough writes:

"As regards the position of men on a waiting list who have been attested under the Group Scheme, I would advise all those who are called up to apply to be put back to a later group. When I have the information I want from the Commandant, Training Centre, I can more definitely say when such men will be required by the R.E., and shall be in a position to give such men a letter which should facilitate their application for postponement of joining up. The actual decision as to whether such a man must go into the infantry at once or would be permitted to wait his turn for the R.E. will be given by the Tribunals."

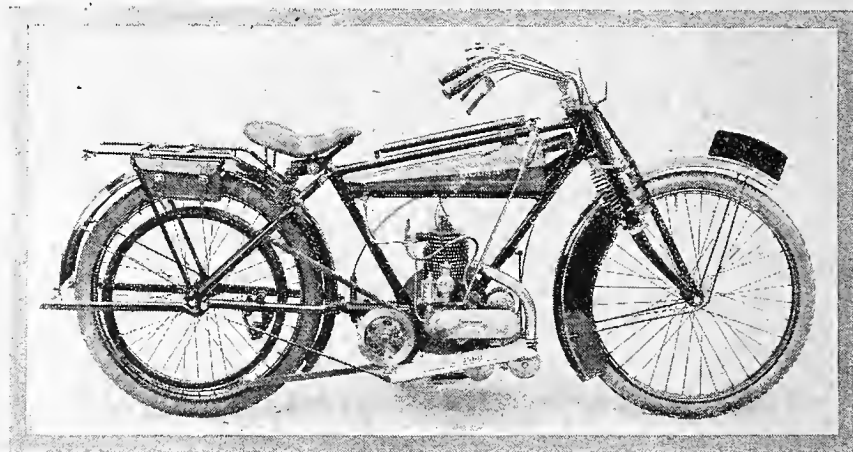
## Hobarts for 1916.

Improved Frame Design giving Low Riding Position. A Spring Frame under Test.

THE new 1916 model two-stroke Hobart, produced by Messrs. Hobart Bird and Co., Ltd., Coventry, the experimental model of which we described in our issue of November 25th, is now ready. The sloping top tube and wedge-shaped tank—the two chief features of the new model—with the black finish and gold lines, make an extremely attractive little mount. The dropping of the top tube not only gives an extremely low riding position, the top of the saddle being only



System of lubrication on the 1916 model two-stroke Hobart. The oil is introduced into the engine via the hollow crank case bolt.



Right hand side of the latest two-stroke Hobart

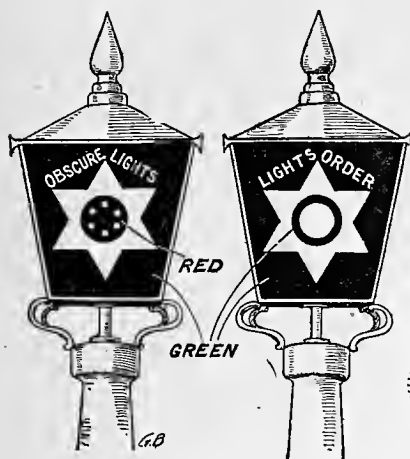
Note wedge-shaped tank and dropped top tube.

28in. from the ground, but it also enables a long steering head to be used, while at the same time the strength of the whole frame is increased. The engine is a 2½ h.p. Villiers, 70 mm. bore and stroke, with a capacity of 269 c.c. The lubrication, by Best and Lloyd, drip feed, is now via a special hollow crank case bolt instead of to the induction pipe. The other details, such as the countershaft gear with its substantial chain and belt transmission, the gear change being actuated from the handle-bar, the aluminium footboards and the heel-operated

brake, are not altered for the coming year. A single-speed model, which is exactly similar to the two-speed machine except that footrests instead of hoards are fitted, is also listed. During our visit to the Hobart Works the whole place seemed to be very busy, and we noticed a large stack of front forks ready for the new machines; these forks, which are of the Druid pattern, are, however, manufactured completely in the works. The firm is experimenting with a spring frame, but it is not expected that much will be done in this direction until after the war.

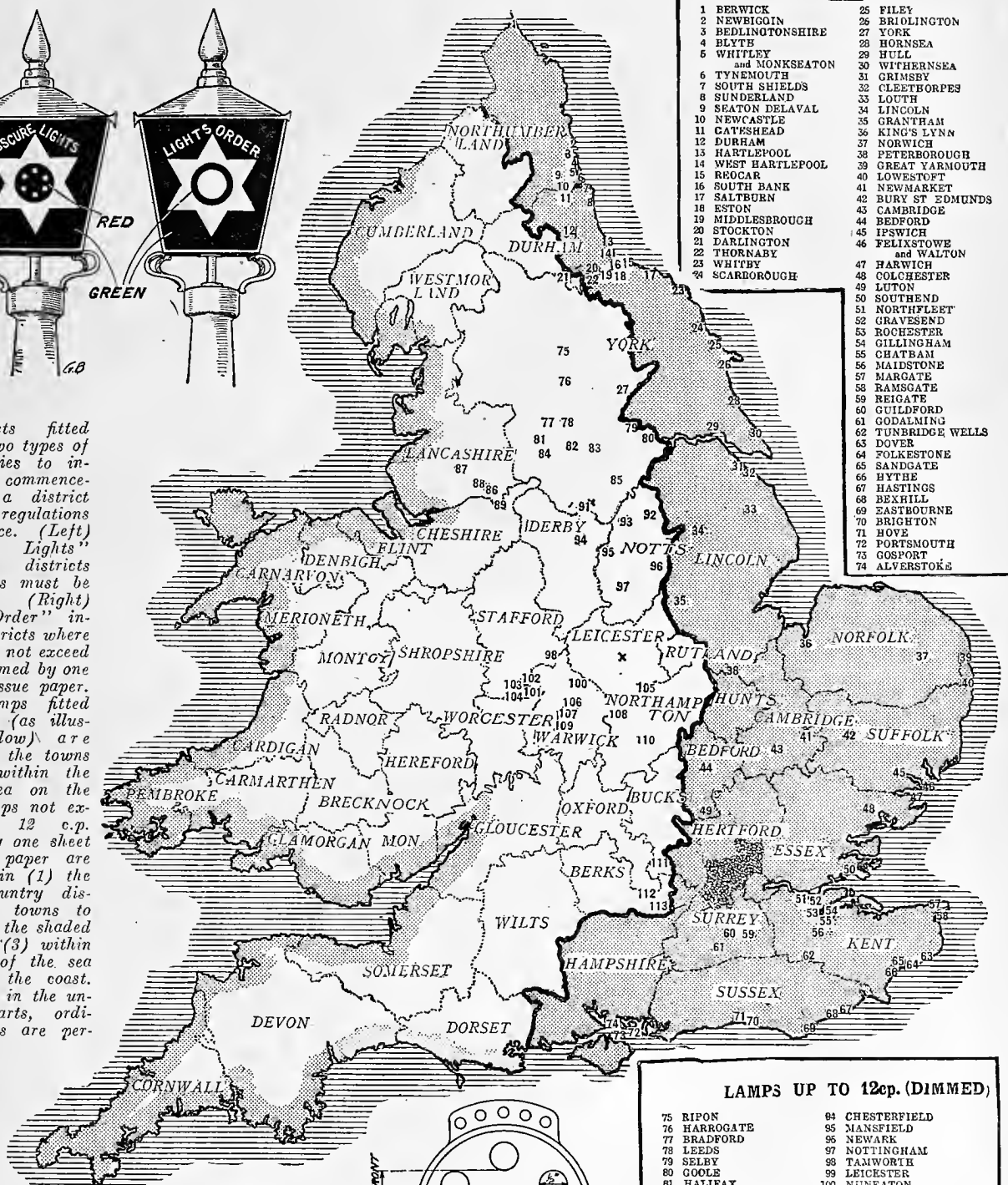


# The New Lighting Regulations in a Nutshell.



Lamp-posts fitted with the two types of transparencies to intimate the commencement of a district where the regulations are in force. (Left) "Obscure Lights" indicates districts where discs must be fitted. (Right) "Lights Order" indicates districts where lamps must not exceed 12 c.p. dimmed by one sheet of tissue paper.

Only lamps fitted with discs (as illustrated below) are allowed in the towns indicated within the shaded area on the east. Lamps not exceeding 12 c.p. dimmed by one sheet of tissue paper are the limit in (1) the shaded country districts, (2) towns to the left of the shaded area, and (3) within six miles of the sea all round the coast. Elsewhere, in the unshaded parts, ordinary lights are permissible.

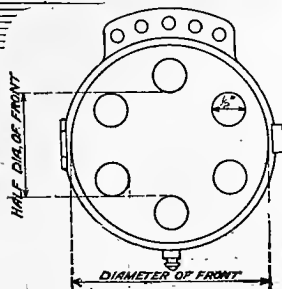


## SCREENED LAMPS ONLY

1 BERWICK	25 FILEY
2 NEWBIGGIN	26 BRIDLINGTON
3 BEDLINGTONSHIRE	27 YORK
4 BLYTH	28 HORNSEA
5 WHITLEY	29 GULF
6 TYNEMOUTH	30 WITHERNSEA
7 SOUTH SHIELDS	31 GRIMSBY
8 SUNDERLAND	32 CLEETORPES
9 SEATON DELAVAL	33 LOUTH
10 NEWCASTLE	34 LINCOLN
11 CATSFHEAD	35 GRANTHAM
12 DURHAM	36 KING'S LYNN
13 HARTLEPOOL	37 NORWICH
14 WEST HARTLEPOOL	38 PETERBOROUGH
15 REOCAR	39 GREAT YARMOUTH
16 SOUTH BANK	40 LOWESTOFT
17 SALTBRUN	41 NEWMARKET
18 ESTON	42 BURY ST EDMUNDS
19 MIDDLESBROUGH	43 CAMBRIDGE
20 STOCKTON	44 BEDFORD
21 DARLINGTON	45 FELIXSTOWE
22 THORNABY	46 FELIXSTOWE and WALTON
23 WHITBY	47 HARWICH
24 SCARBOROUGH	48 COLCHESTER
	49 LUTON
	50 SOUTHEND
	51 NORTHFLEET
	52 GRAVESEND
	53 ROCHESTER
	54 GILLINGHAM
	55 CHATBAM
	56 MAIDSTONE
	57 MARGATE
	58 RAMSGATE
	59 REIGATE
	60 GUILDFORD
	61 GODALMING
	62 TUNBRIDGE WELLS
	63 DOVER
	64 FOLKESTONE
	65 SANDGATE
	66 HYTHE
	67 HASTINGS
	68 BEXHILL
	69 EASTBOURNE
	70 BRIGHTON
	71 HOVE
	72 PORTSMOUTH
	73 GOSPORT
	74 ALVERSTOKE

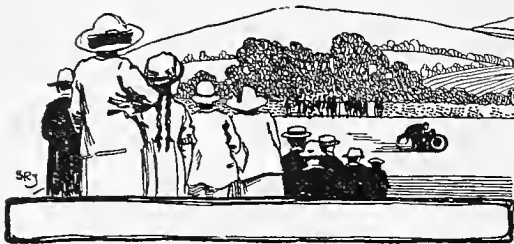
## LAMPS UP TO 12c.p. (DIMMED)

75 RIPON	84 CHESTERFIELD
76 HARROGATE	85 MANSFIELD
77 BRADFORD	86 NEWARK
78 LEEDS	87 NOTTINGHAM
79 SELBY	88 TAIWORTH
80 GOOLE	89 LEICESTER
81 HALIFAX	90 NUNEATON
82 DEWSBURY	91 BIRMINGHAM
83 WAKEFIELD	92 WEST BROMWICH
84 HUDDERSFIELD	93 SMETHWICK
85 DONCASTER	94 OLDBURY
86 MANCHESTER	95 MARKET HARBOUROUGH
87 SALFORD	96 COVENTRY
88 STRETTFORD	97 LEAMINGTON
89 STOCKPORT	98 RUGBY
90 ROTHERHAM	99 WARWICK
91 SHEFFIELD	100 NORTHAMPTON
92 RETFORD	101 HIGH WYCOMBE
93 WORKSOP	102 READING
	103 WORKINGHAM



On the right is a lamp fitted with the regulation type of perforated disc (showing official size of holes), which has to be fitted in the districts where the more stringent regulations apply.





## AUSTRALIAN T.T. RACE.

### BRITISH SOLO AND SIDECAR SUCCESS: 39½ m.p.h. for 150 Miles on a 2½ h.p. Mount.

THE West Australian 150 Miles Tourist Trophy Race, which took place on Monday, October 25th last, is the event of the year in the Antipodes. The bare result of the race was given on page 16 of our last issue. It was run on handicap lines, the handicap largely being framed as a result of competitors' previous performances in this particular road event.

It was as long ago as 1904 that the first long distance motor cycle race was held in Australia, a rider of a 2 h.p. Minerva getting home first. By reason of being accustomed to racing over very bad road surfaces in West Australia, competitors in races in that part of the world greatly fancy their chances in the British Tourist Trophy Race, and it has been suggested, and, indeed, practically decided, that on the occasion of the next T.T. race, the West Australian expert, H. V. Norton, shall come over to this country in an attempt to carry off the British T.T. Riders at home will welcome Australian racing experts as they have done other Overseas representatives. It is a curious fact, however, that no competition man from over the water has done himself justice in the Manx T.T.'s of the past. Norton's expenses will be borne by the West Australian Motor Cycle Club.

The triangular course of this year's event was from Perth to Guildford, then to York, Northam, and Lloyd Crossing, and back to Perth *via* Bailup, and the official times of the survivors are as follow:

					h. m. s.
1.	L. PERRY, 3½ Rudge (handicap, 45m.) ...	...	...	3 52 50	
	Average speed, 38½ m.p.h.				
2.	H. V. NORTON, 2½ Sunbeam (handicap, 35m.) ...	...	...	3 47 22	
	Average speed, 39½ m.p.h.†				
3.	C. J. LEWIS, 7 Indian (scr.) ...	...	...	3 18 31	
	Average speed, 45½ m.p.h.*				
4.	E. Sylvester, 3½ Premier (handicap, 55m.) ...	...	...	4 23 35	
	Average speed, 35½ m.p.h.				
5.	G. Hard, 3½ B.S.A. (handicap 59m.) ...	...	...	4 32 35	
	Average speed, 33 m.p.h.				
6.	H. Myers, 7 Indian (handicap, 15m.) ...	...	...	4 1 25	
	Average speed, 37 m.p.h.				
7.	G. Davidson, Triumph ...	...	...	6 4 0	
8.	R. E. Webb, B.S.A. ...	...	...	6 23 0	
	* Fastest time.				
	† Second fastest time.				

The winner, L. Perry (3½ h.p. T.T. Rudge Multi), received a start of forty-five minutes from the scratch man, C. J. Lewis (7-9 h.p. Indian).

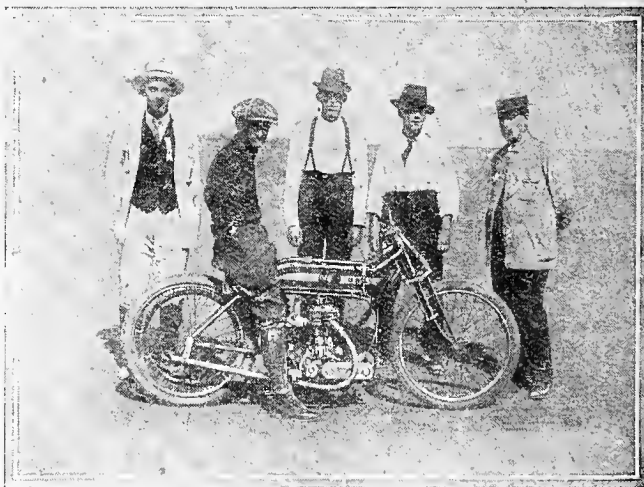
Norton, who was first in 1913, riding a 3½ h.p. Triumph, and second in 1914, when mounted on a 2½ h.p. Sunbeam, was this year to have ridden a 3½ h.p. Sunbeam, which had been specially sent out to Australia, but as it arrived only the day before the event, it was decided that L. Hope should ride the machine. This rider, despite the fact that he was not acquainted with the make, actually led at half the distance, when a horse suddenly ran out of the bush and collided with him. There were one or two other falls *en route*, some of them due to the nature of the

road. Lewis put up a magnificent ride; indeed, he and Norton had alternately occupied the first position in the races since 1912, which consistency has earned for them the reputation of being the finest riders in West Australia. Norton, though mounted on a machine of such small dimensions as 75×79 mm., and giving a start to quite a number of riders of 3½ h.p. mounts, came very near to winning, and put up the second fastest average of the day, viz., 39½ m.p.h., which is remarkable. This average would have been improved but for the fact that a piston ring of Norton's machine broke away from the step cuts, so allowing oil to get past the piston and on to the plug. Later in the run the plug gave out, and necessitated a change. Lewis, the scratch man, averaged 45½ m.p.h., which gained him third place.

Perry, the Rudge rider, proved a popular winner, his only stops on the road being to change a belt and to replace a broken fastener.

#### Result of the Sidecar Class.

In conjunction with the motor cycle race a sidecar event was arranged, seven competitors starting, no fewer than five of them on 4 h.p. B.S.A.'s, the other two being mounted on a 4 h.p. Calthorpe and a 7-9 h.p. Pope respectively. The winner turned up in W. Franz (B.S.A.), who received eighteen minutes start from the Pope rider. Franz's time was 5h. 1m. 7s., which beat the previous record by about an hour. The performance was considered exceedingly good; Franz had his *fiancée* as passenger. Wilson occupied second place, arriving at the finishing post 45m. later. These two were the only competitors to finish.



Some officials of the Goldfields Motor Club, of Western Australia, photographed on the occasion of a race meeting on the bed of Lake Perkolille, twenty-two miles from Kalgoorlie. Reading from left to right: T. H. Russell (secretary), H. Myers (who has won many events on his B.S.A.), W. J. Plant, E. Ryan, and H. Murfin.



## The Year's Trade in Motor Cycles.

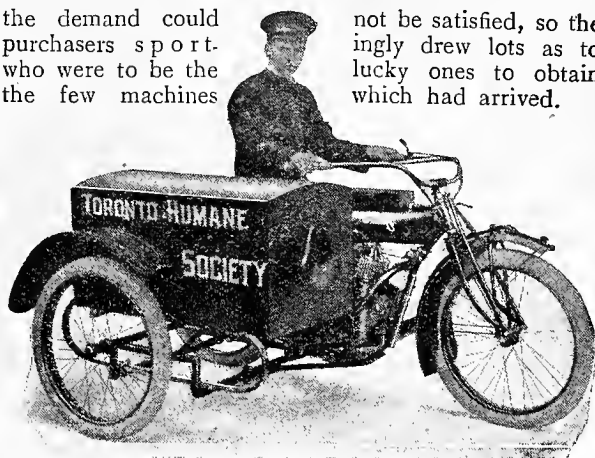
### The Monthly Returns of Imports and Exports for 1914 and 1915 Compared.

**I**N giving particulars culled from Board of Trade returns of the imports and exports for the past two years, it will be noticed that since the outbreak of war in August, 1914, the exports have been decidedly on the small side, and very naturally so, whereas, on the other hand, the imports, which consist practically entirely of American machines and parts, have increased to a considerable extent, especially towards the end of the summer months.

The many reasons for the falling off in British production are well-known to our readers, and so in the scarcity of home-made goods the agents have made up their stocks from outside sources. It is very gratifying, however, to notice that during the last few months the exports have gradually increased from 637 machines in September to the splendid number of 1,690 for November, showing an increase over 1914 figures of 316 machines, whereas, on the other hand, the imports have steadily decreased from 437 in September to 105 in November. That there will be a big demand for British machines overseas when the manufacturers are able to start exporting again in any numbers is almost certain. The following story, which we have already recounted, helps to prove this. On the arrival in Pretoria of a small consignment of British machines there was such a rush for them that

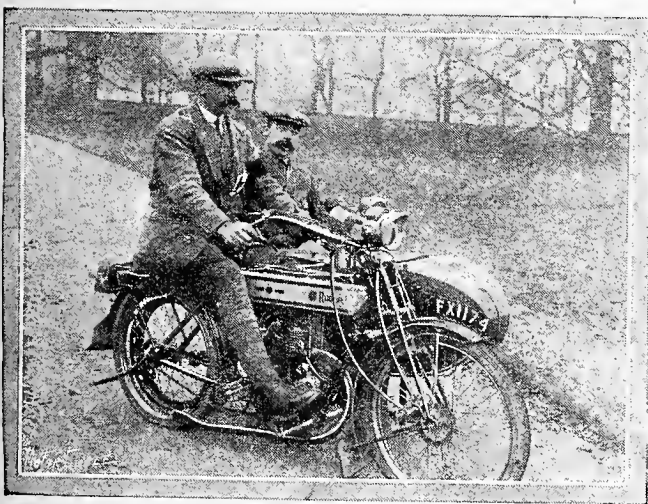
the demand could purchasers sport who were to be the few machines

not be satisfied, so the ingly drew lots as to lucky ones to obtain which had arrived.



#### LUCKY DOGS!

Toronto bow-wows who are unfortunate enough to be run over in the public streets now enjoy the luxury of an Indian sidecar to rush them off to the Humane Society's veterinary surgeon. The London Canine Society has used a sidecar for the transport of homeless cats and dogs for some time past.



#### MOTOR CYCLIST RED CROSS WORKERS.

A Dorchester reader, A House, who has been using his Rudge and sidecar for sixteen months in work for the 5th Dorset V.A.D., of which he is an old member.

IMPORTS.				EXPORTS.			
1915.		1914.		1915.		1914.	
No.	Value.	No.	Value.	No.	Value.	No.	Value.
Jan. 125	£5,461	183	£6,351	Jan. 1,289	£15,696	1,432	£88,285
Feb. 501	£25,397	351	£24,338	Feb. 474	£35,430	1,595	£95,822
Mar. 63	£12,337	378	£21,391	Mar. 770	£57,768	1,782	£104,709
Apr. 476	£39,154	310	£21,478	Apr. 942	£71,372	1,945	£113,223
May 331	£34,200	288	£21,522	May 858	£65,221	2,106	£126,233
June 822	£65,671	400	£23,109	June 1,020	£68,162	1,958	£119,934
July 495	£37,827	172	£19,814	July 881	£64,601	2,089	£125,860
Aug. 645	£38,582	97	£9,577	Aug. 1,092	£79,866	1,324	£77,121
Sep. 437	£30,126	36	£6,278	Sep. 637	£52,188	1,004	£63,875
Oct. 314	£23,161	280	£13,239	Oct. 880	£64,825	1,124	£84,474
Nov. 105	£17,754	12	£2,103	Nov. 1,690	£124,543	1,374	£95,233
Dec. 217	£23,032	52	£4,325	Dec. 1,065	£90,545	1,101	£74,030

#### Totals for the Year.

IMPORTS.				EXPORTS.			
1915.		1914.		1915.		1914.	
No.	Value.	No.	Value.	No.	Value.	No.	Value.
4,531	£363,323	2,559	£187,661	10,979	£820,217	20,877	£1,305,250

N.B.—The value represents complete motor cycles, also parts and accessories.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

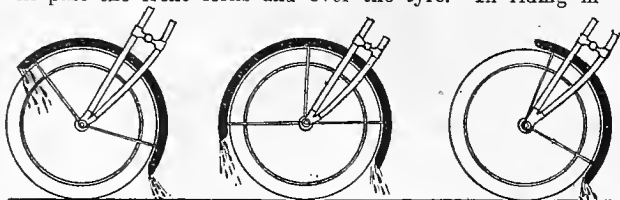
#### Fallen Trees.

Sir,—I notice in your issue of December 30th two paragraphs relating to fallen trees. Coming back from Christmas leave about 5.30 p.m. on the Bath-Gloucester road, I had the misfortune to run into a fallen tree across the road. I was fortunately uninjured, but the machine, a  $\frac{3}{4}$  h.p. twin Indian, suffered considerably.

N. HEYWOOD.

#### Improving Mudguards.

Sir,—There is one point about modern mudguards which might easily be improved. The front mudguard is carried well past the front forks and over the tyre. In riding in



Front mudguard design. (Left) Present type. (Centre) Suggested improvement. (Right) Old type. See letter from R. Troward.

wet weather a continuous stream of mud is thrown by the front wheel on to the mudguard. Part of this trickles down the end and is distributed on the rider's feet, if no stop is fitted. The rest—presuming the front projects over the centre of the wheel—runs in a continuous stream on to spokes, wheel, and hub. After a long winter ride the front wheel of a modern machine is coated with an inch or two of mud, whilst an older machine, with shorter mudguards, is often comparatively clean. This is one of the little points which manufacturers do not heed. RIDER TROWARD.

#### British Machines for British Riders.

Sir,—It would be an injustice to the American manufacturers to allow "Cuckoo's" letter to go unchallenged. We are not at war with America, and many of your readers will agree with me that your correspondent "Cuckoo" is allowing his patriotism to run away with him.

Does he mean that a British purchaser (say one like myself, who has taken twenty years to save up the money), after most careful investigation and comparison, believing that he will get more for his money in an American machine than in a British one at the same price, should choose the British one?

\*Why is it not possible to purchase a British machine of 7-9 h.p. for £68 with the wonderful mechanical-automatic (or fool-proof) lubricating system, the 28in. wheels and 3in. tyres of the Americans? If a buyer fancies these three items on his machine, could he be expected to accept something smaller, and of less value for his money, because it was British? In other words, is the quality of our patriotism to be judged by the smallness of the value we are prepared to accept from wealthy British firms in return for our hard-earned money? Besides, why doesn't a British firm step forward with a twelve months (instead of three months) guarantee?

Personally (being a man who has to work fifteen hours a day for my living), I should consider it my duty to myself and to my family to get the best value I could for

my money, whether it was British or American. Another point, many of our own makers cannot supply machines, as they are busy with Government work (for which, of course, they are paid), and one firm asks you to wait six months, while another wants you to wait until the war is over, for delivery. Now, does "Cuckoo" think that if we patriotically waited so long these firms would, in return, serve us at a fair and honest price, and not take any advantage of the great demand and small output which would result? Or would they run up their prices and make it impossible for a poor man to own a motor cycle at all? "Cuckoo" should be quite satisfied with the tax of 6s. 8d. in the £ imposed upon American machines, and he should be willing for neutral and friendly countries to trade with one another. He must be a real "cuckoo" if he thinks we could live otherwise.

W. CARTWRIGHT.

[\*Setting aside the patriotic question, we should be glad to know what American 7-9 h.p. motor cycle to our correspondent's specification can be bought for £68.—Ed.]

Sir,—Your issue of December 30th contained a letter from one "Cuckoo" expressing what must be the views of the majority of your readers, and for which I have been looking for some time in your correspondence columns. I expected to see in your issue of January 6th one or two letters backing up the gallant writer, with, possibly, a note from the editor that such letters only represented a selection from a voluminous correspondence of the same tenor. But no; and though of an excessive diffidence by nature, I will wade in where experts are apparently too indifferent to tread. There is no doubt that the purchase by a British person of an alien motor bicycle or car is a grossly unpatriotic act at the present time, and will be so for years to come.

The facts ought to be stated plainly and without varnish, as they would be in America if the rôles of the respective countries were reversed. In the first place, it is a matter of the buyer's personal interest. Dozens of our manufacturers turn out machines giving far better value for money—better material, wearing qualities and appearance, and, therefore (most important), better second-hand value, than any alien machine, and capable of doing all and more than the most advertised imported article. Secondly, there arises a matter of moral principle.

All our manufacturers are giving their plant, time, and best brains almost exclusively to the service of their country, facing the almost certain loss of their regular business drifting to other quarters; they are losing "goodwill" daily—a goodwill built up at large expense and by a peculiarly British trade conscientiousness and fair dealing—and it is a poor recompense for their self-sacrifice to allow, and even encourage, the American importer to take his callous advantage. The American is drawing gold by the millions from this country when we can least afford it, and the gold is going to the country least fit to have it.

Think! We are fighting this war for principles of justice, liberty, and "might is not necessarily right" against the most savagely brutal and cold-blooded monsters this poor old globe has ever had to support. We are a bloated mediæval monarchy, a feudal anachronism, a back number in the realm of modern progress, according to the sons of the land of liberty. But they lend no support by their responsible Government or by any attempted expression of popular opinion to the crushing of the perpetrators of the foulest and most despicable outrages ever committed

against unarmed women and children since the history of the world began (about 1492, I believe, according to popular American chronology). Further, one prominent American manufacturer (wild sparking plugs will not drag his name from me) actually loves the poor innocent Hun—a moral obliquity only attributable, I think, to a cracked cylinder.

The American nation is merely out to make money out of the war, and doesn't care a red cent who wins so long as it can make a record profit and collar the belligerent markets for such time as any belligerent cash is left. It has established its ethical standard on a cash basis.

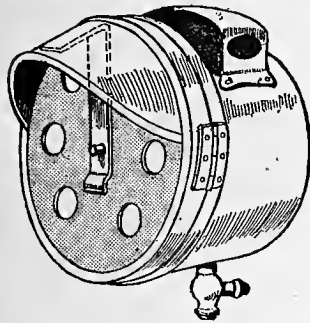
This is a cold fact, though poetically expressed to rivet the attention! Our own markets *must* be preserved for our own manufacturers in all branches of our trade for the sakes of those now serving, and who have to live when the war is over.

It will have to be done by legislation, if private morality is not sufficient. In any case, a paper of your circulation and standing can, and, indeed, is bound to help at least one great British trade, whose reputation has never been better or record finer than it is to-day. PENROT.

#### Fitting Head Light Discs.

Sir,—I am sending you a rough sketch of a method of fitting a disc to a motor cycle head light which might be of interest to some of your readers who have frequently to fit and remove the disc, and who require something more permanent than one made from paper or cardboard. It is not difficult to make, and can be very quickly fitted and removed.

The disc is made from a sheet of tin, and is fitted on the outside of the lamp, resting on the metal front. It is kept in position by a clip made from a piece of spring steel soldered or riveted to the inside of the hood. The clip has a hole fitting over a peg riveted in the centre of the disc, and to remove the disc it is only necessary to lift the end of the clip.



Showing how a quickly detachable obscuring disc may be fitted to a motor cycle lamp

I have attached a disc in this manner to a lamp, and it seems in every way satisfactory. R. O. CLARK.

#### The Mysterious Sidecar.

Sir,—I fully appreciate the remarks made by both your correspondents, but I think that they have missed the main idea I was trying to bring out.

Many aeroplane chassis are horrible things, as Mr. Smith suggests, and he is wrong in thinking it is bridges I am objecting to. Far from it, I am merely pointing out that if a chassis is rigid, and yet fastened more or less harshly to a motor bicycle, there will be a series of exceedingly powerful shocks transmitted to the whole frame which really should never pass beyond the points of junction.

The modern sidecar is not an attachment, and I have proved myself that flexibly-built machines can be made cheaply, and that they will stand any amount of knocking about, just as an aeroplane landing chassis stands shock which it could never cope with were it made of rigid steel tubing.

Then again, I can assure Mr. Smith that a reasonable amount of springiness makes a machine most pleasant to drive. It makes as much difference to comfort and to the lasting properties as does the addition of a spring fork to a rigid cycle frame.

Mr. Henderson takes rather the same line. If he admits the facts that over the course of an A.C.U. Six Days Trial practically not one single sidecar finished up without suffering severe damage, how can he possibly say that my statements are "too sweeping"?

Which is the better ideal, a sidecar machine built like a car and costing almost as much (with the driver perched up on a saddle), or a sporting attachment which does not even break up over rough roads so frequently as its heavier brothers?

Then Mr. Henderson speaks of the springing of modern sidecars. He is certainly wrong on this point, because they are not sprung better than a farmer's cart except for pneumatic tyres. A sidecar is sprung in the same way as a farmer's labourer puts a springy board across the bars of a farm cart, and most sidecars are the equivalent of cars having the axles and chassis rigidly attached to the wheels with the body of the car slung above them!

Surely the mechanism ought to have the road shocks smoothed out for it just as much as the body of a passenger. It certainly will not last if this is not done.

I do not doubt the comfort of the Henderson or other good sidecars. I have possibly done as much mileage in them as your correspondent, but it hurts my sense of justice to see the solid mass of sidecar, axle, wheel, and bicycle bumping into irregular pot-holes and visibly bending in the process, when it is not designed to take this bending which we know must take place.

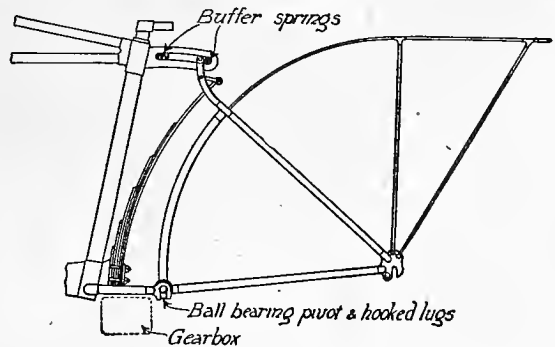
I would like to say that I thoroughly appreciate the interesting remarks made on this subject.

A. M. LOW, A.C.G.I., D.Sc., etc.

#### Spring Frame Design.

Sir,—I enclose a sketch and description of a spring frame which I have patented and desire to place on the market.

The rear part of the frame is built rigid, and moves on a pivot of similar construction to the pedal bracket of a



Mr. H. Humphreys's suggestion for a spring frame.

push bicycle. The spindle is bolted firmly in hooked lugs, which make removal of the rear wheel and rear portion of the frame easy. The top end of the moving portion is held in line by curved slotted plates, between which are buffer springs to receive severe shocks and recoil. The normal springing is controlled by the leaf spring.

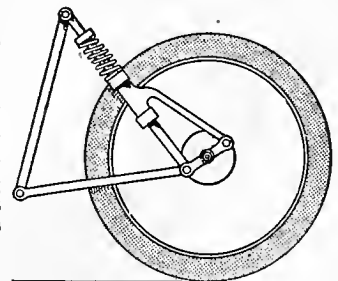
H. HUMPHREYS.

Sir,—I am an interested reader of your paper, and the interest with which you have invested the important question

of rear springing for motor cycles has encouraged me to submit the effort in this direction which I enclose. The merit which I claim for my idea is obviously simplicity, the system of dual struts which my design involves being very similar to that employed on some types of front spring forks. Of course, the length of spring and the friction entailed by the movement of the slide might be matters of individual taste. The spring, or rather springs (for the arrangement would be the same for each side of the wheel), could be made adjustable, and the slide could easily be run on ball bearings.

I think my design quite applicable to lightweight machines, if not to sidecar and heavier made ones.

P. MILLS.



Spring frame design evolved by Mr. P. Mills, whose descriptive letter is published on this page.



### Lightweight Sidecar Outfits.

Sir,—As every year sees an increase in the number of two-stroke lightweights with sidecars on the road, it would be interesting to have some more riders' experiences of these. Do the belts and chains stand the weight of a sidecar long without breakage? Also what about the petrol consumption of a 350 c.c. two-stroke and sidecar and the advantages (or otherwise) of an automatic carburettor?

TWO-STROKE RIDER.

### A Short Trip in the Lake District.

Sir,—One of the wildest as well as prettiest mountain rounds in the English Lakes is that beloved of the pedestrian from Keswick past Derwentwater to Borrowdale and Seatoller, thence over Honister Pass to Buttermere, from there over Newlands Pass to Braithwaite and Keswick—a distance of about twenty-two miles.

Any motorist possessing a bicycle of not less than 4 h.p. could and should make the journey. He would be amply repaid for any trouble entailed. The surface of the track on the passes is naturally very bad, that of Honister being particularly so, as will be seen from the adjoining photograph taken just underneath the crag itself. The second photograph is of the same pass nearing the bottom, the surface here being much improved.

The beauty of Derwentwater, the jaws of Borrowdale which open at your approach, the wooded wildness of Seatoller, the grandeur of Honister, the solitude of Buttermere, the refreshing green of Newlands slopes, and the sylvan dale that leads to Braithwaite are items not often packed into such a short trip.

Notwithstanding the fact that this journey was made amidst the showers, when the roads were extremely greasy, it is one that I shall take the very first opportunity of repeating.

(Mrs.) M. BROOKE.



Taking a 4 h.p. Triumph and sidecar through the Honister Pass. (See letter from Mrs. Brooke on this page.)

are as good as the Norton for pace, for simplicity, or for general comfort. The steering is very good, due to the big rake of the front forks, and the engine is vibrationless throughout its big range of speed.

If this letter should catch Capt. Lindsay's eye, I should be much obliged if he would inform me how much Oildag he uses in a gallon of Price's Huile de Luxe, winter grade, and also what advantage the Senspray has over the variable jet B. and B.

I have tried both Amac and B. and B. carburettors on my machine, and find the B. and B. more powerful and much more economical than the Amac, but curiously enough the engine will knock on the B. and B. and not on the Amac.

I only weigh nine and a half stone, and for some five months rode the machine on a 4 to 1 gear with excellent results, except for very occasional knocking, e.g., when accelerating quickly from a right-angled turn. I lowered the gear to 4½, and was very agreeably surprised by the increased acceleration and the absence of knocking.

With the B. and B. carburettor, travelling at an average speed of 25 m.p.h. over give and take roads, I get 105-110 m.p.g. The usual disclaimer!

R. E. BROWN.



### On the Road with a 3½ h.p. Scott Sidecar Outfit.

Sir,—In your last issue "Maj. Grout" queries the accuracy of my statement with regard to the low weight of flywheel on the Scott engine. In proportion to the impulse, the Scott flywheel is, of course, as heavy as any other, but I understand that its actual weight is about 18 lb., whereas your correspondent will probably find that the flywheels of the 3½ h.p. four-stroke single weigh something in the neighbourhood of 30 lb.

I certainly think that the light flywheel of the Scott engine has a good deal to do with its quick acceleration, though I agree with "Maj. Grout" that the absence of friction caused by oil round the flywheels is a factor to be considered. On four-stroke engines of early pattern much power was lost by over-oiling, owing chiefly to oil friction in the crank case, but on modern engines greater clearance is provided between the flywheels and the inside of the casing, so that the loss is not so considerable.

With regard to wear of rear tyre, everything depends upon the individual machine, vitality of engine, action of clutches, and so on. It is obviously impossible to lay down hard and fast rules, and I am not surprised that "Maj. Grout" obtains better results on his Scott than with a four-stroke single or twin.

H. MORTIMER BATTEN.

### Some Fads and Fancies.

Sir,—I have read with much interest the article by Capt. Lindsay, and I absolutely endorse all his remarks re his ideal motor cycle. I also have been riding a 1915 T.T. Norton with Philipson pulley, and consider the machine ideal.

I have owned small twins, two-strokes, and a 3½ h.p. overhead valve twin, all recent models, but none of them

### A Ride through a Bush Fire.

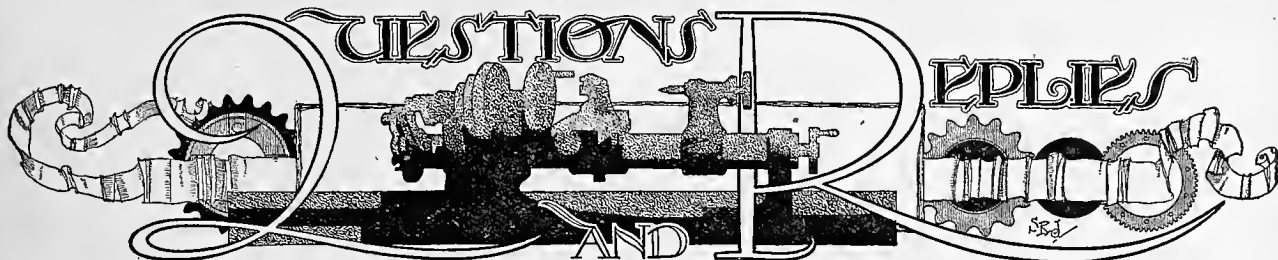
Sir,—A run we had through the Bush when it was on fire may interest your readers.

We left Brisbane one Saturday morning, intending to have a run to a Bush township. We thought it would be cooler riding a motor cycle than to stay in the city and get stewed—it was 120° in the shade—so we formed a party, and left for Burleigh Heads, a town in the Bush some sixty miles away. Everything went well till we came to Dead Man's Gully—the half-way rest. The people there told us that the Bush was on fire between Dead Man's and Burleigh Heads, but we said that as we had come thus far we might as well go on. Little did we know what was brewing for us! The road we were travelling on was a typical Australian road made by the bullock teams sniggling timber from the scrub—all big ruts and bumps. When one's wheels got into these the footboards were level with the road. We bumped and joggled along for three miles, and then we struck the Bush fire. The fire was from one side of the road to the other. Phew! It was hot! One of the party who was riding ahead dropped a tin of gasoline from his carrier on to the road, and it burst. Then I guess we had some fire. It was no use waiting for it to cool down, for all around us the Bush was blazing, so we just rode through it. It was awful! A tree would fall across the road and send up a shower of sparks, which, as a rule, found a resting place down our backs. Anyway, we got through it all, and when we came to a creek everybody dived in. Then we struck black soil—the dread of the Australian motorist—3ft. in dust; we skidded all over the road. We arrived in Burleigh Heads all right, with only one of the party complaining that his eyebrows were singed. We travelled back by train!

This I think will give you an idea what motoring in the Bush is like.

Brisbane, Queensland, Australia.

N. BOYLE, JUN.



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

#### Gear for Hill-climbing.

Which does a motor cycle engine the more harm—to try and get up a steep hill on top gear (if possible), or to change down to the bottom gear? Personally, I think it gives power to the engine and also less strain if the bottom gear is used.—J.M.

The great thing is not to let the engine labour. If it is obviously in distress, change into bottom gear at once. Naturally, there is less strain on the engine than when "hanging on" on top speed, and, of course, continuous power is transmitted to the road wheels when the low gear is in engagement.

#### Knocking on a Two-stroke.

I should be obliged if you can tell me the probable cause of a violent knocking on the high gear with a 1911 twin two-stroke and sidecar; gears, 4½ to 1 and 8 to 1. I have only just got the engine back from being overhauled. A new piston has been fitted. Now this is not the same as the older one in the other cylinder. The new piston is very much curved on top, whilst the old one is perfectly flat. The knocking occurs when picking up even on low gear, and continues until both cylinders roar, then it disappears, returning when changing into high gear, and gradually ceasing as the engine turns over faster or into the usual hum. There is also an excessive vibration at high speeds. This is unusual for the machine, and it never happened before. Please tell me also the best setting for platinum points for regular and even firing, and should the magneto be timed when the piston is exactly at the top, or before or after?—J.B.

It is very difficult to say what causes the knocking in your engine, especially as the engine has just been overhauled. It is possible that the new piston is too tight a fit; this could cause knocking. You should make certain the engine is firing regularly in both cylinders, and that both are getting an equal quantity of oil. Both pistons should be exactly the same shape and weight, otherwise you will get uneven running. The difference in the pistons may account for the excessive vibration, as it may have upset the balance of the engine. You should make sure that the ignition is not too

far advanced. The spark should occur about the top of the stroke with the ignition lever fully retarded. On no account have the timing more advanced than this, or you will be unable to run with the ignition advanced, which it is desirable to do to obtain the best spark. The contact points should separate .4 mm.; that is, roughly, the thickness of a visiting card.

#### Wanted, a Foot Warmer.

I have a 3½ h.p. two-speed motor bicycle and sidecar. My wife complains of the cold, and I wonder whether it would be possible to transfer the exhaust gases from the silencer (which is incorporated with the magneto bracket) to the foot of the sidecar and so make a foot warmer. Do you think this could be done inexpensively and be a success? If so, would you please be so good as to advise me how to set about the job?—W.J.H.

The fitting of an exhaust-heated foot warmer would be quite simple. All you would have to do is to connect a metal box or cylinder to the silencer of the motor cycle by means of a length of flexible metallic tubing, taking care that the tube is not made gastight by means of rubber packing. An outlet to the box in the sidecar should be arranged, and a regulator of some kind fitted between the silencer and the warming box. Such a device is actually on the market.

#### Engine Noise.

I own a 1915 2½ h.p. four-stroke. A few weeks ago it developed a sort of harsh rattle in the engine, particularly when going down hill or over twenty miles per hour; the noise then became very bad, causing the footrests and handle-bars to vibrate unduly. Could you please tell me (1) what the trouble is? (2) if it should be sent to the makers, or local repairers, or left alone?—G.H.

We are afraid you cannot well diagnose the trouble without taking the cylinder off and testing if there is any vertical play in the big or little end bearings or in the main shaft. We should hardly think it would be worth sending the machine back to the makers, but we should imagine you could find out the cause of the trouble yourself, or get it done locally. It may be only caused by an excess of carbon deposit, which you

could remove yourself, or it may be that the bearings are worn and need to be renewed. A faulty plug often gives bad running by causing pre-ignition, which might account for the vibration.

#### Lack of Power.

I have purchased an old 3 h.p. motor cycle with a.o.i.v., to which I have fitted a 1913 3½ h.p. model Amac carburetter.

I have also ground in the valves and removed all the carbon from the cylinder and piston. The rings are free in the grooves, the compression is good, and the bearings are in good order. The machine runs evenly and fires regularly, and develops good power while on the stand. I can scarcely stop the engine by applying the foot brake, but when on the road it fails to give sufficient power to pull the machine alone. The magneto timing is correct, and it gives a good spark. It has been at the garage for six weeks, but is no better now than before. I have a No. 30 jet in the carburetter, which has recently been overhauled by the makers. (1.) Can you tell me which is the correct way for the throttle slide in the carburetter? (2.) What can I do to improve the power of the engine when on the road?—E.W.E.

(1.) On the top of the carburetter there should be a small projection, which should register with a hole in the carburetter top. When these two register the slides should be in their correct positions. You can also tell whether they are in their correct positions by seeing whether the respective slides are in the following positions: The throttle is the large outside slide, and should face the opening to the engine, while the smaller inside slide is the air, and should face the main air intake opening in the carburetter. (2.) The fact that your machine gives no power on the road may possibly be due to it being geared too highly. It should be geared about 5 to 1, or even 5½ to 1. The automatic inlet valve must not be fitted with too strong a spring. You should be able just to shake the valve open when holding it by its seating and jerking it against your hand. Make sure the exhaust valve is seating properly and that there is neither too much nor too little clearance between the valve stem and tappet. This should be about one-sixty-fourth of an inch.

**SPECIAL NOTICE.**—Copies of "The Motor Cycle" may only be sent to neutral European countries if posted direct from the offices of the publishers, or by newsgents who have obtained permission from the War Office for this purpose. The publishers of "The Motor Cycle" have obtained the necessary permission, and, consequently, can send subscribers' copies as usual. Before sending through newsgents it is important to enquire if permission has been obtained, as otherwise copies intended for neutral European countries will not be forwarded by the Post Office.

**The Local Taxation Licence.**

**?** I purchased an 8 h.p. motor cycle in 1914, and in 1915 took out a local taxation licence. Later, after having sold this machine, I bought a second-hand lightweight. Recently a policeman called and demanded that I should take out another licence for this machine. Please tell me if this is in order.—E.S.

As you did not possess two machines at the same time, you would be quite within your rights in refusing to pay the second local taxation licence. This licence entitles you to keep and use one motor bicycle. We trust you made this quite clear to the policeman.

**Difficulty in Starting.**

**?** Could you kindly tell me—(1.) Why it is that my machine, a  $4\frac{1}{2}$  h.p. chain-driven single, will only occasionally, and then with extreme difficulty, start with the kick starter? (2.) That oil is continually oozing through the exhaust valve and tappet? (3.) That sometimes when trying to start by running and with the exhaust lifted fully the rear wheel refuses to turn and skids along the ground?—A.I. 1185.

(1.) The trouble is probably due to air leaks in the induction pipe or carburettor unions. For some reason or other the mixture is not strong enough for easy starting. Make sure the plug points are clean and adjusted correctly, separating about  $\frac{1}{32}$  in. The contact points should also be moving freely and should separate .4 mm. (2.) This leads one to suppose that the tappet guide is worn, or you may be using too much oil. A faulty

crank case valve might also cause it to blow out of the tappets. (3.) The trouble mentioned here is due to the valve not lifting sufficiently high, or to a back-fire, or the oil may be rather too thick and be gumming the engine up. Before trying to start you should free it by injecting a little paraffin or petrol through the compression tap and turning the engine round once or twice to allow the oil to work past the rings.

**A Badly Carried Out Repair.**

**?** I have just had my cylinder reground and fitted with a new piston. The cylinder walls are now slightly rough. I find that the engine gets terribly hot and then refuses to pull even when in low gear and on the flat. It has now run twenty miles and appears to be no better than at the end of the first mile. (1.) Were the walls left rough in order that the rings could rub them smooth? (2.) If so, when can I reasonably expect this smoothness? (3.) Can anything be done to minimise the overheating prior to the cylinder getting into condition?—L.H.V.

(1.) The walls should certainly not have been left rough. (2.) The only way that the roughness can be smoothed out is by means of a special grinding tool, the use of which requires a considerable amount of skill. All we can suggest is that you take up the matter with the people who undertook the work, and see what they have to say. (3.) If the cylinder and piston are a good fit the machine should run well, and should not overheat. It is not, however, uncommon not to get such good results from an engine the cylinder of which has been re-

ground and a new piston fitted until it has been run about 200 miles so as to allow the new parts to become sufficiently run in.

**READERS' REPLIES.****Starting a Big Single.**

I would suggest that "E.H.B.'s" difficulty in starting up is due not to his engine, but to his hub gear being gummed by the cold weather. I presume it is a plate clutch. I recently found the same difficulty with a Triumph fitted with Sturmey-Archer gear and plate clutch. By washing out the hub with petrol and re-oiling with a lighter oil I am now able to start up again at first kick. I used Price's Huile de Luxe winter grade on re-lubricating, having previously used the summer grade.—P.P.

**Cover Blowing Off.**

I have read with interest in *The Motor Cycle* the experience of your correspondent "P.E." with regard to cover blowing off, and also that of "M.W.T." who had a similar experience, and how the latter got over his trouble by buying a new rim to fit his tyre—a Dunlop 1915 extra heavy 26x2 $\frac{3}{4}$ . Last spring I fitted a similar tyre to my back wheel, replacing a 1913 Hutchinson Passenger, and had only gone about three miles when the cover blew off, jammed in the forks, and the tyre was destroyed. The foreman in a local garage fitted a new tyre same make, but cut off  $\frac{1}{4}$  in. all round the widest of the two flaps, as we found the cause of cover coming off was that the widest of the two flaps came right across rim into bead on the opposite side and prevented bead of tyre from bedding into the groove on rim. I have gone 1,000 miles up to now without any trouble. Anyone who wishes to fit a 1915 tyre on the old 2 $\frac{1}{4}$  in. rim can easily do so with the help of a pair of sharp scissors, as the whole trouble of blowing off is caused by the extra width of flap going into bead. I hope this will be a help to some reader.—FAIR PLAY.

**EXPERIENCES WANTED.**

Readers desirous of obtaining the experience of others with various motor cycles or accessories must enclose a stamped addressed envelope in which the replies may be forwarded. Answers to the queries should be addressed c/o The Editor.

"P.M.D." (Brighton) and "J.D.M." (Cardiff).—De Luxe T.D.C. lightweight. Reliability, maximum speed, and consumption.

"C.A.H." (Bexhill).—3 h.p. 1915 Enfield. Consumption, speed, reliability, ease of starting, gear, and Binks carburetter.

**RECOMMENDED ROUTES.**

TUNBRIDGE WELLS TO ARUNDEL.—R.C.

Tunbridge Wells, Eridge, Crowborough, Uckfield, Lewes, Brighton, Shoreham, Broadwater (Worthing outskirts), Patching Pond, Cross Bush, Arundel.

WENDOVER TO WITLEY.—A.H.W.

Wendover, Amersham, Beaconsfield, Slough, Windsor, Egham, Chertsey, Woking, Guildford, Godalming, Milford, Witley.

**MOTOR CYCLES ON COUNTRY ESTATES.**

This year an unusual amount of timber is being felled, and stewards and others are making good use of motor cycles in visiting various scenes of activity. Above are seen lumber men at work in Bolton Abbey Woods, with a  $3\frac{1}{2}$  h.p. Sunbeam sidecar in the background.



# My Farewell to Harley-Davidson Owners

**T**HE outstanding merit of the "Silent Grey Fellow" has been the means of my making hundreds of staunch friends amongst the Motor-cycling public of Great Britain, so that it is with feelings of keen regret that I announce my resignation as Managing-Director of the Harley-Davidson Motor Co., Ltd.

A short time ago our name was barely known in this country, while to-day the Harley-Davidson is very strongly entrenched in the market. The truly extraordinary success that has attended our efforts is a just reward for the energy and enthusiasm put into this business.

However, energy and enthusiasm alone would never have built up such a colossal business. It is your unstinted praise which you have so lavishly bestowed on your mounts that to a great measure accounts for the extraordinary success we have enjoyed.

In making my adieu, I thank you one and all first for the glad hand of friendship you have extended to me; secondly, for your praise, which alone has so materially enabled us to make good.

N.B.—Letters addressed Hotel Ivanhoe, Bloomsbury Street, London, W.C., will receive immediate acknowledgment.



# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILLIFFE & SONS Ltd.,** and crossed **& Co.**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Illiffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### A.B.C.

FOR A.B.C. and all makes motor cycles, write Morgan and Maxwell, the London Motor Mart, 80, High Rd., Stratham. 150 motor cycles in stock. Lists free. State requirements. [0749]

### Abingdon.

ABINGDON King Dick, 3 1/2 h.p., Bosch, good tyres, new Dunlop belt; bargain, £19, or nearest offer. —J. Parker, Paddock Wood, Kent. [8490]

### A.J.S.

A.J.S., 1916, 2 1/2 h.p.; £58.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

A.J.S., 1916.—New 6 h.p. 3-speed combination and 2 1/2 h.p. 3-speed models in stock.—Moss, Wem. [X8601]

A.J.S., 1916 models: immediate delivery.—Cyril Williams, Chapel Ash Depot, Wolverhampton. [X8682]

6 h.p. 1915 A.J.S. and sidecar, spares, 2,000 miles; £22.—Kidd, Emerald St., Saltburn, Yorkshire. [X8622]

A.J.S., 2 1/2 h.p., 3-speed, Nov. 1913) model, lamps, horn, and speedometer; £34/10.—Scuders, Garage, Kidderminster. [X8680]

A.J.S., 2 1/2 h.p., 1912, Bosch, B. and B., overhauled, accessories perfect; £20, or offer.—Pickard, 601, Green Lanes, Hounley. [X8845]

A.J.S., 1914, 2 1/2 h.p., 2-speed, clutch, kick start, lamp, horn, splendid condition, equal to new; £44.—Retallick, Burney House, Roche, Cornwall. [X8873]

## POSITIVELY YOU CANNOT MISS

Making a highly satisfactory choice if you get it at



The house that offers you your selection of Britain's largest stock of best makes. Every machine not only good, but fully guaranteed. Offered at absolutely lowest bed rock cash price, or easiest easy terms, or most liberal cash allowance made for present mounts in part payment of new.

## GET TO-DAY'S LIST. IT INCLUDES THESE:

B.S.A.'s, chain drive	£64 0
B.S.A.'s, chain-cum-belt drive	£62 0
SUNBEAM, 3 1/2 h.p.	£73 10
QUADRANTS, chain-cum-belt drive	£60 0
ALLON, single-speed	£31 10
ALLONS, 2-speed	£42 0
ALLONS, 2 speeds and clutch	£45 0
ENFIELD Combinations	£89 8
NEW IMPERIAL J.A.P.'s	£36 15
LEVIS, single speed	£28 1
JAMES, 3 1/2 h.p., twin	£66 3
JAMES, 4 1/2 h.p., Comb., dynamo lighting	£93 16
ENFIELD, 3 h.p., 2-speed	£52 10
ZENITH, 6 h.p., countershaft gear	£80 9
WOLF, 2-speed, 2-stroke	£32 11
BAT, 4 1/2 h.p., 2-speed	£60 7
CALTHORPE J.A.P.	£36 15
BAT, 6 h.p., 3-speed, 2B	£80 6

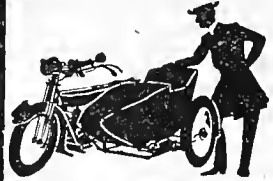
## SECOND-HAND MODELS.

No.	H.P.		
10000.	4	1915 3-sp. T.T. DOUGLAS	£50 0
10094.	2	1915 LEVIS	£21 0
10093.	3	1913 3-sp. ROVER Comb.	£42 0
10092.	3	1911 2-sp. N.S.U.	£20 0
10091.	2	1912 CENTAUR	£18 0
10085.	10	1913 2-sp. HENDERSON and Sc.	£56 0
10084.	3	Single-speed NORTON	£30 0
10081.	6	3-sp. J.A.P. and Sidecar	£32 10
10076.	4	1915 3-sp. B.S.A. and Sidecar	£65 0
10060.	7	1914 2-sp. INDIAN & Swan Sc.	£65 0
10059.	2	1915 2-sp. CALTHORPE J.A.P.	£29 0
10055.	3	1913 3-sp. ROVER and Sidecar	£42 0
10045.	4	1914 3-sp. TRIUMPH	£43 10
10043.	2	1914 ALLDAYS, 2-stroke	£17 10
10042.	2	1915 3-sp. DOUGLAS, Model U	£50 0
10039.	6-8 h.p.	1914 3-sp. ALLDAYS & Sc.	£60 0
10038.	3	1912 2-sp. B.S.A.	£35 0
10037.	4	1914 3-sp. WOLF	£36 0
10036.	12-16	1913 SUNBEAM Landulette	£460 0
10032.	6	1914 3-sp. Chain Drive REX and Sidecar	£50 0
10022.	4	1914 3-sp. B.S.A. and Sidecar	£57 10
10021.	3	1912 SWIFT	£22 0
10014.	7	1914 2-sp. HENDEE Special and Sidecar	£55 0
10000.	4	1915 3-sp. JAMES	£52 10
10007.	4	1915 3-sp. JAMES and Sidecar	£72 10
10009.	3	1909 F.F. TRIUMPH	£25 0
10112.	3	1914 countershaft ZENITH	£50 0
10113.	20	1915 5-seater FORD	£85 0
10117.	3	1911 F.E. TRIUMPH	£27 10
10120.	3	1914 RUDGE Multi	£35 0
10123.	3	1915 2-sp. ENFIELD	£42 10
10126.	6	1914 RUDGE Multi & Sidecar	£45 0
10127.	6	1912 ZENITH and Sidecar	£37 10
10128.	2	1915 2-sp. T.T. DOUGLAS	£42 10
9953.	2	1915 2-sp. 2-stroke TYLER	£27 10
9946.	2	1914 3-sp. T.T. FORWARD	£29 0
9938.	3	1915 3-sp. SUNBEAM	£67 10
9931.	6	1914 3-sp. A.J.S. and Sidecar	£73 10
9847.	4	1914 3-sp. QUADRANT	£45 0

## 9,

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## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

A.J.S., 1915, 2 1/2 h.p., semi T.T., 3-speed, and clutch, kick starter, lamp, horn, and tools; trial by appointment; £45.—Edward, Bungalow, Carnoustie. [X8754]

1915 6 h.p. A.J.S. Combination, absolutely in stock; this luxurious outfit complete only costs £102/10; exchanges, easy terms.—Julian, Broad St., Reading. 'Phone: 1024. [X1485]

A.J.S., 6 h.p., 3-speed countershaft, kick start, clutch, new Gloria sidecar, 2 head lamps, rear lamp, watch, mirror; bargain, £65.—Vickers, Newagent, Brandon Colliery, Durham. [X8870]

A.J.S., 1913 1/2, 6 h.p., Irv sidecar, Lucas lamps, speedometer, horn, mirror, spare tyre, chains, excellent condition, not done 5,000; £60.—32, Oxford Rd., Acoc's Green, Birmingham. [X8722]

SALE, 1915 6 h.p. A.J.S. combination, coachbuilt sidecar, lamps, horn, tool kit, spares, trip speedometer, and spare wheel, in first-class condition, not done 3,000 miles; 78 gns. can be seen by appointment.—D. H. West, 24, Holyhead Rd., Coventry. [X8909]

A.J.S., 1914, 6 h.p., 3-speed model, and A.J.S. sidecar, with screen, hood, and side curtains, Miller head light, electric side light, Jones speedometer, horn, and watch, spare tyre, new steel-stand on back tyre; £68.—Williams, Bartholomews Hospital, E.C. [X8562]

6 h.p. A.J.S., 1914, 3-speed countershaft gear and free engine, fitted with Gloria sidecar, fitted with Lucas lighting set, Lucas horn, rear light, tools, and spares; any severe trial given; mechanically sound, as new; 70 gns.; rare opportunity.—Wanchope's, 9, Shoe Lane, London. [X8827]

### Alldays.

ALLDAYS Allon, all models: immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0763]

ALLDAYS, 3 1/2 h.p., late 1912, with sidecar, excellent running order; £35, or nearest offer.—112, Bromyard Rd., Worcester. [X8675]

NEW Allons, 2-speed models £42, single-speed models £34; delivery from stock; cash or extended payments.—Wanchope's, 9, Shoe Lane, London. [X8829]

ALLDAYS Matchless, 1915 1/2, 3 1/2 h.p., Sturmey-Archer 3 speeds, kick-start, and coachbuilt sidecar, lamps, generator, etc.; cost over £70, price £55.—18, Malvern Rd., Dalston, London. [8418]

### Antoine.

3 1/2 h.p. Antoine Motor Cycle, C.A.V. mag., in good running order, complete with sidecar; must sell, £10/10.—Williams, Bridge House, Bexford, Suffolk. [X8395]

### Ariel.

ARIEL, 3 1/2 h.p., low; £4, bargain; good tyres; exchange.—29, Capstone Rd., Bournemouth. [8226]

ARIEL, 5 1/2 h.p., 3-speed combination, £93/10; and 3 1/2 h.p., 3-speed countershaft combination actually in stock; generous deferred payments, liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 90, High Rd., Wood Green. [X8332]

### Arno.

3 1/2 h.p. Arno Combination, 1913, good order, new tyres and belt; bargain, £25.—18, South Bruton Mews, Bond St., W. [8542]

SMART Arno Combination, 1914, 3 1/2 h.p., 3-speed, cane sidecar, well upholstered horn, lamp, Spray; 38 gns.—Railway Garage, Staines. [8557]

## MOTOR CYCLES FOR SALE.

## Auto-Wheels.

- UTO-WHEEL**, with or without gent's cycle; cheap.—Watts and Co., 2a, Argyle Rd., West Ealing, W. [8433]
- UTO-WHEEL De Luxe**, £15/15, 26/3 month; a second-hand standard model, £10.—Seen at 248, Bishopsgate, London. [8467]
- UTO Wheel**, attached to 3-speed Fleetwood cycle, ready for the road; £12/10; excellent condition; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X8828]

## Bat.

- BAT-J.A.P.**, 1913, 6h.p., in exceptional nice condition; £30.—Percy and Co., 337, Euston Rd., London. [8401]
- BAT**, 1915, 6h.p., 3-speed, brand new machine; listed £73/10, clearing at £65; very special chance.—Alexander's, 115, Leithian Rd., Edinburgh. [8258]

- 1912 Bat-Jap**, 4h.p. P. and M. 2-speed, in excellent condition, full kit; £25.—Tuke and Bell, Ltd., Motor Department, Carlton Engineering Works, High Rd., Tottenham. [8065]

- BATS**—The very latest up-to-date combinations supplied from stock: 6h.p. twins and 4h.p. solo twins, immediate delivery, with or without Bat sidecars. £50 we have for sale a 1915 second-hand 8h.p. combination, fitted with handsome underslung sidecar, 3-speed countershaft gear, includes speedometer and all high-class accessories; price £65, guaranteed.—Sole wholesale London agents, Wauchope's, 9, Shoe Lane, London. [X8830]

## Blackburne.

- BLACKBURNE**, 3-speed, 1914 model, B. and B., Boech, done 3,000 miles; £30.—A. J. Young, Newmarket. [8324]

## Bradbury.

- 1913 Bradbury**, 4h.p., 2 new tyres, T.T. bars, in tip-top condition, new belt, lamp, horn, etc., perfect; £24.—198, Moulsham St., Chelmsford. [8440]

- 1915 6h.p. Bradbury** and green De Luxe coachbuilt sidecar, 3 speeds, chain drive, detachable wheel; £72; getting car.—Allison, 4, Park Rd., Harrogate. [X8687]

- BRADBURY**, 1914, 2-speed, kick start, and 1915 coachbuilt Montgomery sidecar, all perfect; £35, or nearest offer.—Haughton, 2, Adenale Rd., Rane, lough, Dublin. [X8893]

- BRADBURY**, N.S.U. 2-speed gear, large P. and H. head lamp, Cowey speedometer, Caneole sidecar, wind screen, and spares; £33.—Beauchamp, 15, Matilda St., Hackney. [8461]

## Brown.

- £7-3/4h.p. Brown-Chater**, Druids, Boach waterproof, adjustable pulley, drip feed, Avons Sunstone tyres, Dunlop belt, as new.—32, Longley Rd., Tooting. [8342]

- BROWN Bros.** Motor Cycle, overhauled last week by motor engineer, engine good as new, new tyre; owner will ride to buyer within 20 miles; take £9/5.—Paine, Station Rd., Lydd. [8321]

## B.S.A.

- B.S.A.**, 1916.—New 4 1/4h.p. model K in stock, no waiting.—Moss, Wern. [X8802]

- B.S.A.**, 1916 model K, belt-cum-chain; £62, delivered home.—Barty's Garage, Stone St., Gravesend. [8320]

- B.S.A.**, 1913, 2-speed, in splendid condition; 28 gns., very great bargain.—Julian, Broad St., Reading. [X2345]

- B.S.A.**, 1915, 4 1/4h.p., and Phoenix cane torpedo sidecar, in good condition; £60.—Goodhew, Borough Market, London. [8295]

- B.S.A.**, 1914, 3-speed countershaft, coachbuilt sidecar, excellent condition; £56.—Lt. Fimring, 3/1 Bucks, High Wycombe. [8302]

- B.S.A.**, 1915 (August), all-chain drive, Fiteu Model de Luxe sidecar; No. 11; £65.—Bond, Bishopston Terrace, Stockton-on-Tees. [X8868]

- 1913 T.T. B.S.A.**, good condition, lamp, Lucas horn, new speedometer, all spares; £30.—Keene, St. James's Market, Bradford. [X8763]

- B.S.A.**, 1912, 3 1/2h.p., 3-speed Sturmev, kick start, extra good condition; £30.—Seen Stag Motor Works, East Finchley, London, N. [8489]

- B.S.A.**, 1916 model H, 4 1/4h.p., all chain drive, just delivered from works, all latest improvements; £64.—Hucklebridge, 133, Sloane St., London, S.W. [X8794]

- B.S.A.**, 1916 4 1/4h.p. K models, just delivered, chain-cum-belt, 3 speeds, kick starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton, London. [X8913]

- B.S.A.**, late 1913, chain drive, 3 1/2h.p., best lamps, horn, extra heavy Dunlops, coach sidecar, recent renewals £2; bargain, £40.—Hitchon, Tettenhall, Wolverhampton. [X8707]

- B.S.A.** Model H £63, K £62, actually in stock; generous exchanges, liberal deferred payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8334]

- B.S.A.** Model K Sidecar Combination, Lucas lighting outfit, and other costly accessories, been very little used, warranted perfect, equal to new; bargain, £75; exchange offers invited.—Bunting, Harrow. [8415]

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- 3 1/2 h.p. LEA-FRANCIS, 1915, nearly new, 3-speed, kick starter, Hercules £13 13 Sidecar, £5 5 speedometer, £3 10 lamp set; the whole cost £94 10 ..... £67 15  
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3 1/2 h.p. PRECISION, 1912, nice condition ..... £18 15  
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3 1/2 h.p. SINGER, 1912, 3-speed gear ..... £22 10  
3 1/2 h.p. L.M.C., 1913, countershaft gear ..... £25 10  
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3 1/2 h.p. REX, 1909, 2-speed gear ..... £13 10  
3 1/2 h.p. P. & M., 1909, 2-sp., with Sidecar ..... £18 15  
4 h.p. JAMES, late 1913, 3-speed, chain drive, kick starter, coach Sidecar ..... £43 15  
Light Delivery Car, 8 h.p. De Dion engine, 3 speeds, less tyres ..... £9 15  
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3 1/2 h.p. PREMIER, 1911, B.S.A. 2-speed ..... £19 15  
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- B.S.A.** 4 1/4h.p. Model H Combination, with wind screen attached, delivered from works September, 1915, used for holidays only; cost £82, accept £66, or cycle only £53.—Mr. Francis, 21, Newsham Drive, Liverpool. [X8871]

- B.S.A.**, 1915, chain-cum-belt, Lucas dynamo lighting set, Lucas electric horn, speedometer, watch, spares, etc., B.S.A. sidecar, hood, screen, luggage grid, as new; cost £107, accept £77/10.—Rex Mundy, 132, Gt. Portland St., W. [8526]

- B.S.A.**, 4 1/4h.p., 1915, 3-speed countershaft and kick start, motor cycle and sidecar, fitted with their highest grade coachbuilt sidecar, Lucas lamp and horn, complete with tools and all accessories; £65.—Wauchope's, 9, Shoe Lane, London. [X8823]

- B.S.A.**, 1915 model H, 4 1/4h.p., Millfords coachbuilt sidecar (both as new), all accessories, 3 Lucas lamps, Lucas horn, mechanical horn, speedometer, clock, knee-grips, etc., including A.O.U. badge and insurance policy, new; £80.—Grime, 6, Astley St., Dukinfield. [X8676]

- B.S.A.**, 1916 model, ridden only 700 miles, 4 1/4h.p., all chain drive, 3-speed, and clutch, electric lighting, speedometer, carrier seat, back-rest, Palmer cord tyres, overalls, etc.; cost over £75, accept £65 the lot; owner bought car.—Surgery, 11, Greens End, Woolwich. 'Phone: Woolwich 30. [8343]

- B.S.A.** 1916 Models in stock, all black finish; 4 1/4h.p., 3-speed countershaft gear, clutch, and kick-starter, chain and belt drive, model K, £62; all-chain drive, model H, £64; B.S.A. sidecars to fit; liberal exchange or extended payment terms.—Elce and Co., 16, Bishopsgate Av., Camomile St., E.C. [0481]

- B.S.A.** 1916 Models from stock; inspection cordially invited. All chain drive £64, chain-cum-belt transmission £62, fitted with B.S.A. countershaft gear, free engine, and kick start; B.S.A. sidecars to fit, £16; gradual payments entertained; second-hand machines taken in exchange; generous allowance; tuition and free delivery. Buy from B.S.A. appointed agents. 'Phone: Holborn 5777. When dealing with Wauchope's, purchasers can deal with confidence.—Wauchope's, 9, Shoe Lane, Fleet St., London (just off Ludgate Circus). [X8822]

## Calthorpe.

- 1915 1/2h.p. Calthorpe-Jap**, 2 1/2h.p., grand condition; £23. —Corporal Cohen, E.F.R.E., Landguard, Felixstowe. [8420]

- CALTHORPE-J.A.P.**, 2 1/2h.p., 2-speed, new, delivered October last; £36/10.—Sanders, Garage, Kidderminster. [X8682]

- CALTHORPE-J.A.P.**, 2 1/2h.p., 2-speed, Lucas lighting set, only a few months old; accept 25 gns.—Longman, 1, King St., Acton. [8510]

- CALTHORPE**, latest 2-speed J.A.P. and 2-stroke models in stock; cash or exchange.—Eagles and Co., High St., Acton, W. [X8914]

- CALTHORPE**, late 1915, 2-stroke, 2-speed, speedometer, and accessories; £26.—After 8 p.m., 33, Colville Rd., Leytonstone. [X8765]

- LATEST 1916 Calthorpes**, 2-speed models and single-speed machines, for delivery from stock.—Wauchope's, 9, Shoe Lane, London. [X8818]

- CALTHORPE Junior**, 2 speeds, tyres and everything as new, splendid hill-climber; £16/10, no offers.—103, Berners St., Loughs, Birmingham. [X8728]

- CALTHORPE-J.A.P.**, 1915 1/2, 2-speed, lamps, complete, almost new, unsratched; rare bargain, 27 gns.—32, Comeragh Rd., West Kensington. [8379]

- CALTHORPE-J.A.P.**, 2 1/2h.p., 2-speed Enfield gear; delivery from stock; £36/15; extended terms, £9/15 cash, 12 equal monthly payments of 45/- each.—Elce and Co., 16, Bishopsgate Av., Camomile St., E.C. [0607]

- CALTHORPES**, 1916 models, improved design, fitted with J.A.P. 2 1/2h.p. engine and Enfield 2-speed gear, £37/16; identically the same machine without 2-speed gear, £32/0/6; immediate delivery from stock; cash, exchange, or extended payments.—Wauchope's, 9, Shoe Lane, London. [X8821]

## Campion.

- CAMPION**, 1915, 2-stroke, lightweight, almost new, scarcely soiled; £22.—Percy and Co., 337, Euston Rd., London. [8399]

- 6h.p. Campion Combination**, J.A.P. engine, Jardine gears, chain drive, as new; £60.—Walter Guttridge, Barkby, near Leicester. [X8890]

- CAMPION**, 8h.p. J.A.P., coachbuilt sidecar, Jardine 2-speed countershaft gear, Roach mag.; £52.—312, Lichfield Rd., Aston, Birmingham. [X8895]

- 1915 4 1/4h.p. Campion-Precision**, 4-speed, sidecar, Lucas fittings, spares, done 2,000; cost £89. £65.—Walker, Jun., 37, Brigate, Leeds. [X8880]

- CAMPION-J.A.P.**, 1915, 6h.p. combination, Jardine 4-speed, chain and belt drive, new July, not done 2,000 miles, condition perfect; sacrifice £75.—13, Reservoir St., Leeds. [X8816]

## Centaur.

- CENTAUR**, 3 1/2h.p., 1913, 2 speeds, free engine, fine condition; £25/10.—Opl. Silman, Signals, Oatlands Park, Weybridge. [8313]

## Chater-Lea.

- 1915 2 1/2h.p. Chater-Lea**, 2-stroke, 2-speed; £30.—Thompson and Edwards, West Hartlepool. [X8924]

## MOTOR CYCLES FOR SALE.

## Chater-Lea.

CHATER-LEA, 3½ h.p., Bosch, spring forks, low, fast; £16, offers.—11, Brunshot Av., Churilton, S.E. [8421]

1915 Chater-Lea, 2-stroke, 2-speed, 400 miles, guaranteed, all accessories; £31; owner called up.—Strincer, 39, Grove Green Rd., Leytonstone. Tel.: East 3945. [8456]

CHATER-LEA, 3 h.p., Fafair, B. and B., Hellesen ignition, unpunctured tyres, new belt, just done up, good running order; £15. Call Saturday afternoon or Sunday next.—W., 110, Highbury New Park, N. [8393]

## Chater-Jap.

SECOND-HAND 3½ h.p. Jap-Chater-Lea Sidecar Combination, coachbuilt body, Armstrong 3-speed, in good running order; £24.—Seen at 248, Bishopsgate, London. [8482]

## Clement.

CLEMENT, 2 h.p., chain drive, B. and B., running order; £6, or offer.—Apply, after 6 p.m., Nash, 80, Rosslyn Hill, Hampstead. [8398]

## Clyno.

CLYNO, 1915, 3½ h.p., 2-stroke, mag., beautiful order; £25.—1, Ebner St., Wandsworth. [X8402]

6 h.p. Clyno, coachbuilt sidecar, screen, 2-speed countershaft, new gears, kick start, new tyres, recently overhauled and enamelled; £38/11; exchanges.—Millard, 1, Coleman Rd., Belvedere, Kent. [8350]

## Connaught.

CONNAUGHT, 3-speed model, good condition; price £28.—Doctor Templeton, Peel, Isle of Man. [8280]

CONNAUGHT, 2½ h.p., 2-stroke, 4 months old, guaranteed perfect, speedometer, etc., hardly used; £23/15.—155, Goldhawk Rd., Shepherd's Bush. [8381]

CONNAUGHT, 1916 models in stock; miniature 2-speed and 3-speed models, also sporting combination.—P. J. Evans, John Bright St., Birmingham. [8474]

## Douglas.

DOUGLAS, 2½ h.p., V, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½ h.p., U, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½ h.p., W, 3-speed, clutch, in stock; £56/14.

DOUGLAS, 2½ h.p., X, lady's, kick-start, in stock; £56/14.

DOUGLAS, 2½ h.p., War Office model, in stock; £54/12.

DOUGLAS, brand new, models U, V, W, and X, in stock, with C.A.V., mags., at rock-bottom nett cash prices; trade supplied promptly; lists on application. Douglas specialists. Tel.: 368. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [6864]

NEARLY New 1915 Douglas; £48.—A. J. Young, Newmarket. [8328]

DOUGLAS 1914½, 2½ h.p., 2-speed, T.T. bars; £38.—9, Salford Rd., Streatham. [8446]

DOUGLAS, 1915 racing type, mag., 2 speeds; £42/10.—1, Ebner St., Wandsworth. [X8404]

1910 Douglas, 2-speed, with lamp, horn, etc.; 17 gns.—Julian, Broad St., Reading. [X5539]

DOUGLAS, 2½ h.p., T.T., 2-speed, fast; £35.—West End Garage, Elgin St., Hereford. [X8927]

2½ h.p. Douglas, late 1914, 2-speed, clutch, kick 4 starter; £38.—80, Bisham Rd., Southport. [X8716]

DOUGLAS, 2½ h.p., 1914, 2-speed, clutch, kick, good order; £38.—6, Chatham Rd., Kingston-on-Thames. [8424]

DOUGLAS, 2½ h.p., 2 speeds, F.E., 1913, perfect condition; £32.—The Croft, Middleton Rd., Oldham. [X8731]

DOUGLAS 1915 T.T. Model, 2-speed gear, complete with accessories; £42/10.—Wanchope's, 9, Stone Lane, London. [X8919]

DOUGLAS, 1914, 2½ h.p., T.T., very little used; £35.—359, Wimbledon Park Rd. (2 minutes from Southfield Station). [8431]

DOUGLAS, 1912-13, splendid order throughout, lamps, horn, tools, etc.; bargain, £25.—Speechey, 45, Church Rd., Acton. [8518]

1914½ Douglas, 2-speed, clutch, good tyres, accessories, and spares; £37.—Gowland, Beckfield Lane, Acumb, York. [X8757]

DOUGLAS, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas.—Moffat, Yeovil. Tel.: 50. [9203]

DOUGLAS, 2½ h.p., model U, 1914 (November), mileage 1,200, new condition throughout; £38.—Box 1894, c/o The Motor Cycle. [X8931]

DOUGLAS.—Immediate delivery from stock; not agents only, but Douglas experts and specialists.—Gibb, Gough, Gloucester. [X3538]

DOUGLAS, 1914, T.T., 2 speeds, fully equipped, in exceptional condition; 40 gns.—Percy and Co., 137, Fenton Rd., London. [8407]

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ALLDAYS-ALLON, 2½ h.p., 2-speed	£42 0
ALLDAYS-ALLON, 2½ h.p., 2-speed and clutch	£45 0
SUN-VILLIERS, 2½ h.p., single-speed	£29 10
SUN-VILLIERS, 2½ h.p., 2-speed	£35 10
JAMES, 2½ h.p., 2-speed	£38 11
NEW RYDER, 2½ h.p., single-speed	£28 13
NEW RYDER, 2½ h.p., 2-sp. J.A.P.	£33 12
ZENITH, 4½ h.p., countershaft	£68 7
B.S.A., 4½ h.p., 3-sp., all chain	£64 0
B.S.A., 4½ h.p., ditto chain-cum-belt	£62 0
ALLDAYS-MITCHLESS, 2½ h.p.	£27 10
INDIAN, 5 h.p., 3 speeds, Model B	£70 0
INDIAN, 7 h.p., 3 speeds, Model C	£78 0
ENFIELD, 3 h.p., 2-speed, T.T.	£38 5
ENFIELD, 6 h.p., Combination	£89 5
LEVIS, 2 h.p., Popular model	£28 1
CALTHORPE, 10 h.p., coupe, dynamo light	

## 1915 MODELS

## AT REDUCED PRICES.

ROYAL RUBY, 2½ h.p., 2-str., 2-sp.	£36 10
ROYAL RUBY, 2½ h.p., ditto, single-sp	£29 10
ROYAL RUBY, 2½ h.p., J.A.P., single-sp	£32 10
ROYAL RUBY, 2½ h.p., J.A.P., 2-speed	£39 10
BLACKBURN, 3½ h.p., 3-sp. c'-shaft	£67 9
J.H., 4½ h.p., 3-speed M.A.G.	£67 0
J.H., 6 h.p., 3-speed, countershaft	£73 10
JAMES, 4½ h.p., 3-speed, Combination	£80 0

7½% cash discount on all above.

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## NOTE REDUCED PRICES.

REX, 1914, 8 h.p., Spacke engine, 3-speed	£48
REX, 1914, 6 h.p., hood and screen	£46
REX, 1914, 6 h.p., 3-speed, coach Sidecar	£50
ARIEL, 1914, 4 h.p., 3-sp., coach Sidecar	£42
TRIUMPH, 1911, 3½ h.p., clutch, and S'car	£22
MATCHLESS, 1914, 8½, M.A.G., 3 speeds	£75
ZENITH, 1913, 8 h.p., and sidecar chassis	£40
ZENITH, 1914, 8 h.p., clutch, Millford	£68
BAT, 1913, 6 h.p., 3 speeds and Sidecar	£52
V.S.-J.A.P., 1913, 8 h.p., 2-speed, Sidecar	£32
N.S.U., 1913, 6 h.p., 2 speeds, kick starter, Turner Sidecar, hood and screen, lamps, horn	£45

## SOLO MOUNTS.

REX, 1909, 3½ h.p., 3-speed, handle start	£21
ENFIELD, 2½ h.p., 1910, belt drive	£14
ENFIELD, 1915, 3 h.p., T.T., 2 speeds	£42
BLACKBURN, 1914, 3½ h.p., 3 speeds	£50
HUMBER, 1914, 2 h.p., 3-sp., open frame	£23
INDIAN, 1914, 7 h.p., T.T., clutch	£42
F.N., 1912, 2½ h.p., 2-sp., shaft drive	£17
ROVER, 1914, 3½ h.p., 3-speed, T.T.	£44
P. & M., 1914, 3½ h.p., 2 speeds, little used	£56
INDIAN, 1914, 7 h.p., electric equip., 2-sp.	£48
P. & M., 1913, 3½ h.p., 2-sp., handle start	£40
VELOCE, 1915, 2½ h.p., 2-sp., 2-stroke	£32
ZENITH, 1913, 3½ h.p., clutch	£38
DIAMOND, 1914, 2½ h.p., 2 speeds	£30
CALTHORPE, 1914, 2 h.p., 2 speeds	£19
ALLDAYS-ALLON, 1915, 2-str., 2-speed	£34
SUNBEAM, 1914, 3½ h.p., 3-speed	£58
DOUGLAS, 1914, 2½ h.p., T.T., Lucas lamps, horn	£40
CALTHORPE-J.A.P., 1915, 2½ h.p., 2-sp.	£29
KERRY-ABINGDON, 1910, 3½ h.p., 2 sp.	£22

## LIGHT CARS, &amp;c.

MORGAN, Grand Prix, 1913, special model, lamps, horn, windscreen	£90
VICTOR, 8 h.p., 1913, 2 speeds and reverse	£60
OVERLAND, 1916, Model 83, 5-seater, like new, all equipment	£225
CADILLAC, 1914, 20-30 h.p., 6 speeds, self-starter, etc., only done 6,000	£280

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## MOTOR CYCLES FOR SALE.

## Douglas.

1913 Douglas, 2-speed, Amac carburettor, well equipped, carefully used, tyres good; £30.—Pickup, 2, Albert Rd., Blackpool. [X8885]

1912½ Douglas, 2-speed, clutch, footboards, new pistons, valves, tyres (Palmer cord), accessories; £30.—Blades, Burtsett, Hawes. [X8723]

1912 Douglas, 2-speed, free engine clutch, Stewart speedometer, lamp, horn, tools, just overhauled; £25.—Frank Parsons, Meophia, Kent. [X8705]

DOUGLAS, 1915, T.T. model, 2 lamps, horn, etc., perfect condition, and very fast; £42.—The Sussex Cyclecar Co., Grand Parade, Brighton. [8282]

1915 Douglas, 3-speed, free engine, model W, and Watsonian wicker torpedo sidecar, all accessories; £50.—101, Lothair Rd., Harrogate, N. [8278]

1914 Douglas, 2½ h.p., 2-speed, Colonial, re-enamelled and overhauled, condition as new, week-ends only; £40.—Schoolhouse, Battlesbridge, Essex. [8467]

1911 Douglas, just been re-enamelled, and engine re-bushed, also new gudgeon pins, in perfect order; £16/10.—Bould, Bridge St., Congleton. [X8724]

1914 2½ h.p. 2-speed Douglas, excellent order, lamps, new generator, new tyre and tube, tools; £39, or near offer.—E. Chance, Lunden, Malvern. [X8811]

DOUGLAS, model U, £50/8, actually in stock; also 1913 2-speed, kick starter, 35 gns.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8336]

DOUGLAS, Douglas, Douglas.—Write us your requirements. We can supply all latest models to be had.—Alexander's, Scottish wholesale and retail agents, 115, Lothian Rd., Edinburgh. [8254]

DOUGLAS, 2½ h.p., 2-speed, T.T., 1914½, perfect condition, lamps and accessories; exchange sidecar combination, cash adjustment, or sell £40; any trial.—Day, R.M.A., Woolwich. [X8690]

1914½ 2½ h.p. T.T. Douglas, splendid condition, engine just overhauled, mags as new, P. and H. and tail light, long exhaust; bargain, £37.—“Morningside,” Leckhampton Rd., Cheltenham. [8412]

DOUGLAS 4 h.p. Combination, disc wheels, enamelled royal purple, coachbuilt sidecar, underslung, F.R.S. Major lamp, horn, rear light, just overhauled, tyres perfect; 51 gns.—Heathurst, The Vale, Hampstead. [8510]

DOUGLAS, 1913½, T.T., 2-speed, adjustable pulley, long exhaust, large Miller front lamp, Lucas rear light, Veder, new tool outfit and spares, in good condition; £30; owner in array; seen after 5 p.m.—3, Avenue Rd., Anerley, S.E. [8432]

1914 Douglas, clutch model, 3-speed gear, kick starter, in thorough going order, fastest machine on road; owner being called up to colours; only wants speed call with cash; no letters; bargain, £32/10.—Alfred Symons, 75, High Rd., Wood Green, N. [8297]

DOUGLAS Mode U, £50/8; Douglas Model V, £50/8; War Office Model, £54/12; Douglas Model W, £56/14; Douglas Model X, £56/14.—Above models actually in stock at Sole Wholesale and Retail Midland Distributing Agents, Colmore Depot, 31, Colmore Row, Birmingham. [X2344]

## Emblem.

AMERICA'S Latest Introduction into this country.—Emblem motor cycle. 4 models, 14 h.p. twin, 12 h.p. twin, 7 h.p. lightweight twin, 7 h.p. single. Agents, these will interest you.—Apply, 896, Fulham Rd., Wey. [8496]

## Enfield.

ENFIELD, 1915, 3 h.p., 2-speed, all accessories; 40 gns.; splendid condition.—E. Chapman, 7, Castle St., Worcester. [8301]

ENFIELD, 2-stroke, property officer abroad, mileage 300, Enfield 2-speed gear, clutch, enamel perfect; 33 gns.—Heathurst, The Vale, Hampstead. [8309]

1915 Royal Enfield Combination, hood, screen, etc., good as new; £58, bargain; seen any time.—29, St. Leonards St., Bow, near Bow Bridge. [8357]

6 h.p. Enfield Combination, latest model, practically new, speedometer, lamps, etc.; £75.—Morgan, 24, Glyn Mausons, Addison Bridge, Kensington. [8254]

1915 Enfield, 3 h.p., like new, not done 500 miles, lamp, horn, tools, perfect; £45, nearest offer.—Lt. Simpson, Kenworthy's Hydro, Southport. [X8721]

1915 Enfield, 3 h.p., 2-speed, model 140, new, but slightly shop-soiled; list price £52/10, going at £43.—Alexander's, 115, Lothian Rd., Edinburgh. [8255]

1912 6 h.p. Enfield, special wide coachbuilt sidecar to seat 2, accessories, etc.; £45, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [7022]

ENFIELD 3 h.p. Twin, 1914, 2-speed, kick starter, fully equipped, and in new condition, total mileage 1,000; accept £33.—Longman, 1, King St., Acton. [8509]

ENFIELD, 2½ h.p., 1912, 2-speed, P. and H. head lamp, and Lucas rear, new piston in front cylinder, unused one year, condition good; £20.—Fox, Wodehouse Place, Falmouth. [X8702]

1915-1916 6 h.p. Enfield Combination, lamp, generator, and horn, only used 3 times, bought in November, costing £92, would pass for new; owner enlisted; £74.—Alexander and Co., 115, Lothian Rd., Edinburgh. [8255]

## MOTOR CYCLES FOR SALE.

## Levis.

**LEVIS**, 1915, Popular model, lamp, horn, tools, hardly ridden, good condition; cost over £30; can be seen by appointment.—All offers by January 17th to Arras and Richards, Auctioneers and Valuers, 21 and 22, Market Place, Reading. [8285]

**LEVIS**, No. 1's £36/17. Populars £28/1, also the new Popular £32, and new No. 1 with Enfield 2-speed gear £47/10; actually in stock; generous deferred payments, liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8352]

**1915 Levis**, 2½ h.p. Popular model, new last June, ridden only 3,000, fitted Smith speedometer, Lucas lamp and generator, new belt, back Dunlop tyre, horn, etc., perfect condition; owner giving up riding; accept £25, as fitted; can be seen between 10 a.m. and 4 p.m.—Vince, 28, Chapstow Mews, Chapstow Place, Westbourne Grove. [8311]

## Lurquin-Coudert.

**1912 6h.p. Lurquin-Coudert**, sidecar, 2-speed, new tyres throughout, in good order; no reasonable offer refused.—Frazier, 106, Barkworth Rd., South Bermondsey, S.E. [8457]

## Martin.

**MARTIN-J.A.P.**, latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.C. Tel.: Regent 1432. [0760]

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**MATCHLESS**, 1912, and sidecar, good order, lamps, horns, and tools; £38-50, Clapham Rd., S.W. [8499]

**1913 7h.p. Matchless**, Canoelet sidecar, all accessories, £55, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cudiff. [0721]

**2½ h.p. Matchless Lightweight**, 4-stroke, mag., smart little machine, perfect throughout, spare tyre and tube new; £16.—Fountain, Scartho, Grimsby. [8290]

**1915½ Matchless Combination**, with Lucas dynamo lighting set, fully equipped; cost £115; owner enlisted—accept £88.—Hughes, 66, Raby St., Moss Side, Manchester. [X8710]

## Monopole.

**MONOPOLE**, clutch model, 2½ h.p. Precision engine, good condition, P. and H. lamps, and accessories; £21, nearest offer.—C.B., 26, Campsbourne Gardens, Hornsey, N. [8388]

## Moto-Reve.

**MOTO-REVE**, 2h.p., mag., Druid, going order; £5.—E. Wilson, 6, Park Rd., Farnham, Surrey. [8451]

**MOTO-REVE** Twin Lightweight, mag., Druids; seen running; £8/10.—A. Speechley, 45, Church Rd., Acton. [8520]

**MOTO-REVE** Twin Cycle, complete, less unit, £47/16; Villiers free engine back wheel, £21/19/6; wanted a lightweight carburettor.—Batts, Cycle Maker Sheffield, Walsall. [8274]

## Motococche.

**MOTOSACOCHE**, 1914, 3½ h.p. twin, 2-speed countershaft, engine as new; accept best offer.—A. Coffin, Holwell Sherborne. [8263]

## New Hudson.

**1915 New Hudson Big Six** Combination, countershaft gear, complete lamps, and horn; £62.—Lawrence, Lichfield Rd., Bloxwich. [X8876]

**NEW Hudson**, 1914, 3½ h.p. J.A.P., T.T. special, fast machine, in perfect order; £21.—Percy and Co., 337, Euston Rd., London. [8411]

**NEW Hudson**, 1914, 4 h.p., and coachbuilt sidecar 3 speeds, free engine, clutch, and kick starter; Lucas lamp, horn, many spares; £45.—Rexstrew, 20, Holmewood Rd., South Norwood, S.E. [8352]

**1915 2½ h.p. New Hudson**, with new heavy Dunlop back tyre, in very good condition, and splendid running order; 23 gns. great bargain.—Julian, Central Garage, Broad St., Reading. Phone: 1024. [X8328]

**NEW Hudson** and sidecar, 1915 model, very fully equipped with speedometer, horn, lamps, tools, etc., not run 2,000 miles in perfect condition; £60.—The Sussex Cyclecar Co., Grand Parade, Brighton. [8281]

**NEW Hudson Big Six**, luxurious combination, £92/8; 4 h.p. combination, £78/15; model C, 2-stroke, £38; generous deferred terms, liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8353]

**6 h.p. 1915 Twin-cyl. 3-speed and Free Engine** New Hudson and coachbuilt sidecar, very silent running machine, carries out guarantee of fitness; any severe trial given, complete with all accessories; £60.—Wanchope's, 9, Shoe Lane, London. [X8824]

## New Imperial.

**1916 New Imperial** in stock, 35 gns.—Cross, Arent, Rotherham. [X8852]

**NEW Imperial-Jap**, 1916 models, in stock, from £36/15.—Crow Bros., 190, High St., Guildford. [8413]

**NEW Imperial**, light tourist, immediate delivery; cash or easy terms.—Referee Cycle Co., 332, High Holborn. [0765]

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## MOTOR CYCLES FOR SALE.

## New Imperial.

**1915 New Imperial**, 2½ h.p., 2-speed, splendid condition; £26.—Jones, 16, Bourneville Terrace, Tredegar. [X8747]

**NEW Imperial-Jap**, 1915, 2½ h.p., 2-speed, shop-soiled; 30 gns.—Julian, Broad St., Reading. Phone: 1024. [X6408]

**NEW Imperials**, delivery 1916 models from stock; prices from 35 gns.—P. J. Evans, John Bright St., Birmingham. [8476]

**NEW Imperial-Jap**, 1915 (June), 2½ h.p., 2-speed, lamps, spares, tyres new, mileage 2,000; £23.—Allen, 50, Vera Rd., Fulham. [8314]

**1914 New Imperial**, 2-speed, variable ignition, engine overhauled by makers, complete; £25.—D. C. Lamb, 151, High St., Walthamstow. [8348]

**NEW Imperials**, 1916 models, in stock; sole London agents; trade supplied; few 1915 shop-soiled at reduced prices.—A. P. Rey, 173, Gt. Portland St., London, W. [7832]

**2½ h.p. New Imperial-Japs**, latest models, just delivered, 2-speed and free engine, an ideal lightweight; £36/15; cash, extended payments, or exchange.—Wanchope's, 9, Shoe Lane, London. [X8833]

## New Ryder.

**1914 New Ryder**, 2-stroke, 2½ h.p. Villiers engine, 2 speeds, complete, good condition; cost £36, accept £22.—4, Talbot St., Burnley. [X8814]

## Norton.

**NORTONS**, 1916 models in stock; Brooklands road special, T.T. model, sporting countershaft, and De Luxe combinations.—P. J. Evans, John Bright St., Birmingham. [8472]

## N.S.U.

**N.S.U.**, 3½ h.p., wicker sidecar, 2-speed, F.E., mag. ignition; sacrifice £14/10.—45, Church Rd., Acton. [8519]

**N.S.U. Motor Cycle and Sidecar**, modern 6h.p., twin-cyl., 2-speed, F.E., perfect condition; £54.—View, etc., H.T.L., 2, Clarence Rd., Brondesbury, N.W. [8068]

**5½ h.p. Twin N.S.U.**, sidecar, B. and B., waterproof Bosch, perfect throughout, will average 20 comfortably; £20; appointment.—8, Thornton Av., Brixton. [8344]

## N.U.T.

**1914 T.T. 3½ h.p. Twin N.U.T.**, 3-speed, complete with following accessories—Lucas head and tail lamps, horn, tool kit, 2 spare pairs of handle-bars, rear wheel for racing purposes, etc., in first-class condition, and little ridden; property of officer now serving abroad; price £40.—Sellers, Devonshire Works, Keighley. [8286]

## O.K.

**O.K.**, model 3, 2-speed, clutch model, soiled only; £32/10.—Sanders, Garage, Kidderminster. [X8684]

**1914 O.K. Junior**, 2-speed, new tyres and belt; £19.—Hindle, 99, Princess Rd., Moss Side, Manchester. [8429]

**O.K.**, 1915, new condition, 2h.p., 2-speed; seen any time—accept £26.—Cpl. Welch, Signals, Oatlands Park, Weybridge. [8312]

**O.K.**, 2-stroke, 1915, faultless, Senspray, lamps, tool-bag, generator, horn; £23.—Soldier, 13, Roseway, Well Hall, London. [8713]

**1914 O.K. Junior**, 2½ h.p., 2-speed, m.o.v., fine condition, been overhauled; £22.—22, Arcadian Gardens, Bowes Park, N. [X8872]

**O.K. Junior**, Nov., 1915, lamps, horns, etc.; bargain, £27, want higher power.—Hollingsworth, N. Haw Rd., Addlestone, Surrey. [8466]

**O.K. Junior**, 1915, 2-speed, in splendid condition, very little used; original price £33/10, to be cleared at 21 gns., very great bargain.—Julian, Broad St., Reading. Phone: 1024. [X2346]

## P. and M.

**1913 P. and M.**, complete, Lucas lamps, etc., in fine order; £40.—Cross, Jeweller, Rotherham. [X8854]

**1913 3½ h.p. P. and M.**, perfect condition; any trial; £35; 2-speed.—39, Belmont Park Rd., Leyton. [8464]

**1913 P. and M.**, 3½ h.p., good condition, fast, powerful, all accessories, spares, etc.; £40, or offers.—Harrison, 1, Byron Rd., Sheffield. [X8727]

## Peugeot.

**PEUGEOT** 6h.p. Twin Combination, Bosch, Amac, 2½ in. tyres, spares, accessories, very low; trial; £30.—Niton Villa, Hornchurch Rd., Romford. [8262]

## Precision.

**PRECISION-TYLER**, 2½ h.p., 2-speed, 5 months old, unsprayed, lamp, generator; bargain, £22/10.—18, South Bruton Mews, Bond St., W. [8543]

**PRECISION**, 2½ h.p., just been overhauled by manufacturers, T.T. bars, and accessories; £19, bargain.—Leighton's, opp. Wood Green Station. Phone: Palmer's Green 471. [8532]

## Premier.

**NEARLY New C.S. 2-speed Premier**, Lucas lamp and horn; £42.—A. J. Young, Newmarket. [8325]

**PREMIER** and Sidecar, 2-speed gear, usual accessories; bargain, £26.—Bunting, Harrow. [8416b]



## MOTOR CYCLES FOR SALE.

## Premier.

31 h.p. Premier, 3 speeds, as good as new; £30, with 32 P.H. lamp and horn.—The Garage, Whitland, S. Wales. [X86149]

1912 3½ h.p. 3-speed Premier, speedometer, and all accessories; £27/10.—Barrett, 10, Stockwell Park Rd., Clapham, S.W. [X8892]

PREMIER, 1914½, 3½ h.p., countershaft 3 speeds, with sidcar, lamps, speedometer, condition perfect; £45.—H. Margrie, 165, Mackintosh Place, Cardiff. [X8879]

1913 3½ h.p. Premier, 2-speed, countershaft, free engine, speedometer, and wicker sidcar, splendid condition; £38.—Tuncell, 37, Castletown Rd., Stamford Hill. [X8505]

31 h.p. Premier and coachbuilt sidcar (Oct., 1914), 3-speed, kick start, seldom used, and practically new; bargain, £45, with accessories.—Ireland, 18, Nadine St., Seedley, Manchester. [X8768]

1915 Premier, 3½ h.p., 3-speed countershaft, Mills-Fulford coachbuilt sidcar, all accessories, only done 400 miles, all practically new; must sell; £55.—A. G. Margetts, Grocer, Birstall, Leeds. [X8616]

PREMIER, 1915, 3½ h.p., special military model, all black, 3-speed countershaft gear, kick-starter, handle-bar clutch, practically new, guaranteed; £48.—Elce and Co., Bishopsgate Av., Camomile St., E.C. [0552]

1914 (Oct.) 7-9 h.p. Premier, 2-speed, Gloria coach sidcar, large luggage well, spare can holder, lamps, tools, speedometer, spare tyre, belt, etc., overhauled by makers last July, very powerful; any examination; 60 gas.—Capt. King, 156, Westbourne Grove, Bayswater. [X8585]

## Quadrant.

31 h.p. Quadrant, fitted with variable gear, sound condition; £20; guaranteed.—Wanchope's, 9, Shoe Lane, London. [X8834]

QUADRANT, 3½ h.p., 2-speed, new tyre, tube, belt, all accessories, splendid order; bargain, £25.—Lonsdale, 13, Ada St., Darlington. [X8887]

41 h.p. 1915 Chain-drive Quadrant, 3-speed countershaft, excellent condition, little used, lamp, horn, tools; £50.—Howard, Cole St., Scunthorpe. [X817]

41 h.p. Quadrants, latest new 1916 models, chain-cum-belt transmission, B.S.A. 3-speed gear, free engine, and kick start; delivery from stock; price £60; exchange or easy terms.—Wanchope's, 9, Shoe Lane, London. [X8835]

## Radco.

RADCO, 1914, 2½ h.p., 2-stroke, splendid running; bargain, £14/10.—155, Goldhawk Rd., Shepherd's Bush. [X8380]

## Rex.

31 h.p. Rex, mag., good running order; bargain, £8/15, 41, Ashford Rd., Cricklewood. [X8495]

6 h.p. Rex Combination, 1913, splendid condition; £40.—Odell, Cate Royal, Biggleswade. [X8428]

32 h.p. Rex, good tyres and belt, coil ignition; bargain, £6/10.—Box 9,889, c/o The Motor Cycle. [X8878]

1909 Rex, mag., tyres, belt good, free engine; £9/15.—Thompson and Edwards, West Hartlepool. [X8922]

1914½ Rex de Luxe, 6 h.p., and sidcar, little used, as new; cost £84, 50 gas.—Delahay, Callington, Cornwall. [X8898]

REX 7 h.p. Combination, hood, speedometer, Bosch, B. and B., accessories, tools; £30.—17, Lesbia Rd., Clapton, N.E. [X8850]

REX, 1912, Ch.p., 2 speeds, Philipson pulley, 30 lamps, sidcar, nearly new tyres; £25.—Plummers, Baker St., Enfield. [X8277]

5 h.p. Twin Rex, mag., clutch, art case underslung sidcar, good order; £14, offers; exchange solo mount.—31, Shaw St., Bury, Lancs. [X8756]

31 h.p. Rex, mag., Mabon clutch, free engine, with 32 smart canoe wicker sidcar, spare tube and sundries; £20, complete.—Fountain, Scartho, Grimsby. [X8292]

1910 Rex 3½ h.p., variable pulley, with basket sidcar, all in good order, carefully kept, lamp, horn, and spares; £20.—Apply, W. Aitken, 157, Bo'ness Rd., Grangemouth. [X8354]

6 h.p. Twin Rex Combination, motor cycle and sidcar, done about 5,000 miles, in perfect condition throughout, all accessories, 2-speed, with clutch, tyres all in good condition; £50, or near offer. Oakley, Ltd., 65, Regency St., London, S.W. [0755]

## Riley.

9 h.p. Twin Riley, w.c., mag., carburettor, radiator; £18.—80, Biaphan Rd., Southport. [X8717]

## Rover.

ROVER, 2½ h.p., mag., good condition, low; £9.—35, Queen's Rd., Monkseaton. (1) [X8933]

32 h.p. Rover Combination, 1913, 3 speeds, almost new, £38; another at £28.—Percy and Co., 337, Euston Rd., London. [X8404]

ROVER, 1916 models in stock; immediate delivery. T.T. models, with or without Philipson.—P. J. Evans, John Bright St., Birmingham. [X8473]

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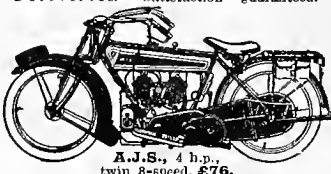
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## MOTOR CYCLES FOR SALE.

## Rover.

ROVER, 1913½, 3-speed, Lucas lamp, tools, perfect order; £38, exchange Indian or powerful twin.—Haddfield, 85, Uxbridge St., Barton-on-Trent. [X8303]

1914 3½ h.p. Rover, 3-speed Sturmeys-Archer, Duallops, Brooks's saddle, Bosch mag., with Mills-Fulford coachbuilt sidcar, under 1,000 miles, everything guaranteed; £48.—Robinson's Garage, Green St., Cambridge. [0613]

## Royal Ruby.

ROYAL Ruby, 1915, 2-stroke, 2-speed, in new condition; £24.—Percy and Co., 337, Euston Rd., London. [X8406]

ROYAL Ruby, 1915, 2½ h.p., J.A.P., 3 speeds, clutch, aluminium footboards, accessories, practically brand new machine; £35.—Adelaide Motor Co., 84, Chaik Farm Rd., N.W. [X8436]

## Rudge.

1914 5-6 h.p. Rudge Multi, coach combination, fine condition; £39/10.—Stocks, Thurstone, Penistone. [X8800]

1914 5-6 h.p. Rudge Multi and Swan sidcar, Miller lamp; £42, or near offer; fine condition.—The Garage, Whitland, S. Wales. [X6148]

1913 T.T. Rudge Multi, new tyres, lamp, horn, excellent condition; officer under orders; £30.—Green, Headquarters Mess, New Camp, Grantham. [X8525]

1912 Rudge, 3½ h.p., single speed, new Cliecher tyres; £21/10, exchange with coach for Ford 4-seater, about 1915.—270, Mount Pleasant Rd., Tottenham. [X8522]

GREAT Bargain.—5-6 h.p. 1913 Rudge Multi, excellent order, lamp set, horn, etc.; £27, or exchange 2-stroke and cash.—Mason, Motors, Leichworth, Herts. [X8500]

RUDGE Multi, 1915, 3½ h.p., delivered August, condition perfect, complete accessories; owner enlisted; 39 gas., or near offer; cost £65.—123, Queen's Rd., Finsbury Park, N. [X8877]

RUDGE, 1915, I.O.M. model, 3-speed, hand clutch, new tyres, Lucas lamp set, mechanical horn, condition as new; £46.—Savage, 1, Fern Cottages, Reading Rd., Farnborough, Hants. [X8382]

FOR Sale, owing to absence at the Front, officer's 3½ h.p. racing Rudge—Apply, Mrs. Lea-Smith, Gothic Lodge, Wimbledon Common. Nearest offer £35 accepted. Perfect going order. [X8288]

RUDGE Multi, 1912, 3½ h.p., coachbuilt sidcar, engine parts, driving wheel, carburettor, and sidcar springs recently renewed, perfect running order; £32.—Hill, Osborne House, Earl Shilton, Hinckley. [X8312]

## Scott.

SCOTT, 1912, cane sidcar, 1915 lubrication, new spare tyre, lamp, all in good condition; £32.—Forster, Mersey St., Warrington. [X8174]

32 h.p. Scott, late 1914, practically new condition, small mileage, complete with lamps, horn, etc.; nearest £58.—Box L437, c/o The Motor Cycle. [X8346]

LATE 1914 Scott and Canoelet, beautiful, £49, or exchange for higher power, 1914 7-9 h.p. Indian and sidcar preferred (cash adjustment).—Whittle, Belle Vue Rd., Cinderford. [X8770]

32 h.p. Scott, 1915, and sidcar, perfect condition, very little used, hood, wind screen, tyres as new, speedometer, lamps, etc.; £60.—Lister-Kaye, Stoborough, Wareham. [X8918]

1912 (Dec.) 3½ h.p. Scott, automatic lubrication, only run 4,000, not used for year, fine condition, Lucas lamp set, and other accessories; £30; exchange lightweight.—L447, c/o The Motor Cycle. [X8504]

SCOTT, 1914, 3½ h.p., 2-speed, kick-starter, touring and T.T. bars, Lucas lamp set, Watford speedometer, Binks carburettor; special bargain, £39/10.—Elce and Co., 16, Bishopsgate Av., Camomile St., E.C. [0551]

ENGINEER-OWNED Scott Combination, 1914, 2-speed, sight-feed lubrication, Binks carburettor, speedometer, horn, lamps, spares, good condition; ask details; 45 gas. for quick sale.—Heythrop, Riverway, Palmer's Green. [X8361]

## Singer.

SINGER, 1913, F.E., 3½ h.p., in perfect order and condition; £21.—Percy and Co., 337, Euston Rd., London. [X8405]

31 h.p. Singer, mag., spring forks, footboards, h.b.c., good condition; ride 30 miles purchaser; £14, or £11 and push bike.—6, Ruekin Rd., Crewa. [X8430]

## Sheffield Minor.

SHEFFIELD Minors.—Immediate delivery of this exceptionally fine 2½ h.p. 2-stroke single-speed, 28 gns.; 2-speed, 35 gns., including 1916 improvements.—Colmore Depot, 31, Colmore Row, Birmingham. [X2340]

## Sun.

1915 Sun-Vitesse, 2½ h.p., 2-stroke, 2-speed, only done 300 miles; £28.—James Howieson, Hillhead, Auchengray, Carwarth. [X8691]

SUN-VILLIERS Motor Cycle, late 1914, 2-stroke, countershaft 2-speed gear, lamps, accessories, equal new; £25/10.—Davis, 35, Whittal St., Birmingham. [X8857]

## MOTOR CYCLES FOR SALE.

## Sun.

SUN-V.T.S., countershaft 2-speed, handle-bar clutch, with Watsonian light coach sidecar, cost £48 September, 1915, little used; £37/10, or exchange with cash to £40 for nearly new 4 or 6 h.p. twin combination.—Letters, W.H.P., 2, Ormsby St., Reading. [X8617]

## Sunbeam.

SUNBEAM, 1916.—New 3½ h.p. combination and T.T. models in stock.—Moss, Wem. [X8803]

1916 3½ h.p. Sunbeam, in the crate; first cheque secured, £73/10.—West End Garage, Eign St., Hereford. [X8861]

1916 Latest Models 8 h.p. and 3½ h.p. Sunbeams actually in stock; also Sunbeam cycles.—A. J. Young and Co., Ltd., Newmarket. [8529]

FOR Sale, 1915 3½ h.p., Sunbeam, T.T. model, with sporting Rally sidecar, best Lucas lamp, tail light, and hand-operating horn; £65.—Box 9,888, c/o The Motor Cycle. [X8869]

8 h.p. 1916 Sunbeam.—To those interested, we have taken delivery of the first 1916 model, which is being exhibited at our premises. Enquiries invited.—Robinson's Garage, Green St., Cambridge. [6867]

3½ h.p. New Sunbeam, latest model, countershaft 3-2 speed gear, and chain drive, still in crate, just as delivered from makers, price 70 gu.; also a magnificent second-hand 1915 Sunbeam, 3-speed countershaft model, and chain drive, fitted with speedometer, lamp, horn, and tools, etc.; £67/10 cash; extended payments or exchange.—Wanchope's, 9, Shoe Lane, London. [X8836]

## Swift.

3½ h.p. Swift, good, sound machine, running splendid; £20; guaranteed.—Wanchope's, 9, Shoe Lane, London. [X8837]

## Torpedo.

TORPEDO-J.A.P., 2½ h.p., 2-speed, in good running order; £17.—Seen at 248, Bishopsgate, London. [8481]

1913 4 h.p. Torpedo, new tyres, belt, etc., excellent condition throughout, guarantee given; cash needed; £18.—Box 9,890, c/o The Motor Cycle. [X8796]

## Triumph.

1913 Triumph, 3-speed; £38/10.—West End Garage, Eign St., Hereford. [X8862]

3½ h.p. Triumph, standard, Bosch, 2 lamps, horn; £12.—80, Bispham Rd., Southport. [X8715]

TRIUMPH, 1911, 3½ h.p., in perfect order; £17.—Percy and Co., 337, Euston Rd., London. [8400]

TRIUMPH, 1913, clutch model, Kempshalls, machine little used; £35.—24a, Earl's Court Gardens, S.W. [X8714]

TRIUMPH Spare Parts, no exceptions, all years in stock.—Robinson's Garage, Green St., Cambridge. [0612]

TRIUMPH, with Brampton variable gear, excellent order throughout; £25.—Bunting, Harrow. [8416a]

TRIUMPH, 1912, free engine, Kempshall, spares, excellent order; £23.—Noble, Wellington Rd., Ashford, Middlesex. [8289]

3½ h.p. Triumph, coil ignition, good condition throughout, cut, ride away; £29/10.—The Nest, Knowl Hill, Twyford, Berks. [8376]

TRIUMPH, 1913, 3½ h.p., 3-speed gear and clutch, overhauled, complete with accessories, guaranteed; £35.—Moss, Wem. [X8804]

TRIUMPH, 3½ h.p., 1912 engine, Philipson pulley and all accessories; £28/10.—Leighton's, opp. Wood Green Station. [8533]

TRIUMPH-J.A.P., 2½ h.p., very low, Palmers, U.H., perfect condition, cheap; exchange with cash for car.—Blunt, Briggs. [8360]

TRIUMPH, 1912, N.S.U. 2-speed, new belt and tyre, and Millford sidecar; bargain, £25.—Pike, 102a, Church St., Chelsea. [8318]

TRIUMPH, 1914, 3-speed, clutch, 14 gn. Millford coach sidecar, new condition; £25.—Mills, 14, Grove Rd., Wanstead. [8261]

1914 4 h.p. 3-speed semi T.T. Triumph, in exceptionally good condition; £42/10.—Lient, 3rd Essex Regt., Harwich. [8265]

TRIUMPH, 1911, 3½ h.p., adjustable tappets, P.E., T.T. bars, tyres, belt, as new; £22/10.—The Croft, Middleton Rd., Oldham. [X8730]

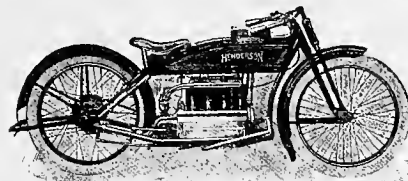
1911 Triumph, Philipson, hill-climb and speed trial winner, excellent condition; £28.—Moore, Westville, Riddlesden, Keighley. [8843]

SEVERAL very cheap Triumphs for sale.—Call or write, Morgan and Maxwell, The London Motor Mart, 80, High Rd., Streatham. [0765]

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1908 Triumph, 2 new tyres, mechanically good, pulls well; £15 cash, genuine bargain.—P. Riddelsell, Boxford, Suffolk. [8597]

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TRIUMPH, splendid condition, 3½ h.p., 2 speeds, about 1,911, new cover and belt; £18, quick sale wanted.—76, Summerley St., Earlsfield, S.W. [8493]

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TRIUMPH, 3-speed, with Montgomery sporting model sidecar and accessories, perfect condition; £48/10, cost £80.—Garner, Oldacre, Brocton, Stafford. [X8720]

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1913 3½ h.p. 3-speed Triumph, with Canoelet coach-built sidecar; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0734]

TRIUMPH, 1914, 3,000 miles, 4 h.p., 3-speed, Phelon and Moore coach sidecar, spare cover and tube; £49.—McGlashan, 11, Egerton Rd., Greenwich, S.E. [8443]

TRIUMPH, 1914, 4 h.p., 3-speed Sturmeys, Bramble coach sidecar, speedometer, perfect condition; £42.—Seen Stag Motor Works, East Finchley, London. [8488]

1912 Triumph, N.S.U. 2-speed gear, clutch, good tyres, speedometer, 2 lamps, horn, tools, wicker sidecar, reliable; bargain, £30.—Culley, 16, Musters Rd., Nottingham. [X8891]

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TRIUMPH 1909 cylinder and piston, complete with valves, £2; 1910 Triumph piston, complete, 10/—Amac carburettor, 6/6.—Young, 47, Cooksey Rd., Small Heath, Birmingham. [X8750]

TRIUMPH, 1913, 3-speed Sturmeys-Archer gear, and cane canoe sidecar, lamps, horn, and all spares, all in good condition; £36/10.—Clark, 5, Gordon Terrace, Stockton-on-Tees. [8351]

1913 3-speed Triumph, with brand new 17 gn. Gloria sidecar, luggage rail, all accessories, perfect; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0720]

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TRIUMPH, 1914, 3-speed, in excellent order, £49/10; and 1913 3-speed, £41/10; generous deferred payments, liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8337]

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TRIUMPH, 1911, clutch model, thoroughly overhauled by makers only, 70 miles since, with new wicker sidecar; £30, or near for quick sale; genuine.—Wright, 108, Plymouth Place, Leamington. [X8932]

TRIUMPH, 1914, T.T. roadster, clutch, Nirona lamp, Lucas horn, engine and tyres in excellent condition; £40, or nearest offer; owner going on service.—Capt. Cooper, 23rd Manchesters, Parkhouse, Salisbury. [X8621]

1913 3½ h.p. T.T. Triumph, clutch model, overhauled by makers in 1914, like new, P. and H. head lamp, good belt, tyre, and accessories; £33; exchange entertained.—Apply, L. Yarde, 7, Kimbolton Av., Bedford. [X8676]

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1915 Velocette, new condition, only ridden 100 miles; cost £40; 2-speed, chain drive; accept £28, bargain.—Lawton, 66, Raby St., Moss Side, Manchester. [X8711]

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1911 6h.p. Viudec, 2-speed, sidecar, fast, reliable; £18, or separate.—Hurlock, 2, The Promenade, Mill Hill, Middlesex. [8267]

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WHITE and Poppe, 4h.p., in splendid tune, mag.; bargain, £9/10.—Bunting, Harrow. [8416]

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WOLF, 25h.p., 1916 model, just delivered, 2-speed, 2-stroke, kick starter, hand-controlled clutch; £56/19/6; exchanges or deferred payments.—Eagles and Co., High St., Acton, W. [X8915]

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WOLF 1916 Models in Stock.—2 1/2 h.p. 2-stroke, 2-speed countershaft gear, hand-operated clutch, kick starter; marvellous value for money; £36/19/6 cash, or extended terms.—Elice and Co., 16, Bishopsgate Av., Camomile St., E.C. [0599]

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LEVIS, 2 1/2 h.p., free engine, h.b.c., kick starter, just thoroughly overhauled by makers, guaranteed perfect; cost £42, sacrifice £25, a rare bargain.—Roulter 10 till 8, at 108, City Rd., E.C. [X8899]

LITTLE Giant, 1915 lady's model, 2-speed, only ridden few miles, climb any hill, P.H. Projector set, horn, all accessories, lot as new; £22 gns., near offer.—Chapman, 50, High St., Strood, Kent. [8438]

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2 CYL. 4 1/2 h.p., new mag., low and fast; £7, or exchange for 3 1/2 h.p. single.—26, Elmhurst Rd., Forest Gate, E. [8287]



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TRIUMPH, 1912, 3 1/2 h.p., clutch model. . . . . 330

TRIUMPH, 1913, 3 1/2 h.p., clutch model. . . . . 334

TRIUMPH, 1914, 3 1/2 h.p., T.T. roadster, Cowey speedometer, Lucas head lamp and horn. . . . . 338

TRIUMPH, 1914, 4 h.p., 3-speed model, head lamp, horn, and back lamp. . . . . 346

TRIUMPH, 1914, 4 h.p., 3-speed, lamps and horn, and Gloria Sidecar. . . . . 356

B.S.A., 1913, 4 1/2 h.p., 3 speeds, chain drive, Lucas dynamo lighting set, and de Luxe Sidecar, upholstered in Bedford cord. . . . . 375

MATCHLESS, 1914, 4 h.p., twin, 3 speeds, and Gloria Sidecar. . . . . 350

BRADBURY, 1912, 3 1/2 h.p., 2-speed gear, head lamp, back lamp, horn, and speedometer. . . . . 327

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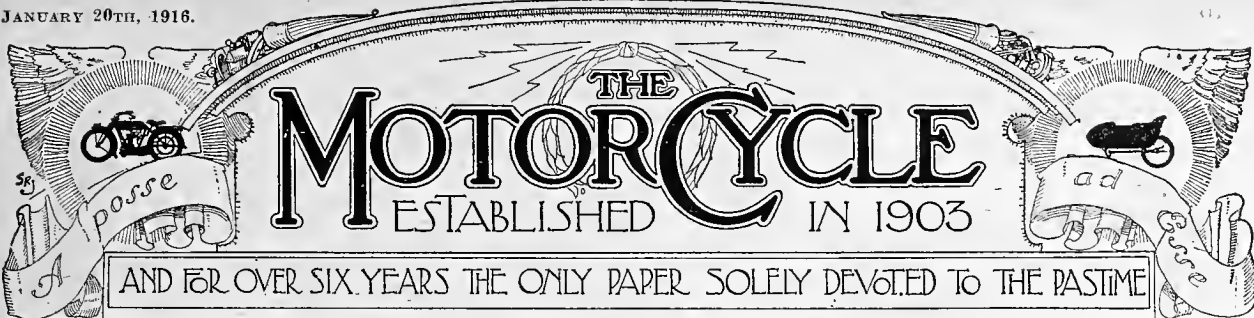
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## The Importance of Exports.

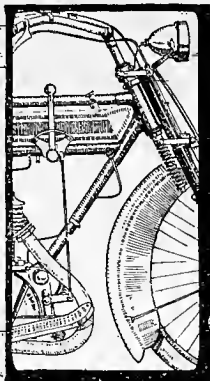
**I**T is a fact, strange but true, that we have met with instances on several occasions of late where British manufacturers are not encouraged to send their motor cycles abroad. That the difficulties which are placed in the way of manufacturers are generally known, we are inclined to disbelieve, particularly as the ordinary observer is educated to suppose that our Government is doing its utmost to encourage exporters to send wares abroad, and so bring into this country the much needed gold in order to maintain our balance of trade. Probably there is a flaw in the organisation not yet discovered, and we do not need reminding of the scarcity of overseas transport. On the one hand, we have the Board of Trade exhorting manufacturers to specialise on the requirements of countries overseas. We further find the question of products for overseas trade put up as an important consideration to excuse a man from military service; yet, boiled down, when our manufacturers try to, and do indeed, fall in with Government plans by producing motor cycles with the firm intention of sending them abroad, they encounter all sorts of unsuspected obstacles.

Some of our leading firms could dispose of more than their whole output abroad were they encouraged to do so, and indeed one firm we know has been patriotic enough to go out of its way to suggest such a course to the Government. Whilst one would imagine that such an offer, which is entirely in conformity with Government overtures, would be immediately seized upon, there is no such enthusiasm displayed. From the national point of view, in order to create an offset against our huge imports, it seems the obvious course to export the whole, or, at any rate, the larger part of the country's output.



## A New Design of Two-stroke Engine.

An Attempt to Cure Four-stroking and Provide a Variable Compression.



**T**HE present clouded position of the two-stroke engine is one which every new and popular piece of motor mechanism has to undergo before it attains full and merited justice. It arises from the fact that many manufacturers are mere copyists, and whenever a new idea seems likely to become popular a great number of makers blindly follow the lead and rush on to the market copies, which sometimes are fairly well up to the original in general design and workmanship, but lacking the essential points which have given the original its leadership.

Not that the two-stroke engine is a new idea by any means, for one of the earliest petrol engines was a two-stroke invented by a Mr. Day. I am not quite certain, but to him, I think, lies the credit of the three-port system. If we except the few spasmodic attempts, the honour of bringing the two-stroke engine into prominence in the motor cycle world belongs to the Scott. This make still stands in a class by itself by reason of its fine design and clever features.

As long as makers confined their efforts to engines with bores of 70 mm. and under, the inherent faults of this system did not expose themselves unduly, and, if one excepted the heavy consumption of fuel and lubricant, one had a fairly satisfactory mount. However, recent developments in bigger and multi-cylindered engines have again brought these failings into prominence, and have disheartened many designers, so much so, that these men have turned to the four-stroke engines for the solution of providing a quiet and efficient motor cycle engine.

### Simplicity an Enemy.

It is strange that, although the two-stroke has been on the market for some years, the general design has not altered one iota. It may seem a paradox, but simplicity has been the two-stroke engine's greatest enemy; it is this apparent simplicity which has kept most manufacturers from venturing into new fields. After all, simplicity is only a comparative term, and if certain parts are essential for the satisfactory working of an engine, it is not good policy to discard these parts and leave a crude, unfinished article.

At present the two-stroke engine has three great faults:

- (1.) Its coarseness in running. By coarseness I mean its lack of flexibility.
- (2.) Its tendency to four-stroke, and sometimes six-stroke.
- (3.) Its heavy consumption in fuel and oil, causing the engine to get into a very dirty state in a short time.

Now these faults have been there all along, and although manufacturers have their own pet ideas, yet the broad fact remains that the only additional refinement in use is the compression release valve, which after all only acts as an exhaust valve lifter.

These three faults are all inter-connected with each other, and to get at them we must reason out exactly what happens in a two-stroke engine, say with crank case compression. Now I am of the opinion that the first and greatest defect lies in the fact that, no matter what the setting of the throttle is, you get the same degree of compression in the combustion chamber when the piston is at the top of its stroke. This is exactly the reverse of what occurs in a modern four-stroke engine, and it is this which causes the lack of flexibility. Excluding for the moment the release valve, by the opening and closing of the throttle we may have all the variations of mixture in the cylinder from one-fifth new gas and four-fifths old exhaust gas to four-fifths new gas and one-fifth exhaust gas, but the moment the piston covers the exhaust port we have the cylinder full of some sort of mixture. This is the root of the whole trouble, and is the cause of the hit-and-miss firing, commonly called four-stroking.

### Inefficient Scavenging.

Let us consider the crank case as a pump first. It stands to reason that should you give full throttle to the engine the piston will draw into the crank case a full supply of new mixture, and it is this new mixture that pushes the old gas out. Now you cannot push more out of the cylinder than you force in, so when the throttle is open, say one-fifth, then only a fifth part of new gas can enter the cylinder and only one-fifth of exhaust gas is expelled. Yet when the piston rises it will compress a cylinder full of very poor mixture and the spark will not ignite it. The piston has to go through another cycle and force in another one-fifth of gas before the mixture in the cylinder becomes rich enough to ignite. This is four-stroking. Fourteen years ago De Dion Co. controlled their four-stroke engines by trapping a portion of the exhaust gases and thus maintaining a constant compression pressure, but they soon discarded it, for not only did it cause the exhaust valves to burn, but overheating and lack of flexibility were the results.

This is exactly the same thing that occurs in the present-day two-strokes. You do not notice the fault so much with the little 65 mm., for most of its running is at a pretty constant speed and with sufficient supply of gas to enable the cylinders to be well cleaned out. When traffic, etc., calls for slower

**A New Design of Two-stroke Engine.—**

speed the compression release comes in handy, and so it does not show up its defects.

**A Variable Compression.**

What is wanted is such an engine that, when you give it, say, quarter throttle, a fourth part of a charge will be in the cylinder when compression takes place, and when you have this you will get in a single-cylindered two-stroke the variations of speed you get at present in a well-tuned four-stroke twin engine.

It may seem a big job to design such an engine, but if we lay down certain points as essential and try to work up to them, the task is easier than it looks. In the first place, if we are to have an engine with a range of speeds similar to that of a good motor car engine, then we must have variable compression; secondly, to enable the engine to run slowly, we must have efficient scavenging at all speeds and at all variations of the throttle. Again, to make the engine more economical in petrol, we must discard the compression release valve as a wasteful fitting, or use it only for starting purposes.

The oiling and carbonising difficulties will right themselves, provided that you have a cool engine.

Now to get variable compression in a two-stroke means that you must employ some sort of valve which *can* open at every compression stroke of the piston, and this, in my judgment, is the solution of the whole problem. Up till now we have had variable compression in the crank case and constant compression in the cylinder, whereas the reverse should have been the case.

If we put a mechanically operated release valve in the cylinder head, with a variable opening we could get variable compression in the cylinder, and we could pass back to the crank case, if need be, some of the mixture in the cylinder before it became ignited. By doing so we could discard the throttle and keep the crank case compression constant, say at 5 lb. per sq. in.

This is the most feasible solution of the problem, so let us see how it will work. By doing away with the throttle and allowing the crank case to get (by the aid of the piston) a full supply of gas, when the piston descends, this supply, being at a constant pressure, independent of the speed of the engine, would make certain that the exhaust gases were all expelled. Now that we have attained one of our points, let us see what happens to the mechanically-operated release valve. By giving it a variable lift or opening; the amount of mixture passed back to the crank case can be accurately controlled, and the pressure on the piston when it is at the top of its stroke will vary, according to the wishes of the driver, in exactly the same way as in a four-stroke engine. Thus the range of speed will correspond more nearly to that of a twin-cylindered four-stroke engine, and when slow

and quiet running is necessary you will have it in the natural way, *i.e.*, by less gas being fired in the cylinder and giving a softer thrust to the piston. Not only so, but the waste of unused mixture which goes on at present when the compression release is opened is stopped, and this helps to keep down the petrol bill.

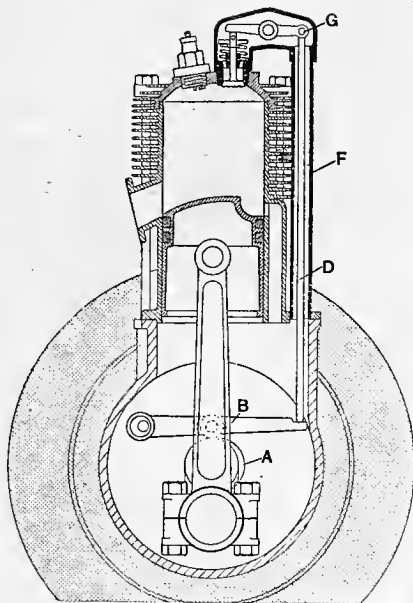
**A Mechanical Release Valve.**

The drawing shows how such a design will look. The only additional mechanism required is the cam A, rocker B, push rod D, and overhead rocker G, so that the arrangement is neither costly nor intricate. The opening of the release valve is on the beginning of the compression stroke just after the piston has passed the exhaust port, for by passing the mixture to the crank case at this moment there would be no chance of a back-fire. The rod D and rocker G are enclosed, and advantage has been taken of the tube F to make it the means of communication between the release valve

and crank case. It will be noticed that the cylinder head is made detachable. This is not only for convenience, but it is the idea of the writer that in a short time we shall have both the cylinder heads as well as the pistons of most air-cooled engines made of the new aluminium alloys, which have been talked about so much lately. These, together with a turned steel or fine cast iron cylinder, should go far in solving the overheating difficulty, and so be the means of saving an immense amount of lubricating oil, which in turn will lessen the amount of carbon deposited on the pistons, etc.

In this article I have tried to bring forward reasons for the existing faults of the two-stroke engine, and to show that these faults are mainly due to the present throttle arrangements, and also how they could be remedied. At present, experimental work, so far as the larger firms are concerned, is dead, but I believe that in the near future the two-stroke will show how its faults have been realised, and what

steps have been taken to eliminate them, while its inherent advantages of simplicity, in the number of valves and power impulses, render it the coming engine for motor cycles and light cars. JAMES MARTIN.



A design for a two-stroke engine, embodying a mechanically-operated release valve, evolved by Mr. James Martin. The letters are referred to in the description on this page.

**NEXT WEEK'S****Sidecar and Accessory Issue**

will be divided into the following sections:

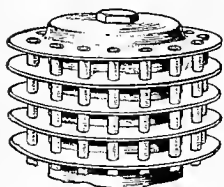
- (1) **SIDECARS.**
- (2) **GENERAL ACCESSORIES.**
- (3) **TYRES AND CLOTHING.**
- (4) **IGNITION APPLIANCES AND LAMPS.**

The usual features will, of course, be retained.

# AUXILIARY COOLING DEVICES.

A Review of Some Aids to More Efficient Air-cooling. Are the Orthodox Cast Iron Fins sufficient?

THE very instructive paper which was read by Mr. Lanchester to the members of the Institution of Automobile Engineers\* causes one to pause and consider whether the present almost general method of cooling a motor cycle engine by casting fins on the cylinder is really the most satisfactory and efficient. One remembers only too vividly the rapid carbonisation of the cylinder head and piston, pitted and broken valves, and the frequent plug troubles and other difficulties, all due in the main to excessive heat generated by even the most modern motor cycles. Cars having liberally water-jacketed cylinders suffer no such troubles. This naturally leads one to assume that the present method of carrying out the cooling system which has been general for so many years has, nevertheless, not reached a stage where improvement is impossible. Though casting radiating fins with the cylinder may be the neatest and most convenient form of cooling, there is little doubt but that the integral cast iron fins can be improved upon. The air-cooled motor cycle engine does not exist which, fitted with only the orthodox method of radiating fins, will not overheat to some degree if driven for any length of time overloaded. Overloading is undoubtedly the prime cause



The radiating fins drilled to take copper tubes, a practice favoured by many racing riders.

of overheating, and the reason the modern motor cycle engine does not show much signs of distress owing to this trouble is that by increasing the volumetric efficiency of the engine by improving the design of the cylinder, valves, and valve ports, timing, pistons, carburation, and so on, the engine has become generally more efficient, and, therefore, is not so easily overloaded, with the result that overheating does not now make itself noticeable so readily. That this is a fact is proved by the air-cooled cycle cars fitted with engines which give absolutely perfect results when used on motor cycles, but when made to drive the more cumbersome four-wheeler do not run so sweetly, and show a decided tendency to overheat. Besides, a considerably increased quantity of oil is necessary in order to keep the engine running satisfactorily, the extra heat burning the oil away very rapidly, and so causing rapid carbonisation, and, of course, less efficient running.

## How the Cooling is carried out.

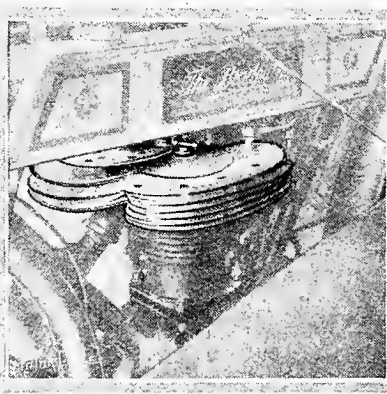
The idea of all cooling systems is to carry away the heat generated in the

cylinders, and transmit it in the shortest possible time to the atmosphere. This is accomplished by exposing a very large surface to the air, the larger the surface and the better the heat conductive powers of



Coiled wire as a radiating medium, fitted to a De Haviland (the forerunner of the modern Blackburne) cylinder in 1904.

the material used the more efficient will be the reduction of heat. It is clear, therefore, that the surface (whether it be the radiating fins of an air-cooled motor cycle engine or the radiator of a water-cooled one) should be made of a metal with the best heat conducting properties in order to obtain rapid and most efficient cooling. The finest con-



Harcourt radiators as fitted to a single-cylinder engine. Note the considerable extra cooling surface obtained by their use.

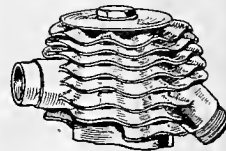
ductor of heat is silver, but the cost of this puts it out of consideration; next comes copper, which is nearly ten times, and aluminium nearly five times, better in this respect than cast iron.

## Departures from Standard Practice.

In the original Lanchester cars manufactured between the years 1900 and 1904, which proved in many respects quite satisfactory, the cylinders were cast absolutely plain, the cooling surfaces or radiators were fitted afterwards, being formed of either copper or aluminium spun discs which were shrunk on after the cylinder had been machined, thus enabling the cooling surface to be considerably increased, the thin fins occupying much less room than the cast ones.

A curious device was fitted to the American Knox car. In this instance the cylinders were cast quite plain, and into them a very large number of copper pegs were screwed, deeply grooved with a coarse thread. This device afforded a very large cooling surface, and proved quite satisfactory, especially when used in conjunction with fan cooling.

Several other devices somewhat similar to these have been used from time to time on motor cycles, but for some reason or other have never become popular, probably due to the fact that the appearance was not so attractive as the cylinder with radiating fins cast in one piece. In 1905 an engine was produced by Mr. de Haviland, now well-known as an aviator, and the original designer of the present Blackburne engine. This engine had a cylinder which was perfectly plain, and the cooling was effected by continuous wrappings of D-shaped coils of



Type of corrugated copper fins, as fitted to an old Aster air-cooled engine.

copper or brass wire; this was found most satisfactory, and the possibility of damage was greatly minimised. These coils were bound round and round the cylinder as seen in the illustration, and formed fins exposing a very great surface to the air, and also had the advantage that the angle of the cylinder did not interfere with the efficiency of the cooling. A number of years ago the Aster Co. made an air-cooled engine, the fins of which were of copper and separate from the cylinders. These were corrugated in shape in order to give a greater surface exposed to the air, and were shrunk on to the cylinder in a similar manner to those used on the Lanchester car.

## Auxiliary Devices.

A point which helps to prove that more efficient cooling would be beneficial is the improvement effected by the adoption of cooling devices such as Harcourt radiators, Koolah radiators, and Cool-guard springs, especially when used on sidecar outfits and two-strokes. These devices are designed to be fitted between the ordinary cylinder cooling flanges in order to expose a greater surface of metal to air currents.

\*Extracts appeared in *The Autocar* of December 18th, and a review in *The Motor Cycle* of December 23rd, 1915.

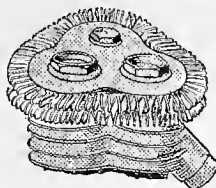
**Auxiliary Cooling Devices.**

Harcourt radiators made by Messrs. Wylie and Lockhead, of Glasgow, consist of aluminium plates with soft copper studs at one end. These plates are pressed between the existing radiators, and are held in place by the soft copper studs; by this means the existing cooling surface is very greatly increased. Koolah radiators are very similar in design, but are attached to the cylinders by means of springs, and are, therefore, readily detachable.

A device adopted by many racing motorists in the past was to drill the cylinder fins from top to bottom and insert lengths of copper tube. Such an

arrangement was fitted to the big J.A.P. twin which was used with such success in hill-climbs a few years ago by Mr. Mackenzie Cott.

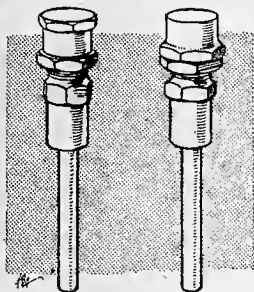
Coolguard springs consist of oval-shaped springs which spring over the cylinder, the thin edge pressing between the flanges



"Coolguards"—oval-shaped springs which fit between the existing fins to increase the cooling surface.

**SOME J.A.P. ENGINE IMPROVEMENTS.****A New Adjustable Valve Tappet.**

THE accompanying sketches show two J.A.P. valve tappets, and of these the left-hand one is the latest pattern. It will be seen that that part of the tappet which strikes the foot of



J.A.P. adjustable valve tappets. (Left) New type. (Right) Old type.

the valve stem has been, so to speak, reversed. This has the result of allowing the head to be much more readily accessible, and consequently greatly facilitates adjustment.

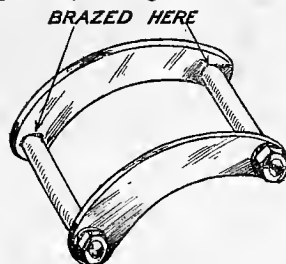
**The Oil Pipe Union.**

In the case of a drip feed it is necessary that there should be no possibility of a blow back, and attention to matters of this kind on the part of designers has much to do with the results shown in the hands of a rider. On the J.A.P. engine, when the oil enters the union, which is shown in part section fitted to a crank case, the suction draws the disc valve on to its lower seating, and allows the oil to flow through by means of saw cuts in the lower portion, and on the

down stroke of the piston the small disc is blown by the crank case pressure off the lower seating on to the upper one, thus preventing a blow back up the oil pipe.

**AN ALTERATION TO DOUGLAS SPRING FORKS.**

AN officer of our acquaintance at G.H.Q. in France has a special method of treating the spring forks of all Douglas motor bicycles—and these number about eighty—which come under his care. Readers will remember the horizontal curved links on these forks, and the bolts, nuts, and spring washers which connect them. His method is to braze the bolts, nuts, and links together on one side, as if this is not done the bolts or spindles are apt to seize probably through want of lubrica-



tion, and when this happens the only bearing surface available is the hole in the link, which, on account of its narrowness, rapidly wears through. Already one junior suffered a severe fall through this happening. Such a contingency is not likely to occur in England, and certainly will not do so on the new W.D. Douglas.

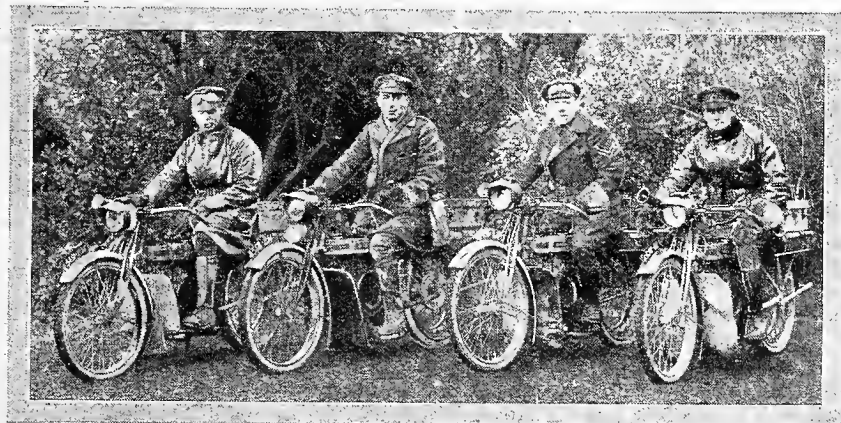
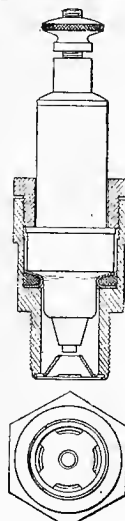
in a similar manner to the other devices which are designed to increase the cooling surface. The fact that auxiliary devices have undoubtedly proved infinitely superior to the present orthodox method of air-cooling is being gradually realised by leading manufacturers, who are experimenting with such fittings as aluminium cylinders, pistons, and so on. As an outcome we should not be far wrong in predicting that in the near future the air-cooled motor cycle engine will not be far short in cooling efficiency of the water-cooled type, while the weight, complication, and general nuisance of the latter (especially in frosty weather) will be missing.

**A NOVEL SPARKING PLUG.**

WE illustrate herewith a sparking plug which is the invention of Maurice G. W. Burton, formerly secretary of the Cambridge University M.C.O., and at present a lieutenant in the A.S.C. (M.T.)

The chief point about the plug is the design of the electrodes, which are so arranged that sooting should be impossible. The gap is at the apex of a cone or conical passage directed into the plug body, so that the gases as they are compressed in the cylinder will pass through the spark gap with increased velocity, carrying with them any foreign matter which may tend to accumulate on the electrodes. This foreign matter can then be drawn off or drained away from the passages formed at the base of the cone.

The idea is that the cone acts as a venturi tube; it is certainly novel and ingenious, but not having tried the plug we are unable to say whether or not the inventor's ideas have been attained in this particular.



DESPATCH RIDERS STATIONED SOMEWHERE IN NORFOLK.

We are told that each of the four men shown covers on an average 2,800 miles per month. Their names are: Corporals Webb, Russell, Ingledew, and Binder—all on Douglases.



## OCCASIONAL COMMENTS.

By "IXION."

**Tot Homines, Quot Sententiae.**

Differences of opinion would tend to be less acrimonious if controversialists would give each other credit for a little commonsense and sincerity. Here is a case in point. My pen has been straying of late into remarks upon the merits and demerits, the future and the past, of four-cylinder motor bicycles. During a given week I receive, perhaps, a dozen letters on the subject, most of them apparently from well-meaning and well-educated men, all alike keen on the best interests of the sport and hobby. To some of them the four-cylinder is *anathema maranatha*: their very pens splutter on the paper as they discourse of its lubrication, its decarbonisation, its shaft drive, and so on. Others, on the contrary, write with cool, scathing derision of all other types of engine. Knowing a good deal on the subject from much personal experience of fours, I am hardened in my conviction that neither the shaft drive nor the four-cylinder engine is exactly ideal for the average user, but that, on the other hand, a clever and thoughtful rider, with a little surplus leisure, may be better suited by a shaft-driven four than by anything else. Putting this very sane and judicial conclusion on paper, I am naturally bespattered with venom by three separate classes in the community, viz.:

1. The designers and vendors of four-cylinders, whose partiality is largely pardonable and natural.
2. The duffer owners of four-cylinders, who expect a motor bicycle to be as self-sufficing as a corkscrew, will not realise that they have bitten off more than they can chew, and simply hate to hear a single word said in praise of a machine which has bested them.
3. The expert and practised riders of four-cylinders, whose comparative experiences of simpler makes are often limited, and who simply do not know what duffers the rank and file of motor cyclists still are.

**Another Case in Point.**

Quite early in the motor cycling era I drove a certain single-cylinder machine over 10,000 miles without a single deliberate decarbonisation, the carbon being merely removed twice as a kind of accident, when the piston rings gave trouble. I have not the least doubt that similar claims could be made in respect of modern high-efficiency engines by a very few riders in the kingdom. If we equip a very cautious and methodical rider with, say, a 4 h.p. Triumph, which is thoroughly well run in; if he never takes out a sidecar and never "scraps"; if he uses a first-rate oil, and injects it with great precision as to quantity and frequency; if he eschews throttle braking; it is more than possible that after, say, 4,000 miles his engine would still be eminently usable.

On the other hand, most new engines require decarbonisation in ordinary hands before the first 1,000 miles are up, and the average owner, whose oiling is short of precision, who often uses a sidecar, or goes in for speed stunts, or is keenly fastidious about the running of his engine, certainly begins to speculate when a convenient moment for the job will arrive as often as his speedometer changes the figure in the extreme left-hand niche of the mileage register.

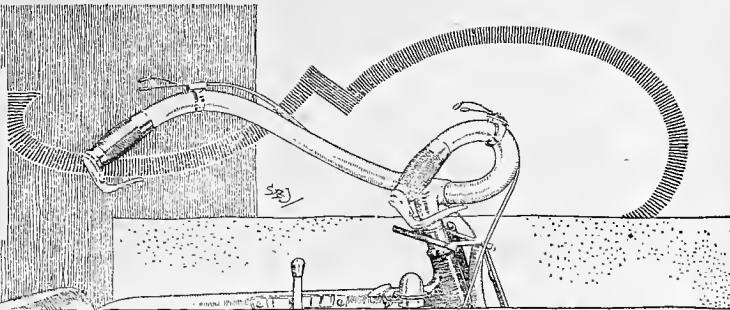
So, if one rashly hints that comparatively few engines

run much over the 1,000 miles between decarbonisations, one is between the devil and the deep sea—the individual who is getting his 3,000 or 4,000 on each dismount of the cylinder, and the confused, roaring, billowy crowd who are "decylindering" every 800 miles or so, and are proportionately enraged because their compression is worse than when they started on the job.

**Verdant Green.**

This tale has a moral. Indeed, it bites down so deep into the universal experience of motor cyclists that in future ages it may even crystallise into a solar myth. Verdant Green bought a motor bicycle; one of the best; the kind of lordly sidecar puller that is listed at the price which a good second-hand light car would fetch. Moreover, he bought it in war time; and so, when the makers' packer sought a book of the words to put in the tool bag, only the 1915 edition was available. In this 1915 manuscript the guileless reader was informed that the oil was turned on when the tap handle was parallel with the oil pipe. Nobody dreamt of adding a marginal gloss to the effect that in "our 1916 model" the oil tap worked in exactly the contrary way. Verdant Green received delivery by train and lorry. Verdant Green, like a wise man, worshipped the machine for a time and times and half a time before he dared to do more than straddle it shyly in the garage. He also learnt the book of the words by heart, and read three copies of *The Motor Cycle* from cover to cover, including the small prepaid ads. Then the sun shone out again, and Verdant Green took the road. For a few miles all went well. Then horrible noises manifested themselves in the engine's belly, and Verdant Green, being less verdant than you might suppose, brought the machine home by train, and tore round to fetch the local expert to look at it. Quoth Verdant, "She" (he had already recognised the intrinsic femininity of our capricious little tormentors, you see!)—"She gets very hot, and clanks loudly; *The Motor Cycle* says that means she doesn't get enough oil!" The local expert (a sporting plumber) promptly suggested that the oil was turned off. V.G. quoted the book of the words at great length. Unconvinced, the expert set to work to verify the point by disconnecting the oil union. The oil union was very tight. Moreover, it was attached by a drip valve and another nut to a light tube. The whole contraption turned under spanner suasion, whilst the nut remained refractory. The plumber waxed impatient. He forgot all he knew about nuts, which wasn't much, and pulled hard. He ripped the whole contraption out of the tank. Point for our Legal Editor: Should Verdant Green pay the makers' repair bill of £6 odd (new bushes, new tank, etc.) on the ground of his greenness, and on the ground of the plumber being such a very local expert? Or should the makers put the machine right gratis, on the ground that their book of the words lied, and that their tool kit was grotesquely inadequate? Oh! I nearly forgot the moral. My dear reader, *always* verify the oil-feed of your new machine by unscrewing a union, and buy two special spanners for the job, unless you wish your last state to be worse than your first.

## TWO-STROKE ENGINES.



### THE CAUSE AND REMEDY OF RATTLE AND FOUR-STROKING.

**T**HERE has been much discussion of late on the subject of engine rattle in two-strokes. Now

I am quite convinced that in nearly all cases this rattle is simply due to overheating or a dirty engine—generally a combination of both. When my engine got to the worst stage of “rattle,” it would never make a sound of it if suddenly accelerated from cold up to 30 m.p.h., while when warm it got very noisy directly the speed exceeded 20 m.p.h., though, strangely enough, it was always silent below that speed even if very hot. I also found that a thorough cleansing of piston and cylinder cured it at once, and that then it would reel off mile after mile at 25 m.p.h. without a sign of rattle or overheating. Overheating can always be detected immediately by raising the exhaust (compression release) when travelling at a good speed; if quite cool there is no sound but the hissing of the release valve; if getting hot a rattle will be heard, and this long before any distress is shown by the engine’s pulling powers. I always use this plan by which to regulate my drip-feed, as I find, to get the best results and economise in oil as well, the regulator wants frequent alteration to allow for hills, speeds, temperature, and fullness of tank, all of which cause a variation in the drip-feed to be necessary.

When a two-stroke begins to run badly, to overheat and rattle, a temporary improvement can often be effected by simply taking off the exhaust pipe and taking out the sparking plug. The first place to become choked by carbon is always the exhaust port, and this makes a tremendous difference to the running by causing bad scavenging; some amount of carbon can be dislodged from top of piston and inside cylinder with a screwdriver through these two apertures, and the port itself carefully cleaned. This is only the work of a few minutes. Of course if time allows, taking down the cylinder makes a proper job of it. Back pressure through a choked silencer also badly affects scavenging in a two-stroke.

#### Four-stroking.

Almost every week questions are asked anent “four-stroking.” I have a Levis which was very prone to the fault, never two-stroking regularly unless it has considerable load, such as a hill, a head wind, or when accelerating, in which circumstances it fired properly and regularly. I tried a larger jet (it was fitted with a 24 Amac) which at once accentuated the fault, showing plainly that the cause was too rich a mixture. I then fitted a 22 jet. At first I could

not get it to run on that; it continually fired back through the carburetter. However, I persevered and discovered that by keeping the air lever closed till the engine was quite warm and then opening it very gradually it would run as well as ever it did, and climb hills quite as well; and when the engine was once running well, I could keep the air lever fully open at all positions of the throttle except full throttle for a steep hill. Also this entirely cured the trouble, and now I know if it four-strokes down a slope that there is one cause and only one—too much oil—and that is handy to know at night. Incidentally, the consumption has been raised from 90 to 120 m.p.g., and the engine runs much cooler; I always fancied there was something wrong when I could start with air lever fully open.

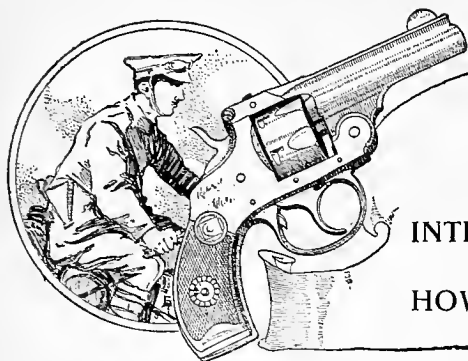
#### The Position of the Sparking Plug.

As regards plug position, surely the best place is at the back just above the transfer port, so that it gets the benefit of the cool inrush of mixture every induction. I had some trouble with plugs and found that a well-known plug sooted up very much. Some eight months or so ago one was advertised in *The Motor Cycle* at 1s. 6d. (I believe it is dearer now) by using a coupon in the advertisement. I tried one and it has run now 3,000 miles without once cleaning and still works perfectly.

There have been many theories expounded as to why a two-stroke should rattle and a four-stroke should never make the same sound. I think, from observation, that the cause is to be found in the shape of the piston head. In the four-stroke this is at right angles to the sides, in the two-stroke it slopes off at a very sharp angle from the cylinder walls. When cleaning I noticed that carbon had formed considerably in this angle and was finely polished by friction. The removal of this carbon at once cured the rattle. It seems that this carbon “ring” fills up the space at the base of the piston head just as the piston ring does lower down, but having no recess or spring to draw back, when the least contraction is caused in the upper part of the cylinder by the expansion of the metal by heat (rather a paradox but true) this ring of carbon hits the cylinder on the upstroke, and thus causes the rattle.

“Rattle” is not caused by pre-ignition, as when the spark is too far advanced an ordinary “konk” is produced. Again, as to various mixtures, I find a weak mixture causes backfire, and an over-rich mixture causes four-stroking.

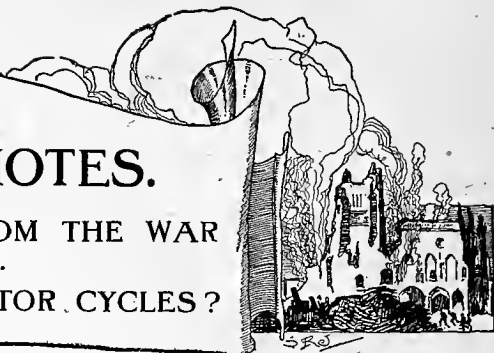
ROYLAT.



## MILITARY NOTES.

INTERESTING ITEMS FROM THE WAR THEATRES.

HOW MANY ALLIES MOTOR CYCLES?



### MECHANICS WANTED.

THERE is an opening for a dozen expert motor cycle mechanics acquainted with Clyno motor cycles. These men are required for duty in one of the Mechanical Base Depots in France. Accepted men will be enlisted under special arrangements with the War Office, and, presumably drafted to the A.S.C., M.T., and will be required to proceed to France at once. Applicants should mention age and experience, enclosing photograph, in an envelope marked "Overseas," and address their letters, not to the Editor, but to the Clyno Engineering Co., Wolverhampton.

### HOW MANY MILITARY MOTOR CYCLES?

HOW many motor cycles are there in the British Army, or, to go one better, what is the total number of motor cycles in use by the Allies? Here is an interesting problem for readers. No official figures have been published; indeed, we very much doubt if they are available, so that it cannot be deemed an injudicious act for amateur estimators to get to work. Great Britain, of course, uses the largest number of motor cycles by far, as they are employed not only largely for despatch riders, but also in the transport of machine guns and for the conveyance of officers on

inspection work. The numbers might be anything up to 10,000 to 12,000. As regards our Russian ally, over 3,000 machines were employed by the Russian Army in the first year of war, and the number has been constantly augmented by regular British and American supplies. The French Army possesses a great many motor cycles and sidecars for despatch riding, ambulance, and general utility work, but not so many as England or Russia. The Italians use motor cycles very largely, both solo mounts and sidecars, and there are a good number of motor cyclist messenger carriers attached to the Belgian Army. All told, we should estimate that there are more than 20,000 motor cycles in use by the Allies, and every week the number is being increased.

### "THE MOTOR CYCLE" IN FORSAKEN PLACES.

THE photograph of despatch riders attached to the 35th Division Signal Company, reproduced on this page, was taken a few days ago, but by the time the issue is published the men will probably be out of England. They have completed their training in a dreary part of the country, and Sergeant Frew Jones, in sending us the photograph, says *The Motor Cycle* has been most appreciated "in this forsaken place."

### DESPATCH RIDERS ATTACHED TO 35th DIV. SIGNAL CO.



(Back row from left to right) Q. M. S. Instructor A. E. Shaw, Corporals H. H. Goodhead, A. Pembroke, A. M. Nias, T. B. Little, H. C. Love, Art.-Cpl. A. H. Barnsley, and Corporal Yarnold. (Centre row) Corporals A. R. J. Goodey and J. Woodward, Sergt. H. Frew-Jones, Corporals S. Beacham and S. G. Cranstone. (Front row) Corporals E. C. Sheploc, A. Bond, J. Eayrs, R. V. Lawton, H. O'Keith-Ayling, and Art.-Cpl. W. Bowcott.

### MILITARY MOTORISTS AT PLAY.

AMID the horrors of war on all hands comes the news of a cricket match held at Alexandria on Christmas Eve between a team of R.E. despatch riders and one from men of the Royal Naval Armoured Car Division. The former won well—total runs 99 for six wickets, their opponents scoring 94. We have to thank Corporal H. Pughe-Lloyd for the results.

### STAFF MEMBERS ON SERVICE.

WE are pleased to announce that H. D. Teage (late sub-editor on the staff of *The Motor Cycle*), who last spring was appointed instructor on engines at the Royal Aircraft Factory, has now been granted a commission in the R.F.C., and is at present on important work in France.

Other members of the staff of this journal in H.M. Forces are:

Sec.-Lieut. Noel C. Barnes, 4th South Mid. Howitzer Brig. (Editorial Dept.).

Pte. S. Witham, 320th Coy., M.T., A.S.C. (Editorial Dept.).

Pte. T. W. Parker, M.T., A.S.C. (Editorial Dept.).

Sec.-Lieut. H. B. Elliott, M.M.G.S. (Advertisement Dept.).

Sec.-Lieut. A. J. Palmer, M.M.G.S. (Cashier's Dept.).

It may be added that two of the present members of *The Motor Cycle* editorial staff have seen active service in France, and were subsequently discharged owing to ill-health. The remainder have attested under Lord Derby's scheme.

The total number of employees of Messrs. Iliffe and Sons, Ltd., proprietors of *The Motor Cycle*, and allied papers; who have joined the colours since the outbreak of war, is now 144.

Sec.-Lieut. M. A. J. Orde, A.S.C., has been transferred permanently to the R.F.C. Mr. Orde, who was formerly a keen rider of a Rover motor bicycle, has had many thrilling experiences in France as an R.F.C. observer, and once was successful in bringing down a German aeroplane.

An R.E. officer in the Motor Cyclist Section stationed in Macedonia has written home to the effect that he and his comrades in arms had an excellent Christmas dinner of turkey, which was done to a turn in a five gallon petrol drum over two Primus stoves. Evidently the drum must have been very carefully cleaned beforehand, otherwise the flavour of the bird might have been spoiled.

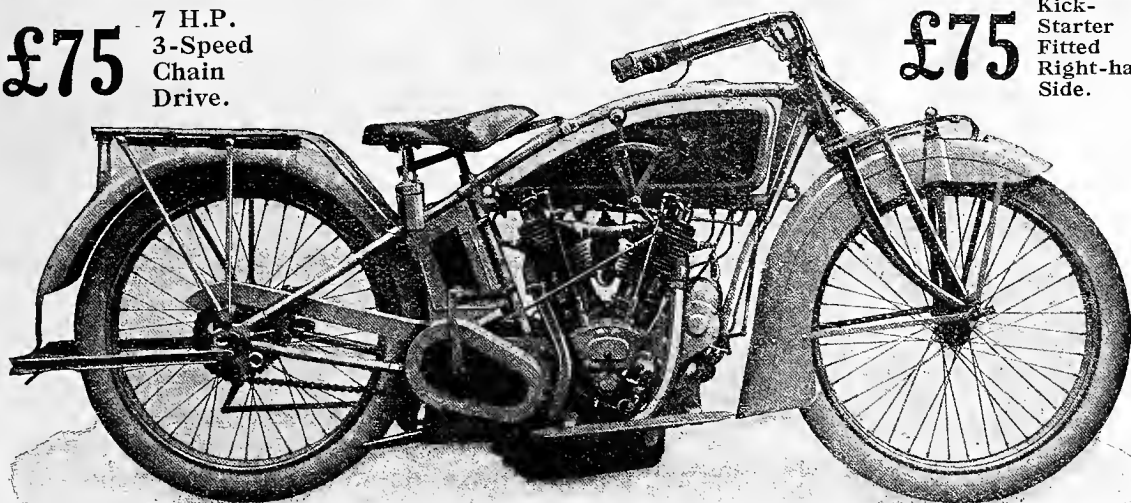
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# American EXCELSIOR

## BETTER VALUE THAN EVER.

£75 7 H.P.  
3-Speed  
Chain  
Drive.

£75 Kick-  
Starter  
Fitted  
Right-hand  
Side.



The most perfect motor cycle it is now possible to produce. When a better motor cycle is built it will be an Excelsior. The serene consciousness of personal safety, with absolute certainty of troubleless travel, is only one of the pleasures of riding an **X**.

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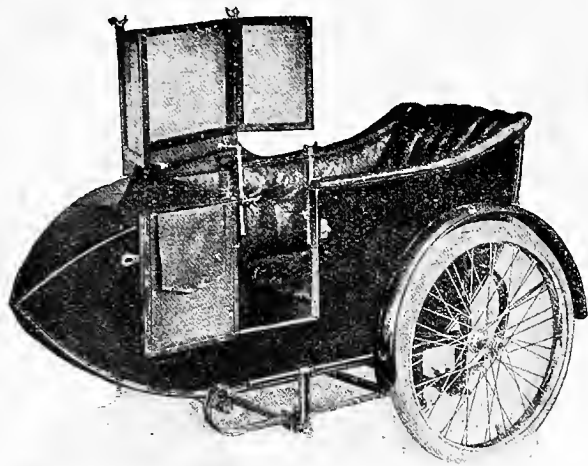
*Preliminary Specification from Sole Concessionnaires—*

**HARRIS & SONS,** 10-12, Great Chapel Street,  
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Telephone—REGENT 3906.



# DUNHILLS PATENT TRIPLE WINDSCREEN.



In Polished Walnut with Nickel Fittings :

Price complete with side wings - - £3 0 0

Price of Single Screen - - - £2 2 0

**A**N ideal windscreen—keeps the passenger always snug and cosy in the coldest weather and free from draughts.

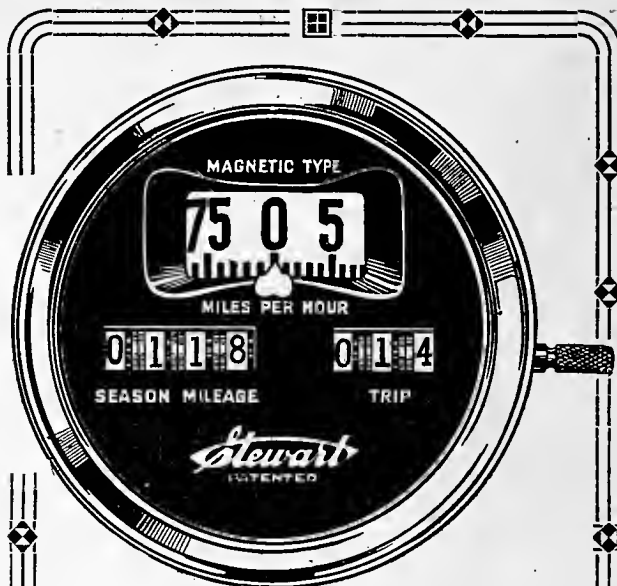
The side wings are detachable, and the screen can be tilted to any angle. It will fit any make of car.

A twist of a wing nut is sufficient to release the catch and let the screen swing across and allow the passenger to alight.

**Dunhills LTD.,**  
359-361, EUSTON RD., LONDON, N.W.  
— 42-43, LOMBARD STREET, E.C. —

MANCHESTER :  
90-92, Cross Street

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The

## Stewart SPEEDOMETER

*The perfect speed and distance measure—a beauty in appearance, a marvel in accuracy.*

Speedometers that cost more than the *Stewart* are priced high—not because they are better—but only because they are fewer; the extra price doesn't represent value—it only means a smaller output.

The *Stewart* is the best speedometer that can be made, and it is sold at a minimum price. Other makers cannot supply a comparable instrument at double the price.

### MOTOR CYCLE MODEL.

**50/-**

Registers from Zero to 75 m.p.h. Season Mileage 10,000 and repeating Trip recorder 100 and repeating. Will fit either side of front wheel, or back wheel fitting supplied at no extra cost

*Write for Booklet.*

The Cooper-Stewart Engineering Co., Ltd.,  
11, Broad Street, Bloomsbury, London, W.C.

## Military Notes (continued).

## SIX MONTHS' DESPATCH RIDING.

CORPL. HOWARD LANE, one of the original founders and first secretary of the Sutton Coldfield club, was home on leave last week, and we had the pleasure of a few minutes' chat with him on Wednesday. He is attached to an ammunition column which at present is billeted in the same village as the No. 5 Battery, Motor Machine Gun Section. All is well with the famous No. 5, and no casualties have occurred of late, though the men are taking their turns in

Triumph, which, beyond the breakage of the spring fork, has given no trouble. He emphasised the appalling condition of the roads, and said that after the war nobody will complain of trial routes at home.

## DESPATCH RIDERS WITH THE MEDITERRANEAN FORCES.

LANCE - CORPORAL LANGLEY, of the 1/1 R.E., R.M.R., with one of the Mediterranean Expeditionary Forces, in a letter to us received a few days ago, says that he and his comrades are located in a long gully, and have to go up a hill, cut in the cliff, about 500 yards in length. There are a couple of bends, the gradient is very steep, and the mud awful. However, his countershaft Triumph gets up splendidly, but his experiences make him long, like many others, for the good roads of England. Langley has six Triumphs and one Sunbeam under his charge, and all are going well.

## A "COMPOSITE" MOTOR CYCLE BUILT FROM WAR DERELICTS.

## Work of a Reader Behind the Firing Line.

WE hear a good deal of the number of machines "scrapped" on war service, but the letter reproduced herewith provides, we believe, the first instance of another machine being built from the remaining sound parts of "scrapped" ones. Further interest is added to the fact that the composite mount referred to was built behind the firing line in France by an artilleryman during his leisure hours. Needless to say, he is a very keen man, and the whole job reflects credit upon him. His name is E. Moslin (Bomb.), and his description reads as follows:



One way of using up war "scrapped" machines. A composite machine built behind the trenches by Bomb. E. Moslin. (See letter.)

the trenches. At present the sidecars are used very little, but all hope that the time is not far distant when an opportunity will occur of showing the capabilities of the M.M.G.S. in work for which it is specially intended.

Howard Lane looks remarkably well, and apparently thoroughly enjoys his work. He is very pleased with his



Lance-Corporal Langley, R.E., who is with one of the Mediterranean Forces.

"I put this machine together whilst in the firing line. It is composed of three different makes—Douglas, Scott, and F.N., but mostly Douglas. Each of the original machines had been badly hit and burnt by shell fire, and was practically scrap. When I hauled the derelicts to my battery on a two-wheeled truck and told my comrades that I was going to build a complete machine from the ruins it caused much amusement.

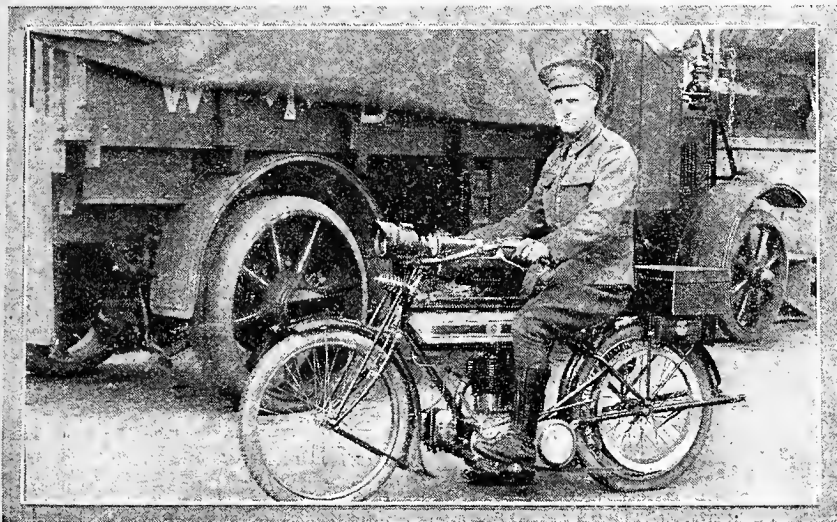
"The job was finally finished, less magneto and front fork springs, and these I had to purchase. The machine has now been running continually every day, and a good many nights, for eight months. During this time it has covered a few thousand miles on the rough roads in the war zone.

"The old timing case cover had been burnt away, and was replaced by a wooden one. The upper portion of the crank case is also burnt away, leaving the magneto timing wheel half exposed.

"In place of an h.t. wire I used ordinary single strand telephone wire (copper), and it has answered very well. The footrests were missing, so I made some in the following way: Obtaining an ordinary bicycle crank, and placing it upside down, I passed the pedal end through the slots which are made on a Douglas frame for the gear box to slide in, this being a tight fit. I then passed a bolt through the upper threaded end (or pedal end) to stop it dropping down. I then passed a length of 1/4 in. iron rod through the cotter end, and fixed this by tightening up the cotter pin. The rests were five to six inches from the ground, and very useful on greasy surfaces.

"The handle-bars are ordinary F.N. bars, but are opened out to their full extent; this gives good control on grease. The tyres and tubes were second-hand Dunlops, and after eight months' running are still in good condition.

"The machine is capable of doing a good forty miles an hour. It has been running in all weathers, and never been cleaned, so one can imagine its external condition. I am very proud of it, especially as so far it has not let me down. I may mention that the frame has two nasty cuts in it, which were caused by pieces of shell."



Corporal Howard Lane, formerly a leading light of the Sutton Coldfield A.C., who has seen six months' despatch riding in France.

Dr. A. M. Low, R.F.C., has been promoted from Second-Lieutenant to a Temporary Captain.

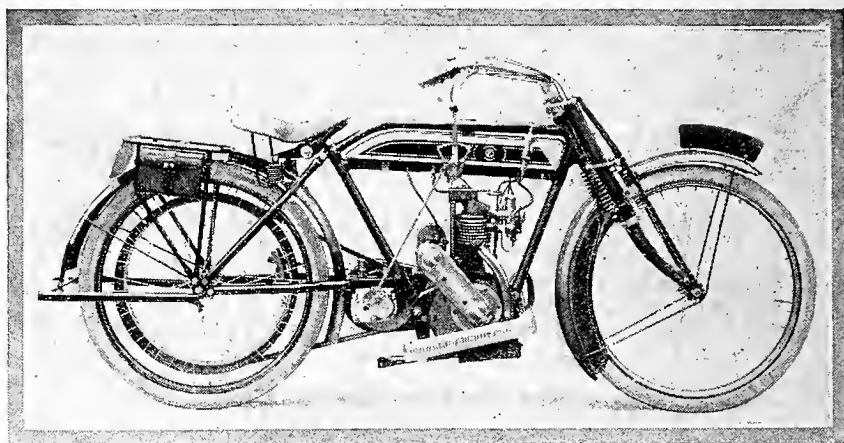
## Another $2\frac{3}{4}$ h.p. Four-stroke Lightweight.

The Latest O.K. Junior with Overhead Inlet Valve.

**I**N our description, on January 6th, of the O.K. Junior lightweights we mentioned, but did not describe, the new Mark VI., which may be called the *modèle de luxe* of the O.K. factory. The engine has a bore and stroke of  $64 \times 77$  mm., which brings it into the 250 c.c. class, the exact capacity being 248 c.c. The bearings are unusually large, and, consequently, the engine should wear well and give no trouble; the valves also are as large as those found in a 5 h.p. twin. The overhead inlet valve mechanism is entirely enclosed, and requires but occasional lubrication.

The gear box provides two speeds on the dog clutch principle, an ample lubricator is placed on the top of the box, and the controlling lever is provided with springs so placed that it is impossible for the lever to slip out of engagement. The transmission consists of a chain to the gear box and belt to the rear wheel.

The rear brake is applied to the belt rim and operated by the left foot. The lever is placed above the footboard in such a manner that it can be applied without removing the heel from the footboard. This makes it possible to apply the brake with great smoothness.



The neat-looking  $2\frac{3}{4}$  h.p. four-stroke O.K., which has the customary combined chain and belt drive. A two-speed countershaft gear is fitted.

The tank has a capacity of one gallon of petrol and one quart of oil, and is provided with large and high filler caps and a syphon drip feed, controlled by a Best and Lloyd sight feed to carry lubricant to the engine. The frame dimen-

sions are as follow: Height of saddle, 30in. to 31in.; clearance,  $6\frac{1}{2}$ in.; wheelbase, 51in. The tyres are Clincher de luxe, 26in.  $\times$  2in. An Amac carburetter and E.I.C. magneto are standard fittings on this machine.

## Petrol—Price and Supply.

How the Value has Gone Down and the Retail Price Increased.

**T**HIS subject is dealt with in a leading article. Recently we have suffered another rise in the price of petrol, which now, with the additional tax of 3d., costs 6d. more

than it did a few months ago. Moreover, last week the importers of Shell petrol announced that, owing to the large quantities which they were supplying to the Allies for military purposes,

there was likely to be a difficulty in meeting the requirements of private owners unless they could largely curtail their demands. Fortunately, this is not so serious for motor cyclists, who can travel upwards of 100 miles on a gallon of petrol, as for car owners, whose mileage is often in the neighbourhood of 20 m.p.g., but it is quite serious enough. Up to the time of writing the vendors of Pratt's spirit have not announced any probable scarcity, nor should there be any further rise in price. There is a movement on foot to limit the retail price. Meanwhile private owners should limit their requirements to a minimum and refrain as far as possible from driving simply for pleasure.

A careful study of the Board of Trade returns shows no reason for higher prices or any shortage, so that an explanation must be sought elsewhere. Nearly half as much again was imported in 1915 as in 1913, and this, we imagine, cannot include the petrol used at the Front, which goes straight to France. Comparing the totals and the value for the last three years gives the following figures:

	Gallons.	Value.	per gall.	Retail.
1913. ..	100,858,017	£3,803,397	9.05d.	1s. 8d.
1914. ..	119,030,155	£4,301,865	8.67d.	1s. 9d.
1915. ..	144,939,700	£5,262,547	8.71d.	2s. 2d.

This shows the wholesale price per gallon to be less than in 1913, when the retail price was 1s. 8d., compared with the present price of 2s. 2d.



THE UNITED KINGDOM IN FRANCE.

Reading from left to right the four riders shown are of Scotch, English, Irish, and Welsh nationality, a background being afforded by a number of French and Belgian soldiers. We have to thank the Welshman, Lance-Corporal Allen S. Jones, for the photograph. Jones competed in two Tourist Trophy races, and his doings in the war were referred to in our last issue.

## A Motor Cyclist Territorial in India.

Impressions Gained after a Year Overseas.

FROM a long letter from Corporal A. Dendy, now with a Territorial regiment in India, we have been able to gain some instructive information regarding motor cycling matters, both from a peace and war point of view, in parts of India.

Corporal Dendy's regiment reached Cawnpore early last December. At Cawnpore, he tells us, the motor cycles most in evidence are Triumphs, Ridges, Douglasses, Enfields, Rovers, Zeniths, B.S.A.'s, and Indians, and he came across an old Midget Bi-car, which on the level roads surrounding Cawnpore pulls a sidecar well. There appears to be no trouble from overheating, despite the high temperature, but the average machine is not kept in the good tune one is accustomed to note at home. This, Dendy considers, may be due to the fact that there are no hills around Cawnpore, and consequently local riders do not bother about keeping their engines up to concert pitch. Perhaps also the heat does not encourage tinkering with a machine until it is absolutely necessary.

There are many level crossings in the district, and Dendy saw several machines the owners of which had evidently tried conclusions with the crossing gates.

### The Himalayas not the Place for Motoring.

Three months of the summer were spent at Darjeeling, in the Himalayas. The scenery here, needless to say, is grand beyond all measure. From a place known as Tiger Hill, twelve miles from Darjeeling, Mount Everest is visible, though 105 miles away. One has to go overnight to get a view of Mount Everest at day-break, owing to the clouds rising from the valleys in the early morning. During his three months' stay Dendy only saw a couple of machines—a Douglas and a four-cylinder F.N. sidecar—and this scarcity is not difficult to account for, as the only good road in the vicinity is that from Lebong to Darjeeling—a distance of 4½ miles.

On leaving Cawnpore, Corporal Dendy proceeded with his regiment to Nowshera, on the N.W. frontier, to relieve regulars from garrison duty. The headquarters of the No. 1 Mechanical Transport are situated at Nowshera, and upon arrival volunteer car drivers and mechanics were asked for, and Dendy found himself driving a lorry. The convoy consisted of a mixed fleet, and after a month of overhauling it was ordered to Peshawar to carry supplies from there to a camp

fifteen miles away. There were three Triumphs, two 6 h.p. New Hudsons, and one 6 h.p. Abingdon King Dick at the M.T. headquarters, and one of the New Hudsons was attached to Dendy's convoy.

### Many Road Obstructions.

The roads apparently are in a fair condition, though the dust is terrible. Motoring is not all honey, as in addition to the dust there are camel teams, bullock carts, mule carts, and stray dogs and chickens. The camels are the worst offenders, as there is only one man to every four, and they break their ropes, shed their loads, and are off. It may be just as well to add that these conditions do not apply throughout India, but prevail in the Peshawar district, and doubtless the extra military activity due to the war has much to do with it. Many of the officers of regiments stationed out there use motor cycles, and Dendy saw a few Triumphs and one Indian.

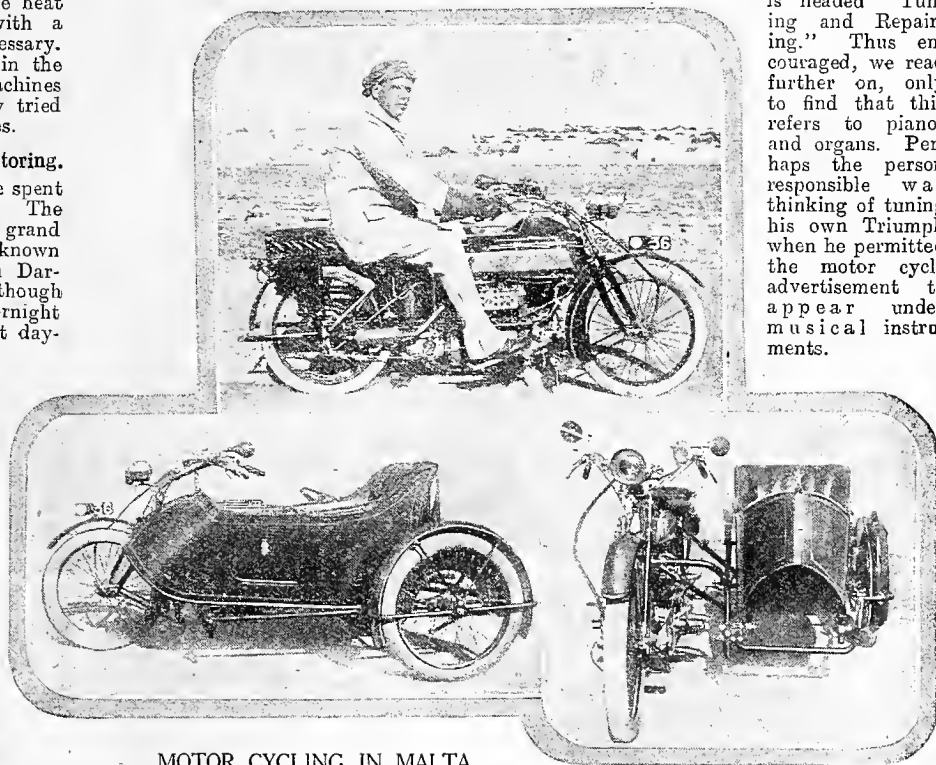
### A "Blind" through the Khyber Pass.

At intervals the convoy goes through the famous Khyber Pass to Lundi Khotal fort, a distance of over thirty miles. There are some tempting stretches of road on this route, so tempting, in fact, that, when Dendy was acting as relief driver, he persuaded the motor cyclist to change places with him so that he could enjoy a "blind" on the New Hudson.

Corporal Dendy concludes one of the most interesting letters we have ever received from Overseas with the statement that white metal bearings are a failure in India, judging by the fact that six have gone in six weeks, and on different types of lorry engines.

From *The Edinburgh Evening News*, December 23rd, "Musical Instruments: Triumph, 3½ h.p., 1909, Brampton gear, splendid order, new belt, lamp, good tyres; £21." This seems bad enough, but the next advertisement underneath

is headed "Tuning and Repairing." Thus encouraged, we read further on, only to find that this refers to pianos and organs. Perhaps the person responsible was thinking of tuning his own Triumph when he permitted the motor cycle advertisement to appear under musical instruments.



MOTOR CYCLING IN MALTA.

There are a number of motor cycles and sidecars in Malta, and our illustrations show a fine 7 h.p. four-cylinder F.N. passenger machine (with Speedwell sidecar) owned by Mr. A. Cochia Zammit, of Zeitun, Malta, who is shown driving. The owner reports that it has given very satisfactory service.





## SPECIAL FEATURES

AUXILIARY COOLING DEVICES.

MILITARY NOTES.

NEW DESIGN OF TWO-STROKE.

## TIME TO LIGHT LAMPS

GREENWICH TIME.

Jan. 20th	...	...	4.54 p.m.
" 22nd	...	...	4.57 "
" 24th	...	...	5.0 "
" 26th	...	...	5.4 "

## Sidecars and Accessories Next Week.

The latest in sidecar attachments and accessories of all kinds will be reviewed and illustrated in the next issue of *The Motor Cycle*.

## Royalty and the Motor Cycle.

A year ago a Sunday paper told a cock-and-bull story about the Prince of Wales and a motor bicycle he never rode. Now a weekly paper tells us that Prince Henry is a convert to the best of pastimes, though he is not yet allowed the freedom of the roads, and does not show Prince Albert's enthusiasm for mechanics. We trust that the rumour is true, as it would indeed be gratifying to know officially that motor cycling is a pastime of the sons of kings. That it should be so is only what it deserves to be. Here's to it! There is nothing like it!

## The Coventry Motor Machine Gun Battery.

H. Hegan and S. Hathaway, who were in the first motor machine gun battery recruited by the Editor in November, 1914—the No. 5—have been granted commissions. Sergeant-Major Palmer, of the same battery, received his commission some weeks ago. Sergt. W. A. Davenport, who has been ill for several months, is, we are glad to say, quite well again. He called on us last week and reported that he was joining an A.S.C. company.

## Sutton Coldfield Club to Carry On.

Mr. James St. John informs us that there is no intention of closing up the Sutton Coldfield and Mid-Warwickshire A.C., but no competitions will be held while the war is on. For last year only members not on active service were called upon for subscriptions, and none will be asked for this year. If, however, any member desires to continue membership of the A.C.U. he must send his affiliation fee direct to the A.C.U. secretary.

Members of the Sutton Coldfield Club have given a trailer ambulance to the Birmingham Red Cross authorities, and the necessary amount for the purchase of a second one is nearly complete.

## Light Dimming Discs.

The Automobile Association and Motor Union has arranged for the manufacture of a lamp disc for use by motorists when entering the areas where the new Order, which came into operation on Monday week, renders the use of such discs compulsory. Members who require these discs should communicate (stating the diameter of the front glass) with the Secretary, Fanum House, Whitcomb Street, London, W.C.

## A Case of a Choked Petrol Feed.

The other day when we were trying a totally new and strange machine, the symptoms that the petrol feed was obstructed were soon experienced. This happened as soon as we opened the throttle, and the machine would cease firing after a very few seconds' running. The float chamber was found to be almost empty, and filled again extremely slowly. The machine would then run quite well for a short distance and stop again. Comparatively slow progress was made for two or three miles, and when an opportunity presented itself the matter was investigated. The petrol tap was provided with a sump lined with gauze. Before this could be removed all the petrol had to be emptied out of the tank, and on the gauze being examined it was found that practically the whole of the orifice was covered by a flat piece of solder, and there also remained therein a piece of soap and several pieces of solder, so that the fuel had small chance of reaching the carburettor at all. The matter was, of course, caused by arrant carelessness on the part of the tank makers, but such trouble is much too frequently experienced by motor cyclists.

## The Public Schools M.C.C.

The Public Schools Motor Cycling Club, like many others, has suspended all activities during the period of the war. Many of its members, and most of the committee, are now serving their country, while two of the latter have, sad to relate, lost their lives at the Front. The secretary, Clive Preen, is an R.A.C. car driver attached to the R.E.'s stationed in Essex, in whose service he has already worn out two motor cars and is now in need of another. W. Tallboys Getting is unfortunately among the missing, and was never heard of after crossing Fosse 8. R. L. Keller, who is serving with a Warwickshire artillery battery, was recently mentioned in despatches. P. C. D. Douglas, just before war broke out, met with a very serious accident, and badly injured his leg. He tried to pass the doctor by all manner of ruses, but was unsuccessful, so he bought a car, became an R.A.C. driver, and did much valuable work. Later he obtained a commission.



MOTOR CYCLING THROUGH THE FLOODS.

Miss Leila Wallis, of Hereford, driving a Norton sidecar outfit through a flooded Herefordshire road. The machine, we are told, came through water up to the hubs without a misfire.

**Sidecars and Accessories.**

Next Thursday, the 27th inst., a special number of *The Motor Cycle* dealing with the above subjects will be published. It will be divided into four sections.

**From an American Contemporary.**

"Whatever tests the seasons send  
Sidecar pleasures never end."

**Spring Frames.**

Our spring frame campaign has now extended to the very ends of the earth, and it is discussed in motor cycling topics of journals published in far-off lands. A design which appears in our letters pages this week comes from Mudros, one of the scenes of the ill-starred Dardanelles operations.

**Average Prices.**

We give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted. If there were not at least two advertisements, then the last occasion on which they were quoted is given.

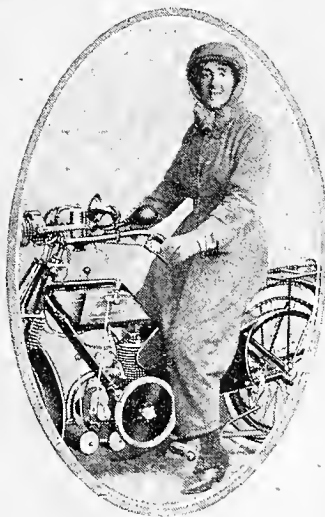
Make.	Year.	H.P.	Average Latest for weekly last average week, obtainable
A.J.S. ....	1915 6	3-sp. sidecar ..	£82
" .....	1914 6	3-sp. sidecar ..	£72
" .....	1913 6	3-sp. sidecar ..	£57
" .....	1915 2½	3-speed .....	£51
Allon .....	1915 2½	3-speed .....	£36
Ariel .....	1914 3½	3-sp. sidecar ..	£53
Bradbury ..	1914 4	3-sp. sidecar ..	£47
B.S.A. ....	1915 4½	3-sp. sidecar ..	£69
" .....	1914 4½	3-sp. sidecar ..	£56
" .....	1913 3½	2-speed .....	£44
" .....	1914 2	2-speed .....	£31
Calthorpe ..	1915 2½	2-speed .....	£17
" .....	1914 6	3-sp. sidecar ..	£30
Clyno .....	1914 6	3-sp. sidecar ..	£63
" .....	1913 6	3-sp. sidecar ..	£50
Douglas ....	1914 2½	2-sp. kick start	£38
" .....	1914 2½	2-speed T.T. ..	£40
" .....	1913 2½	2-speed T.T. ..	£32
Enfield ....	1915 6	2-sp. sidecar ..	£69
" .....	1914 6	2-sp. sidecar ..	£61
" .....	1913 6	2-sp. sidecar ..	£49
" .....	1915 3	2-speed .....	£43
" .....	1914 3	2-speed .....	£37
A. Excelsior	1914 7	2-sp. sidecar ..	£48
H. Davidson ..	1915 7	3-sp. sidecar ..	£62
Indian .....	1915 7	3-sp. sidecar ..	£80
" .....	1914 7	2-sp. sidecar ..	£60
" .....	1915 5	3 speed .....	£53
" .....	1914 7	T.T. free eng. ..	£44
James .....	1915 4½	3-sp. sidecar ..	£75
Lea Francis ..	1915 3½	3-speed .....	£63
Levis .....	1915 2½	" Popular" .....	£25
Matchless ..	1914 8	2-sp. sidecar ..	£70
" .....	1913 8	2-sp. sidecar ..	£53
New Hudson ..	1915 6	3-sp. sidecar ..	£61
" .....	1915 2½	2-speed .....	£30
New Imperial	1915 2½	2-speed .....	£27
" .....	1914 2½	2-speed .....	£26
O.K. ....	1915 2	2-speed .....	£25
" .....	1914 2	2-speed .....	£21
P. & M. ....	1913 3½	2-sp. sidecar ..	£43
Premier .....	1914 3½	3-sp. sidecar ..	£45
" .....	1913 3½	3-sp. sidecar ..	£40
Rex .....	1914 6	2-sp. sidecar ..	£48
Rover .....	1915 3½	3-sp. sidecar ..	£56
" .....	1914 3½	3-sp. sidecar ..	£41
" .....	1913 3½	3-sp. sidecar ..	£40
Rudge .....	1914 5-6	Multi sidecar ..	£41
" .....	1915 3½	Multi .....	£47
" .....	1914 3½	Multi .....	£37
" .....	1913 3½	Multi .....	£29
" .....	1914 3½	Multi sidecar ..	£47
Scott .....	1914 3½	2-sp. sidecar ..	£48
" .....	1913 3½	2-sp. sidecar ..	£48
Sunbeam .....	1915 6	3-sp. sidecar ..	£96
" .....	1914 6	3-sp. sidecar ..	£80
" .....	1915 3½	3-speed .....	£63
" .....	1914 3½	3-speed .....	£52
Triumph .....	1914 4	3-sp. sidecar ..	£49
" .....	1914 4	3-speed .....	£44
" .....	1913 3½	3-sp. sidecar ..	£45
" .....	1913 3½	3-speed .....	£39
Williamson ..	1914 8	2-sp. sidecar ..	£62
" .....	1913 8	2-sp. sidecar ..	£55
Zenith .....	1914 8	2-sp. sidecar ..	£67
" .....	1914 6	2-sp. sidecar ..	£56

**Recruits from Toronto.**

Many well-known Toronto riders have enlisted as despatch riders in various Canadian Corps, and we hear that a dozen more have recently joined the A.S.C., M.T. (British Service), a recruiting branch of which has been opened in Toronto.

**Aero Engines on Motor Cycles.**

Referring to our articles on the subject of aero engines and the influence they might exercise on motor cycle construction, a correspondent tells us that he once saw a Gnome engine fitted to a motor cycle. This was placed in the usual position in the centre of the frame, and was said to develop enormous power, so that steep hills could be taken with the utmost ease. The only drawback was, we are informed, the continuous hum of the exhaust.

**A CASE OF TUNE!**

Miss Florence Eyre, the well-known Covent Garden soprano, on her Royal Ruby two-stroke. This is an instance where rider as well as machine must always be up to concert pitch!

**Motor Cyclists' "Through Routes."**

In connection with the new edition of "The Motor Cycle Route Book," which is now in course of preparation, we invite the co-operation of a number of our readers in ensuring that the routes recommended shall be the best from a motor cyclist's point of view. Various correspondents throughout the country are collaborating in this new edition, but there are certain districts in which we would welcome our readers' advice. Those who have extensive knowledge of the roads in the undermentioned districts would oblige by communicating with the Editor, marking their letters "Route Book," when proofs of the book will be submitted for criticism: (1) East Anglia, (2) North-Eastern Counties, (3) the country south-west of a line drawn from Bristol-Exeter-Lyme Regis, (4) Scotland—north-east and north-west of Aberdeen, and (5) South Wales.

Captains Smith and Davidson and Lieutenant Cadman come in the list we recently published of those mentioned in despatches.

**The Game of Cribbage.**

We are sorry to have caused inconvenience to those journals which copied—without acknowledgment—the erroneous report of the death of Flight-Lieut. Wilberforce. After all, that is one of the risks of piracy.

**1,000 Miles in 1,000 Minutes.**

An American rider, Arthur Chapple, proposes to make an attempt to cover 1,000 miles in 1,000 consecutive minutes (16½ hours) on the new Sheepshead (New York) track. The machine to be ridden is not yet decided upon.

**United States Military Riders.**

As a preliminary step, the U.S.A. Congress has been asked to provide 100 motor cycles for the use of the Army Signal Corps. General Scriven, chief of the Signal Corps, says that his experience has indicated the great value of motor cycle riders in his particular branch.

**A Long Distance Road Record.**

According to a Reuter telegram a few days ago, Erwin Baker, an American rider, covered 930 miles on a motor cycle in twenty-four hours at Melbourne, Australia. Baker left San Francisco a couple of months ago with one of the latest Indians, with the intention of securing all the Australian records he could. He has evidently made a good start.

**Military Cross for Captain Little.**

Captain W. B. Little, 151st Brigade, 60th Division, was mentioned in Sir John French's recent despatch. Captain Little, who is an expert in horticulture and a well-known motor cyclist, is a native of Carlisle. His name appears in last week's list of officers who have been awarded the Military Cross.

**Daily Motor Cycle Exports.**

The average daily exports of motor cycles in 1915 amounted to 30.08. Imports of foreign machines averaged 12.44 per day. The exports could be very greatly augmented if better transport facilities were provided. Why not a little less cocoa and coffee for Germany?

**The National War Funds.**

At the week-end the principal war funds stood as follow:

The Prince of Wales's National Relief Fund	(£2,893,000 distributed)	£25,714,879	0	0
Fund for the Sick and Wounded		3,132,687	0	0
The Queen's Work for Women Fund		168,104	2	3
The Belgian Relief Fund (exceeds)		1,300,000	0	0

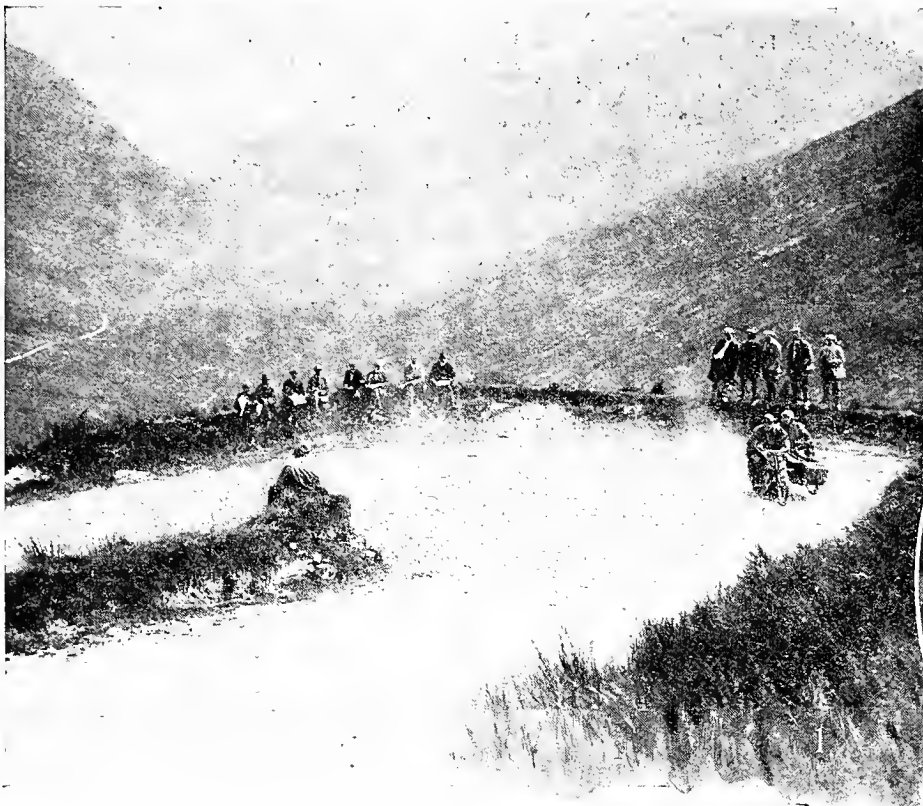
**Rewards for Service in the Field.**

In the list of rewards for service in the field we note the following names: Distinguished Service Order, Temporary Major C. H. T. Byng Hall, M.M.G.S., and Captain A. H. Davidson, R.E.; the Military Cross, Temporary Captain C. M. Smith, Intelligence Corps, Captain H. Blackburn, R.F.C., Temporary Lieutenant E. W. Bennett, M.M.G.S., Temporary Lieutenant Guy Campbell, M.M.G.S., and Temporary Second-Lieutenant C. J. Cadman, R.E., Motor Cyclist Section (S.R.); Distinguished Conduct Medal, Lance-Corporal (Motor Cyclist) C. C. Parrott, Home Counties Field Co. R.E., T.F., and Battery Sergeant-Major B. Stichbury, No. 4 Battery, M.M.G.S.

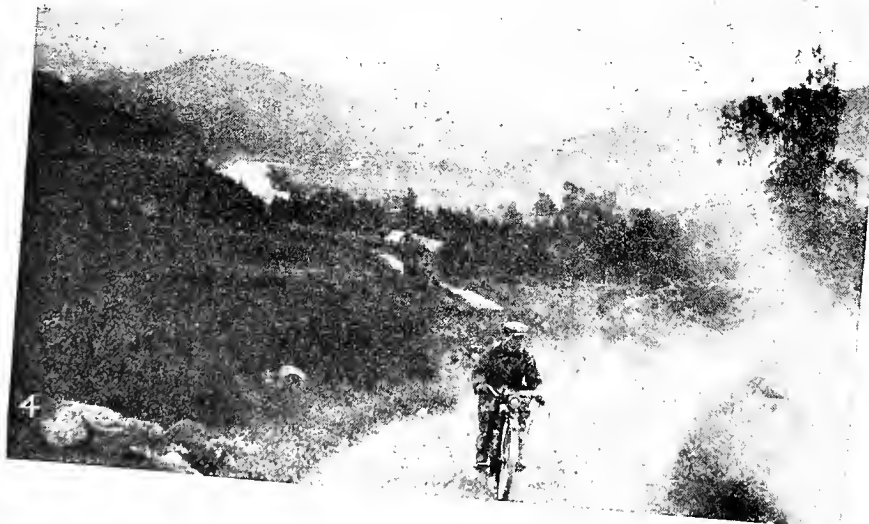
## Scottish T

In which Hills an

What pleasant memories t  
recall! How motor cyclist  
pe



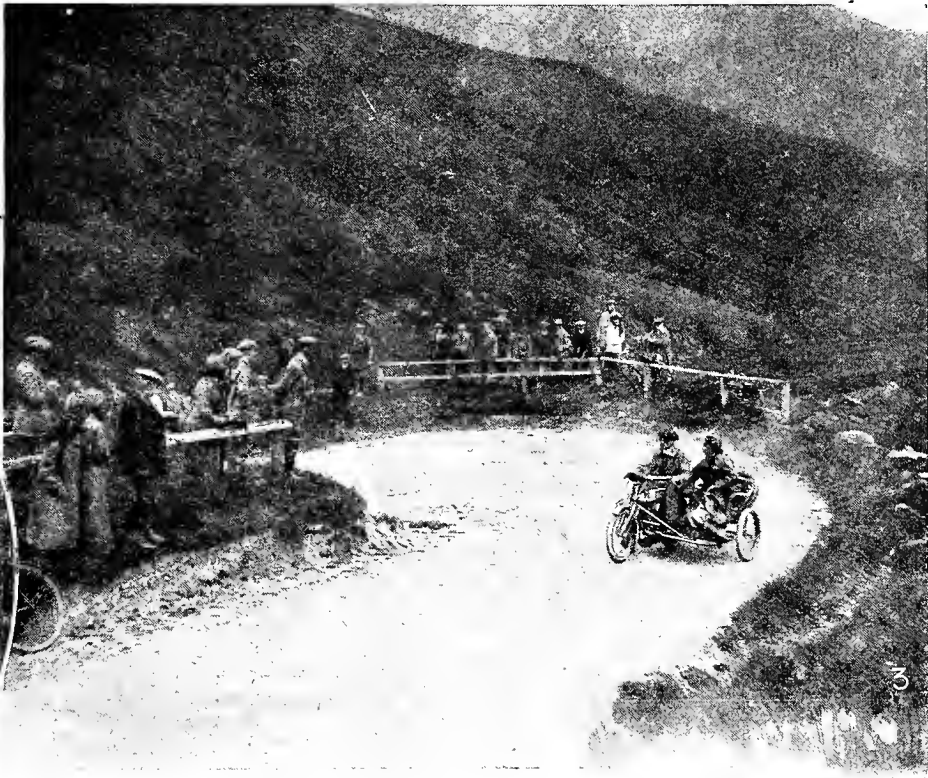
- (1) The last bend near the summit of Rest and be Thankful. The length of this hill, culminating in this severe hairpin bend, was the cause of many failures in the early Scottish trials.
- (2) One of the hairpin corners on Kenmore Hill. This is the opposite side of the famous Amulree, and, owing to the number of acute bends, is considered by many to be much more severe.



# ing Scenes

ins Predominate.

tion of these pictures will  
for the return of com-



- (3) The second bend of the "S" of the Devil's Elbow, the most difficult portion of the road between Glenshee and Braemar.
- (4) A very loose portion of Allargue Brae, locally known as Cockbridge Ladder. It is a long twisting ascent near Balmoral Castle.
- (5) Ascending picturesque Glendoe—a long and tiring climb from Fort Augustus.
- (6) Another view of the lower stretches of Glendoe, looking towards Fort Augustus.





## NEW RECRUITING SCHEME.

10,000 Men for R.F.C.

TEN thousand men are wanted for the Royal Flying Corps as quickly as possible. The system of recruiting is very smartly arranged. An R.F.C. party, consisting of an officer, trade-testing N.C.O.'s and men, with clerical staff, are being stationed in various centres, and men will be tested there and then, and finally approved, lorries, lathes, and such like being included in the party's equipment specially to test the recruits. All Flying Corps tradesmen are required, but particularly fitters, motor transport drivers, instrument repairers, coppersmiths, and storemen (with knowledge of engine parts). The pay in each case is 2s. per day.

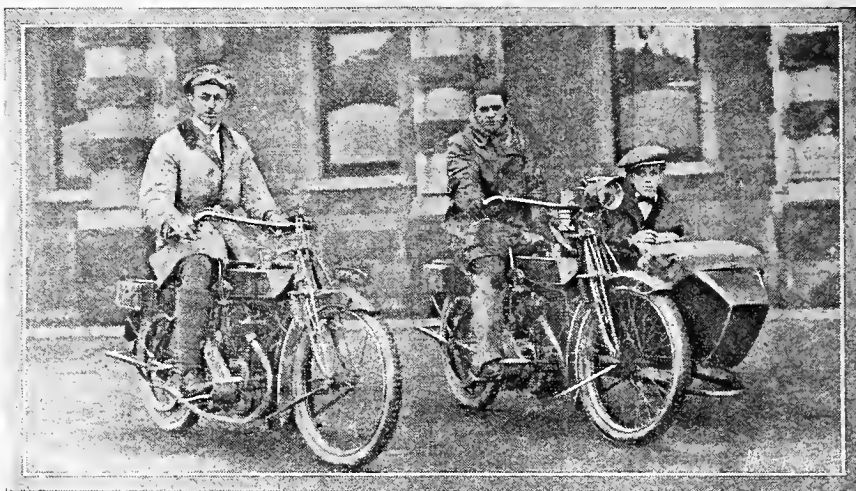
The South Midland R.F.C. party will be stationed at Birmingham from to-day (Thursday) until further notice. Further particulars may be obtained from local Recruiting Offices, but it should be noted that Groups 2 to 5, which are being called up this week, are debarred.

## A DOUBLE SIDECAR OUTFIT.

THERE was recently held in Durban, Natal, a Joy-ride Day, in aid of the Overseas Fund, which was organised by the Natal M.C.C. It was a great success, and over £40 was collected by some twenty sidecar outfits. The idea of the double sidecar illustrated caught the public's fancy, and it was in demand all day long. Two sidecars, it will be noticed, are fitted to a 7 h.p. Indian. This is no novelty, since as long ago as in the issue of July 8th, 1903, on page 320, we published a photograph of a 2½ h.p. Excelsior motor bicycle to which two Millford sidecars were attached in a similar manner.



An Indian double sidecar outfit used by Mr. R. A. Jordan, of Williams, Hunt, and Co., of Durban. The combination took part in the Durban Joy-ride Day, by means of which a considerable amount was added to the local war funds.



## SUCCESSFUL COMPETITORS IN A NEW ZEALAND TRIAL.

F. Drake (3½ h.p. New Hudson) and S. Medder (3½ h.p. New Hudson sidecar), who won their respective classes in the 260 miles trial from Dunedin to Timaru and return on October 29th last. Medder put up the best all-round performance of the day.

## HOLLAND AND AMERICAN MANUFACTURERS.

AS showing the manner in which United States motor cycle manufacturers are obtaining the cream of the Dutch trade now that British machines are practically unobtainable, the following extract from an article in a recent issue of our Chicago contemporary, *Motor Cycling and Bicycling*, is interesting. The article is written from The Hague, and the following is the most interesting extract:

"Yesterday I had a chat with one of the leading motor cycle and bicycle dealers of the city, and as a matter of course the conversation soon came on

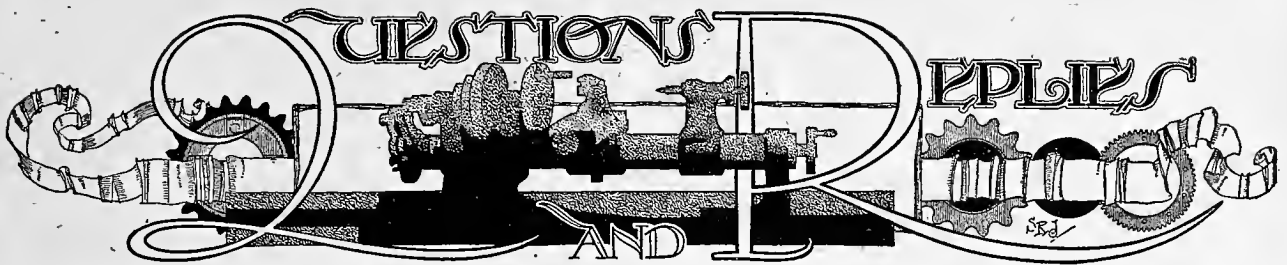
the situation of the motor cycle and bicycle trade in Holland during the war. My man complained bitterly. He told me he could not get the goods he wanted. Before the war he imported a lot of stuff from England, such as bicycles and many other sporting articles. Now he could not get hardly anything he wanted. As a matter of course the bicycle export, and at the same time the motor cycle export, from Great Britain to Holland had completely come to a standstill on account of the war. 'You know,' he said, 'I have no difficulty in selling the goods when I have them, but the big point is in the trouble of getting them.'

"As to the motor cycles, this is not so serious, because the United States are exporting lots of motor cycles to Holland. At present Harley-Davidsons, Indians, Hendersons, and other well-known American motor cycles sell like bread here, and it seems that the Dutch public likes these American makes very well. Before the war we imported English motor cycles, such as the Douglas, or Belgian ones, such as the well-known F.N., but this is out of the question now."

In this connection it is interesting to record that the Dutch Government not long ago placed an order for fifty W.D. pattern 2½ h.p. Douglases.

## FROM A.C.U. TO R.A.M.C.

WE have lately heard from Private F. J. Briggs, R.A.M.C., who until the beginning of the war was a clerk in the competition department of the A.C.U. Writing from France, he says: "I have had the good fortune to ride a Rudge-Multi for a month or so, and can assure you that I thoroughly enjoyed a return to the sport which I like so well. Despatch riding out here is good training for trial work. I can assure you. My best good wishes to the M.M.G.S. I only wish I were among them."



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### A Magneto Query.

(1.) I have put coiled copper wire round my cylinder to assist in cooling. The wire almost touches the magnets of the magneto. Will this harm the magneto in any way? (2.) I have a three-speed hub gear. Can I convert the machine into a chain and belt drive by fitting anything, as the pulley is rather small for direct belt drive? (3.) Can I fit 26in. x 2½in. tyres on 26in. x 2in. rims?—S.P.T.

(1.) This will do the magneto no harm. (2.) We think it would be difficult to convert the machine into chain-cum-belt drive. It would necessitate mounting a countershaft on the bottom bracket. (3.) You can fit 2½in. tyres on 2in. rims.

### Too High a Gear.

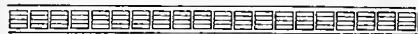
(1.) I have a 1915 5 h.p. Indian. It used to do about 50 m.p.h. on the top gear and about 40-45 m.p.h. on the middle. I have now fitted on to it the standard Indian sidecar. With a fairly heavy passenger and on the level I can get 40 m.p.h. on the middle gear and about the same on the top. The engine generally knocks on the top gear. I am told that the gear ratio is too high. The present ratio is 12, 7, and 4½ to 1. Now, if I get it changed to 5 to 1 on top by putting on a bigger wheel and sprocket I am sure it will remedy the defect. (2.) On no account can I drive the machine at less than 20 m.p.h. on the middle gear even. I have always to use the clutch and brake to hold the machine back. (3.) I can do no more than seventy-five miles on a quart of lubricating oil. This is, too low. What should be the correct figure for ordinary running?—M.R.S

(1.) It is evident that your machine is geared too high on top gear, and you will do much better all round by gearing about 5 to 1. (2.) The 5 h.p. twin does not as a rule run quite so slowly as the 7 h.p. You might try reducing the size of the pilot jet. If this does not have the desired result you might try the tip suggested in *The Motor Cycle* of December 9th, page 591, in which it is suggested that a tap be fitted in the small pipe between the pilot jet and induction pipe. By this means it is said to be possible to throttle the machine down to a crawl. (3.) You should be able to cover about 100 miles to a quart of lubricating oil.

### Coasting in Neutral.

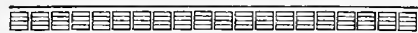
I have a 1915 2½ h.p. two-stroke motor cycle fitted with a two-speed countershaft gear. (1.) Can I use the neutral gear for coasting down hills, provided the throttle has been closed? (2.) Will the engine run freely in neutral? (3.) Is it advisable to give the engine a pumpful of oil on starting up from cold or simply allow the drip to work, as the exhaust smokes for some little while on starting after giving a full pump?—B.G.B.

(1.) You may use the neutral gear for coasting, but we should not recommend you to make a habit of doing this, as it is sometimes difficult to get the gear into engagement again. (2.) The engine certainly runs freely in neutral, but, of course, a gear of this kind cannot be made use of for starting the machine from standstill. (3.) If you have reason to suppose that there is not sufficient oil in the engine you may give it a pumpful before starting. The fact that the exhaust smokes seems to indicate that there is rather too much oil in the engine.



## NEXT THURSDAY!

### Sidecars and Accessories.



### Magneto Parts.

Will you please let me know (1) the object of the small carbon brush at the back of the "make and break" of my Bosch magneto, as it does not seem to make much difference whether it is in place or not? Also (2), is the small flat spring that presses the pivot of the rocker arm merely to keep the rocker arm in its proper position?—L.L.

(1.) The small carbon brush to which you refer is the condenser connection, and, while the magneto will still continue to spark if this brush is removed, if it is removed there is violent sparking at the contact breaker points, causing rapid pitting of the platinum. (2.) Yes, the small spring referred to is simply to keep the rocker arm in position.

### Firing on One Cylinder.

I am thinking of buying a motor cycle second-hand. The machine in question is a 1913 5-6 h.p. Indian, overhead valves and automatic carburettor. Only one cylinder (the rear) fires until a speed of 30 m.p.h. is attained on the top gear, but when on the stand and a bit warm both cylinders will fire. The valve timing is correct and the contact points open at the right time. The pistons and bushes are in good order, and no leaks in the carburettor.—W.B.

The fact that the machine will only fire on one cylinder need not necessarily be a serious fault; it is far more likely to be due to some simple cause. The timing is easily tested, and if it fires all right on one cylinder it is not likely that the timing is wrong. However, you might test it. The exhaust valve of each cylinder should close directly the piston reaches the top of its stroke. If this is correct in both cylinders the other valve timings will also be automatically correct. The contact breaker points should separate when the piston is on top, with the ignition half advanced. The most likely cause of the machine not firing on one cylinder is that there is an air leak in the induction pipe between the carburettor and engine. Try hindling all joints with adhesive tape. Also fit a new plug.

### A High Compression.

I have a 3½ h.p. 1910 single-cylinder, and after running a few miles at a fair pace it is very inclined to knock, unless I frequently remove the cylinder and clean the carbon deposit from the cylinder head and piston. Otherwise the machine runs well and is very fast. I have been told this is due to too high compression. If this is so, how can I best remove the trouble?—A.H.

It is very possible that the trouble is caused by a high compression. There are several ways of overcoming it: (1) By inserting valve caps which have been turned hollow on the inside; (2) by fitting a washer ¼ in. to ⅜ in. thick under the cylinder, taking up the extra clearance between the valve tappets, if not adjustable, by means of tappet adjusters. A piston which is slightly shorter from top to gudgeon pin centre would also have the same effect.

**SPECIAL NOTICE.**—Copies of "The Motor Cycle" may only be sent to neutral European countries if posted direct from the offices of the publishers, or by newsgents who have obtained permission from the War Office for this purpose. The publishers of "The Motor Cycle" have obtained the necessary permission, and, consequently, can send subscribers' copies as usual. Before sending through newsgents it is important to enquire if permission has been obtained, as otherwise copies intended for neutral European countries will not be forwarded by the Post Office.

## Noise in Engine.



I have had my mount—a 2½ h.p. two-stroke—just twelve months, and up to a fortnight ago I have experienced no engine trouble whatever, although I did a good five hundred mile tour last August. About three weeks ago a bolt came loose in the magneto end of the magneto chain, and naturally the timing was altered and I came to a standstill. I had the timing adjusted, but since then the engine has developed a peculiar grating and knocking. I took the engine down, and had the big end seen to and tightened up, but this grating noise is now worse than ever. I have also noticed that petrol drips out of the tap under the crank case, which indicates, of course, that the petrol must be getting down between the piston and cylinder. I should be extremely pleased if you would inform me of the cause of the knocking or grating noise; how to effect a cure; and how to stop the petrol from getting between the cylinder and piston.

—D.C.B.

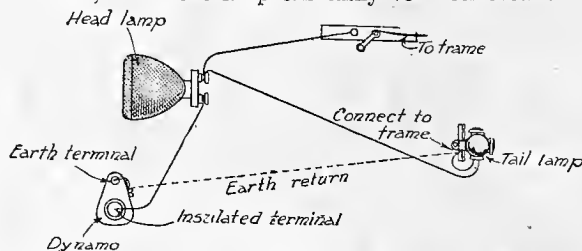
It is very difficult to say what is the cause of the grating in your machine, but as it developed after the timing slipped it rather points to the fact that the timing has been reset in the wrong position, probably too far advanced, causing knocking. It is curious that you should get petrol in the crank case; it would seem as though the carburetter is flooding, and so admitting pure petrol to the engine instead of petrol vapour. You should make sure your carburetter is in good order and not flooding. If petrol is so prevalent in the crank case it is possible that this is the cause of the grating, owing to it impoverishing the lubricating oil, and you should try and find out where it comes from; it is not likely that it passes the piston. Make sure the piston and cylinder are free from carbon deposit, and that the top piston ring is not stuck in its groove. Also make sure the bolt that became loose is not projecting too far and rubbing against the casing.

## READERS' REPLIES.

## Magneto Lighting Set.

In the issue of *The Motor Cycle* for December 23rd, I notice "C.G.C.," on page 643, is having trouble with his Dynalite lighting system. Perhaps my experience of a similar system, namely, the Voltalite, may be of use to him. Since the beginning of October I have used electric light every morning and evening going and returning from my work, and have not been troubled by a bulb fusing, even at 40-45 m.p.h., which speed should satisfy most people in the dark. As is rightly stated in the reply, a higher voltage lamp would remedy the trouble, and a poorer light would be obtained at slow speeds, yet even this can be removed as follows: I make the dynamo run the rear light as well as the head light, and connect two low voltage lamps in series for this purpose. I find two 3.5 bulbs in series are very suitable, as the voltage required to light these effectively is  $3.5 \times 2 = 7$  volts, which is about the voltage given by the dynamo. Then at slow speeds, by means of a handle-bar switch, I "short" the rear

light, thus putting the efforts of the dynamo entirely through the head light. I append a sketch of the simplest wiring. If both lamps have one terminal "earthed," then one lamp can easily be



Wiring diagram to illustrate reply from W. U. Dykes, published on this page.

insulated from the frame. I have the head light insulated from the frame. The earth terminal of the dynamo is just screwed to the outer casing, and does not require to be used. Thus only three wires are used—one from the dynamo to the head light, the head light to the tail light, and the switch wire. Twisting the wire into a spiral before attaching to the terminal will make the connection infinitely more durable.—W. U. DYKES.

## Loss of Power.

The question asked by "H.J.M." in *The Motor Cycle* of January 6th reminds me of a similar experience with my 6 h.p. Royal Enfield some six months back. Every working part seemed to be in excellent going order, but the running was listless and dead. Full throttle, spark retarded, and low gear would give temporary relief, postponing for a moment the inevitable full-stop. Starting was extremely exhausting, as until I was tired out I got nothing but a sequence of half-a-dozen

explosions, a grunt or two, and then silence. I could find nothing wrong with the machinery anywhere, simply because nothing was wrong, but as I had removed almost every available nut I included the waste oil cap, and here lay the cause of the trouble. The machine had exhibited no sign of over-oiling, shown no smoke at the silencer, nor did it blow oil about, yet after letting out this oil a miracle seemed to have given life and power to the machine. Three times has my machine shown these symptoms—and the remedy has acted like magic.—H.A.H.

## EXPERIENCES WANTED.

"J.G." (Northants).—Revere. Reliability, efficiency, and speed.

"R.J.H." (Walsall).—Dalm. Speed, hill-climbing, reliability, consumption, and ease of starting.

"Persevera" (Liverpool) and "E.K." (Bradford).—Grado pulley for sidecar,

## RECOMMENDED ROUTE.

GILLINGHAM (KENT) TO NEWCASTLE-ON-TYNE.—F.R.B.

Gillingham, Gravesend, ferry across Thames to Tilbury, Ingrave, Brentwood, Chipping Ongar, Harlow, Bishops Stortford, Newport, Cambridge, Godmanchester, Huntingdon, Stilton, Stamford, Grant-ham, Newark, Tuxford, East Retford, Bawtry, Doncaster, Wentbridge, Ferry-bridge, Aberford, Wetherby, Borough-bridge, Leeming, Catterick, Scotch Corner, Barton, Darlington, Ferryhill, Croxdale Station, Farewell Hall, Neville's Cross, Chester-le-Street, Gateshead, Newcastle. Approximately 300 miles.



## A SIDECAR TO THE RESCUE.

A sidecar towing a broken down light lorry carrying 5 cwt. of goods and five men. The machine is a single-cylinder 4½ h.p. Excelsior.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

#### The Pay of Army Motor Cyclists and Car Drivers.

Sir,—I have just seen your article in *The Motor Cycle*. Now, I am a 6s. a day man, and enlisted on October 13th, 1914, and on October 17th, 1914, was on the way to France, as I was an expert driver, and I can tell you, from experience, there are no soft jobs out there. I earned all I got.

Now, what I do not hold with is this, and it is time something was done. I came home wounded on June 3rd, 1915, and was in hospital till I went to Aldershot on August 6th, 1915. I am now marked unfit (I have defective eyesight) and have been drawing my 6s. a day since for nothing. That is where the money is wasted. Also in this camp there are others who have done nothing since August.

Lark Hill.

S.T.C.

#### The Lighting Regulations.

Sir,—Now that the new lighting regulations are in force there are many complaints to make. About three months ago most people were grumbling about the various local requirements, and they asked the Home Office to make some general order. The Home Office has made an order, but it is far from perfect.

The drivers of our (M.M.G.S.) cars are fairly active on their feet, and I am certain they will be more active very soon, as on the way from Bisley to Brighton, or any place you like to mention, so many changes in discs and paper have to be made. I was pulled up the other day by a village constable, who said my lights were too bright. The car I was driving was a Studebaker, and I had three coats of white paint on the glass, and I could have seen better with a match than with the "lights" I was using.

Another question to be raised is, how can the police prevent us from brightening our lights when we are out of the towns? The police in this part of the country (Surrey) are very down on the military, but, speaking from what generally occurs, they are often "strafed" in their efforts.

H.J.C.

#### British Machines for British Riders.

Sir,—After reading the letter from W. Cartwright it was a welcome change to turn to the letter from "Penrot" and find there was still some patriotism left in England, for one is inclined to doubt it when reading Mr. C.'s letter. Does that gentleman know the first thing about national economy? Apart from that it augurs ill for your policy of patronising British trade after the war, when such sentiments are expressed when our nation is in the hour of her agony. I suppose Mr. C. would buy a German cycle if he could get one for £60, then make the excuse that "the poor German is not so bad as he is painted, and we must have the cheapest article." The very creed that has almost damned this country!

Pardon my heat, sir, but if Mr. C. had worked with me for the last sixteen months among the wounded and dying he would have found that there are still some men (working men) left who value their country more than a paltry £10 or so, and have proved how they value it by what they have given for it. My best thanks to "Penrot" and "Cuckoo" for sentiments expressed.

CORPORAL (R.A.M.C.).

Sir,—I notice a letter in *The Motor Cycle* of January 13th from "Penrot." He has my sentiments down to the ground. It has taken this war to make the British public see straight.

I think we are beginning to see that Free Trade is not always for our good, seeing we have now a 6s. 8d. per £1 tax on imported machines, and imposed by a Liberal Government. The British public and British manufacturers must see that other Continental countries do not get the trade before it is too late. A NINE YEARS' READER.

Sir,—"Penrot's" patriotic prattle evidently comes direct from the heart. Sentiment is very nice, and it is fine to soar away far up into the blue ether, but we must always return to the common facts of earth.

I am a buyer of a high-powered twin sidecar combination, and, after due consideration, I have ordered a Yankee outfit. In doing so I consider I am performing a fine service to my country for the following reasons: Firstly, the British manufacturer does not want my order; he has as much work on hand for the Government as he can manage. Secondly, he cannot take my order without taking men off Government work to deal with it. Thirdly, when buying a foreign machine, 6s. 8d. in every £1 goes direct into the British Exchequer. If the order were placed with a British firm the Exchequer would only receive the income tax on the net profit—an amount, probably, only one-tenth of the Customs import duty on my machine. WOTS WRIGHT.

#### A Tip for Hub Gear Users.

Sir,—We notice in your issue of December 30th, 1915, a most interesting account of the journey into Kashmir on a motor cycle fitted with a Sturmey-Archer gear, over the initials "C.A.T."

We see that your correspondent had the misfortune to break off the adjustable gear rod, and was apparently under the impression that this rendered his gear useless as regards the second and top gears.

A useful tip under such circumstances would be to wedge up the bell crank lever at the left-hand end of the axle with anything convenient, such as a chip of wood. This may be quite easily removed when necessary to drop into low gear, and should therefore occasion very little delay in arriving at a place where a permanent repair was possible.

In the hope that this tip may reach your correspondent, and be useful to him as well as to other riders of Sturmey-Archer gears.

STURMEY-ARCHER GEARS, LTD.

#### Despatch Riders and the Groups.

Sir,—Being a regular reader of your very interesting paper, and seeing a note in your issue for December 30th concerning the recruiting for despatch riders in the R.E., I thought I would write you *re* the above.

I offered my services some time ago, and was instructed to report at Bedford to undergo the proficiency tests. This I did at considerable expense to myself, and after passing the tests I was informed that I should be called up in a few days. A few days later I received notice telling me I should not be required until the beginning of January. This was in November, and on December 30th I received a postcard as follows: "Instructions have just been received that candidates for the Motor Cycle Section of the E.A. area cannot now be accepted for the month of January until further orders."

This, to me, seems very unsatisfactory. Of course, I am content to wait my turn, but having attested under Lord



Derby's scheme, I am wondering what consideration I and many other motor cyclists on the various waiting lists will receive when called upon to report with the groups. It seems very unfair that men who have offered their services quite voluntarily for a branch of the Service in which they feel they will be able to do most for their country, and who have in many cases gone to considerable expense to show their proficiency, should be obliged to enlist in something entirely different. I think I shall be quite right in assuming that there will be a good demand for D.R.'s later on even if there is no demand now.

I am sorry to trouble you with such a long letter, but think I am expressing the feelings of many fellow motor cyclists on the various waiting lists.

C. LARWOOD.

[We refer our correspondent to page 38 of our last issue.—Ed.]

### Footrests v. Footboards.

Sir,—I notice "Ixion" expresses his preference for footrests to footboards. I wish to venture the opposite opinion, both on the grounds of comfort and protection for the engine in case of accident. I have removed the footrests and pedalling gear from my machine, and replaced them with a pair of long footboards. I did this because I found that my legs became stiff and cramped after a long ride, owing to their being kept in one position. Also when I had a spill invariably one of the footrests was broken off, and on one occasion the exhaust valve lifting gear was "rubbed off" the crank case also. With the footboards, however, practically no damage results, the most being one of the boards (which are made of wood covered with rubber) being split. This was easily replaced with a piece of wood from a petrol case.

I know this is a matter of personal preference, but I should have footboards every time. The boards I like best on a machine are those on the Douglas and Enfield.

I have been taking in *The Motor Cycle* for about two years now, and am greatly interested in the motor cycle despatch riders' work. There are none wanted in connection with the N.Z. Expeditionary Force or I would have tried to join that branch. As it is I have had to be content with the infantry, and am leaving for the training camp in about a month's time.

J. BURT.

Invercargill, N.Z.

### Two-stroke Lightweights—A Criticism.

Sir,—I have a 1915 lightweight machine (Revere), and was interested in the article on lightweight models in your issue of December 30th. It is true they get splashed and soaked all over in bad weather, but I have ridden this machine during the past few weeks in pouring rain with no trouble or ill-effects. I wash it down like a car each time it is out, and then every bolt and nut and working joint, etc., is scrubbed with Gishurstine with a toothbrush to prevent rust, after first being well dried, and the Gishurstine grease is allowed to remain on. This is very good and effective where wet and rust are concerned.

I find it a particularly smooth-running cycle with a nice even hum, except for a rattle in the engine, which I cannot account for unless it wants cleaning. I keep all parts thoroughly clean outside, but am a novice where mechanical work is concerned.

IGNORAMUS.

Sir,—I should like to endorse "All Weather Rider's" statements *re* mudguarding. My machine is a 1916 two-speed countershaft model. After going through the same experience as "A.W.R.," I decided to fit a flap on the front guards similar to the B.S.A. Since then "I have used no other," and the trouble is completely cured. As regards the coil brakes, I find them quite efficient if used gradually and oiled according to directions. One great source of annoyance to me was the carburetter. It was continually being choked with filings, etc. I took it down about eight times, and now seem to have cured the trouble.

It seems impossible to fix the change gear lever securely for more than two or three days at a time. My petrol consumption is about 90-95 m.p.g.

A.O.G.

Sir,—In 1913 and 1914 a leading firm or two made a departure from what had hitherto been no more than pedal cycle mudguards with side valances by increasing the width of the mudguard, even to making it wider than the forks and adding side wings of considerable extent. This is the best manufacturers have done up to to-day; but a moment's thought will prove it cannot be entirely efficient. Now let us see what happens upon a run in mud. The wheel, upon entering a puddle, violently throws the water and mud upwards and outwards very wide; before it has time to drop the machine and rider run into it. The remedy is a mechanical one, which is not to permit the evil by going straight to the seat of the trouble—the spot where the wheel touches the ground—and trap the mud. Even then there are minor troubles to see to, such as mud blown back from the top of the wheel and mudguard, which the "standard" mudguard and the improved form cannot deal with.

We state that a motor cycle can be made a perfectly clean vehicle, one which can be ridden over all roads at any time of the year and permit the rider to enter a house by the front door with boots clean enough to make the rider a welcome visitor.

Another of your correspondents of the 6th—Sergt. Benfield, R.E., in France—writes: "We have good engines, frames, and wheels," and asks for protection from cold and wet. Evidently the soldier is looked after no better than the civilian; but the civilian has the remedy in his own hands. He has but to select the machine he fancies and let the makers know he buys only if it is fitted with efficient mudguarding.

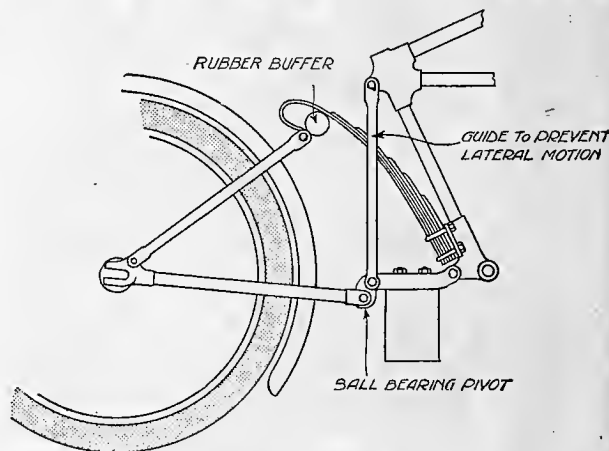
KUMFURT MOTOR CYCLE & ACCESSORIES CO.

F. WAIGH.

[The exigencies of space have compelled us to delete several paragraphs from the above letter. Correspondents are asked to remember that brevity is a virtue.—Ed.]

### Spring Frame Design.

Sir,—I enclose a sketch which I have made for a new design of spring frame. I have not inserted any details at all, but I believe the principle is clear. I should be glad to have any criticism of it, and to know whether it would be of any practical value. I may say that it is designed for an 8 h.p. twin Campion. I find that with the



pivot arranged according to sketch the change of length of chain is negligible. Of course, only a chain guard could be fitted, not a proper chain case unless it was specially designed for the purpose, but I am an advocate of a semi-exposed rear chain.

I may say that my experience since joining the Army has convinced me that spring frames will become standard on all but lightweight machines.

WALTER LAFFAN (CORPL. R.E.)

B.M.E.F., East Mudros.

[The design appears sound, but is not novel. The method of controlling lateral play seems to be placed in the position where it is least wanted. The rubber buffer should be inside the bend of the spring.—Ed.]

### Some Fads and Fancies.

Sir,—I have read with great interest the article "Some Fads and Fancies" by Captain A. Lindsay, M.B., in your issue of last week, and am very pleased to notice therein his graceful expression of testimony to the satisfaction he has derived from the use of my three-jet carburettors on his different machines.

His criticism of the carburettor levers, in the same article, is also interesting. In this connection I am happy to say that we have recently been able to effect considerable improvement in these fittings, and are now producing a lever which works wonderfully smoothly and in which any tendency towards wire breakages has been eliminated.

Allow me to add that I wish to be untiring in my efforts in the direction of perfection, and that I equally appreciate commendation and criticism coming from such a distinguished amateur and authority as Dr. Lindsay.

C. BINKS, Managing Director.

### Tyre Repairs.

Sir,—With reference to "Road Rider's" article and the replies received by you thereon, we shall be much obliged if you will allow us space to clear up certain points that have arisen.

Respecting the stud itself, the top has been shaped at different angles to suit the various sizes of studs for two particular reasons, viz.:

- (1.) So that when solutioned the whole surface, being equally exposed, can dry properly, and
- (2.) When pressed down it will immediately draw up the inside portion to grip the tube as in a vice, irrespective of the air pressure in the tube itself.

Mustikon studs will stretch equally in all directions with the tube, and always retain the original curve of the tube. In view of the vice grip mentioned above, due to the angle of the top cup, the inside disc must seal the aperture, and in fully 90% of repairs it actually permanently adheres to the inside of the tube, but we would point out that if the puncture is cut to the exact size of the template (neither smaller nor larger) on the base of the stud it is immaterial whether the inside disc adheres or not, as the angle of the top flange is so calculated that directly it is pressed down it takes the curve of the tube and automatically draws the inside disc to the same curve. This (irrespective of the air pressure and the fact that the hole is completely filled by the neck of the stud) absolutely prevents any air from escaping.

It is possible to fit the stud dry, and the air pressure from inside, combined with the pressure of the outer cover on the outer disc, will make an air-proof repair. When pressing down the outer disc it should be done from the centre outwards, when no air can possibly remain between it and the tube.

With reference to the remarks on page 660: Should it be necessary to pass the stud through two or even three thicknesses of rubber, this can be done easily and satisfactorily, the only result being that a small portion of the centre of the top flange is sucked into the hole, but the remainder can be pressed down, forming a perfectly sealed repair. Our own repair department frequently has to pass No. 1 studs through three thicknesses of a stout tube.

"Batite" mentions the outer cover, and in this direction we have several advices from users that they have made repairs with the stud in the outer cover which have successfully carried them home, one user stating that he had travelled as many as 500 miles with a Mustikon stud in the outer cover.

MUSTIKON, LTD.

### Varying the Power of Electric Lights.

Sir,—With reference to the letter by "W.K.O.M." appearing in the issue of December 23rd, although the switch gear he suggests for putting the head lamp and rear lamp bulbs in series or parallel at will is ingenious as such, this method of dimming is only satisfactory where pairs of bulbs of equal candle-power are used, as, for instance, in the case of car head lamps or side lamps.

The reason for this may be found in the fact that the "voltage-drop" through lamps in series (neglecting temperature corrections) is inversely proportional to their candle-power when in their normal position, i.e., in parallel. To take a typical case where a head lamp of four volts two amperes

and a rear lamp of four volts .4 ampères represent the normal lighting load. When the lamps are put in series the total resistance will be twelve ohms, and the current through both lamps consequently one-third of an ampère. The voltage at the lamp terminals will, however, now be 3.33 for the rear lamp, and only .66 for the head lamp.

Verb. sap.

A method well tried by the present writer during the past two years, and perfectly satisfactory where considerable dimming is not objected to, is to divide the battery where the two cells are bridged and insert a "series-parallel" switch of the orthodox type, so that one can get either two volt or four volt without risk of disturbing the balance of charge between the two halves of the battery. This condition is very difficult to rectify when once set up, and is a great argument against the adoption of the selector type of switch, which only makes use of one side of the battery when dimming. Naturally, the system given above can only be applied to a four volt or eight volt battery, and not to a six volt one.

Referring to a further letter on this subject in *The Motor Cycle* for December 30th, "X.Y.Z." is quite correct in saying that a dimming resistance should not be inserted in the dynamo circuit, but the reason he gives for this and the phenomena he foretells, should this mistake be made, will cause amusement to those conversant with dynamo design. In the case of nearly all dynamos designed for vehicular use a very sloping "external characteristic" curve is usual. Thus a six volt dynamo will frequently give a voltage of fifteen volts to twenty volts at normal speed if the connection to the battery is severed. As a break in this circuit is equivalent to inserting a resistance of infinite magnitude, it follows—and, of course, can be readily proved—that the effect of inserting a resistance in the main circuit between dynamo and battery will raise and not lower the dynamo voltage. There is a further reason which involves the application of "Ohm's law," but the above argument will perhaps bring conviction without labouring the point at issue.

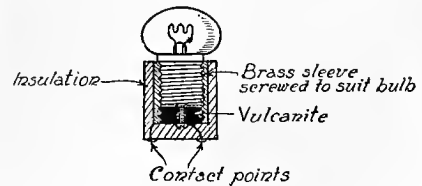
It seems a pity to squash the rather pretty theory "X.Y.Z." puts forward, for it obviously contains the germ of a good idea for electrical self-starters.

G. E. NORTLEY.

Sir,—I have been much interested in the articles which you have recently published on the lighting of the light-weight. In my own case I have a daily journey of 6½ miles each way along dark and narrow country lanes which are within a reduced lights area, but where a good light is essential for the safety of myself and others.

After having used acetylene for years, I have successfully discarded it for electricity, and I nightly rejoice at having abolished "messiness" and "waiting for the smell."

A neat wooden case secured to the top tube of my two-stroke contains a 20 amp. 4 volt accumulator. This lights a .4 amp. screw bulb in the head lamp and a similar bulb in the tail lamp. The head lamp is constructed to take the small size bayonet cap bulb, but, having procured a broken bayonet cap bulb, I broke out the glass and pitch and modified it so that it would take an ordinary flashlamp bulb (see sketch).

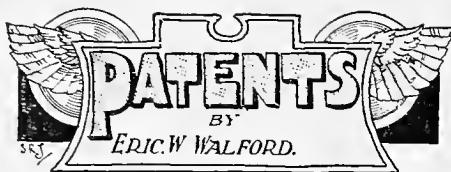


The focus of the lamp being readily adjustable, I can

obtain a wide suffused light for foggy nights, as suggested by "Auriga," or a long beam, by which I have been able to read the inscription on a penny when standing 35 yards from the lamp. The lamp holder itself is secured in the lamp by a bayonet cap fastening, and a sufficient length of cable is supplied to allow it to be held to any part of the machine should a repair be required at night.

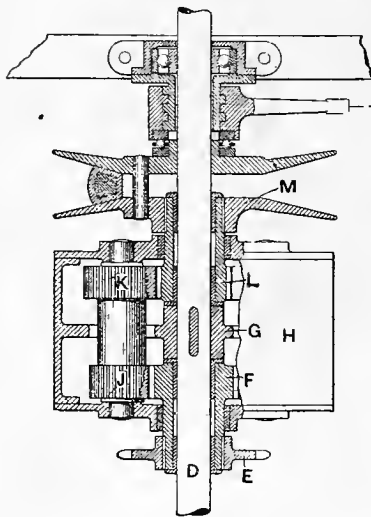
The accumulator has given no trouble so far. I charge it once a fortnight, though it will actually last for three weeks when used for twenty-five minutes every night. The bulbs have given no trouble. If the one in the head lamp fails, that in the tail lamp can be borrowed to get home with.

ALLON.



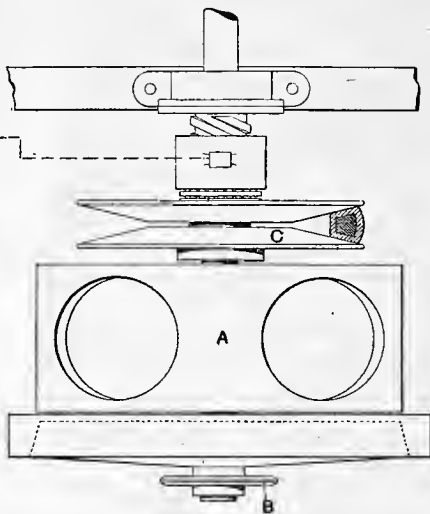
### An Interesting Variable Gear.

By this mechanism it is possible to obtain a gradually variable gear ratio, together with a neutral position and a reverse. The engine crank chamber is shown at A, and the engine-shaft carries a chain sprocket B on one side, whilst on the other it has mounted upon it a belt pulley C. Parallel with the engine-shaft is a countershaft D, which is solid throughout its length, and has mounted



upon it a chain sprocket E, driven from the engine sprocket B. This sprocket E is carried on a sleeve free to rotate on the countershaft, and integral at its inner end with a spur pinion F. Next on the countershaft is keyed the boss G of a housing H, which carries the bearings of one or more short shafts which are formed in one with planet pinions J and K. The pinion J meshes with the pinion F previously mentioned, whilst that lettered K gears with a pinion L, carried on a revoluble sleeve, the outer end of which has mounted upon it a second variable pulley M. The outer faces of both pulleys C and M are adjustable by means of the screw thread devices shown, and are coupled up by a mechanism whereby as one pulley is opened out the other is closed, affording a variable speed ratio. So much for the construction. Now to deal with its operation. First of all assume that the pinions F and J have thirty and eighteen teeth respectively, whilst those of K and L have twenty-four teeth each. Assume also for a moment that the belt is removed from the pulleys CM, and that the chain sprocket E is driven from the engine at the rate of 675 r.p.m. The drum H being stationary, the effect will be for the drive to pass through the pinions F, J, and K, rotating the pinion L at a speed of 1,125 r.p.m. Now assume the belt to be placed on the pulleys CM, and an adjustment arrived at which rotates the pinion L at the rate

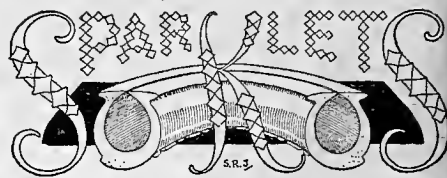
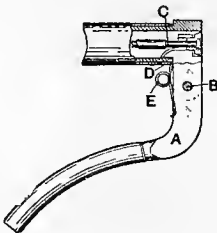
of 1,125 r.p.m. whilst the pinion F is still rotating at 675. The pinions JK will be rotated, but there will be no tendency to rotate the housing H and countershaft D. If now the variable pulleys be adjusted to rotate the pinion L at the same speed as the pinion F, it will be impossible for the pinions J and K to rotate on their axes, and they will be carried round with the pinions FL, revolving the housing H and countershaft, and providing a "solid," or direct drive. Now, it will be understood that between the neutral and solid drive positions there will be an infinite gradation during which the pinions L and F will revolve at different speeds. When the pinion L rotates at a lower speed than the pinion F the drum and counter-



shaft are rotated in a forward direction. If, however, the pinion L runs faster than that, F, the relative dimensions of the pinions F, J, K, and L provide a reversal of rotation of the housing and countershaft.—C. H. Ingall, No. 6,850, 1915.

### A Bowden Lever Improvement.

In Bowden mechanism the operating wire usually actuates some device (an exhaust valve lifter, for instance) which is provided with a spring which keeps the wire in tension, and the tension of the wire in turn holds the operating lever stationary up against a stop. After use, however, the cable may stretch, with the result that the lever is not securely held, but is allowed to chatter. The illustration shows an inverted lever A, pivoted at B, and actuating a cable at C. At D is shown the stop against which the lever should rest, and in order to prevent chattering of the lever a special spring E is provided, which presses the lever up against its stop, irrespective of any other spring acting through the cable. Thus, if the cable should stretch, the lever A is securely held by its spring E.—H. A. Lamplugh, No. 20,124, 1914.



### F.R.S. Lamps in Dublin.

Wayte Bros., of Lemon Street and Duke Lane, Dublin, have been appointed Dublin and district agents for F.R.S. lamps.

### Armstrong Gear Parts and Repairs.

Another firm able to undertake repairs to and supply spare parts of Armstrong gears is the County Cycle and Engineering Co., of Hounslow, Middlesex.

### Name and Address Wanted.

The secretary of the A.C.U. has received a subscription from a member in Newcastle, but as he does not sign his name a receipt cannot be sent to him. He is therefore requested to communicate with the secretary if this paragraph should catch his eye.

### New Everest Address.

Mr. Ernest P. Everest, maker of the Everest carburetter, has removed to new premises in High Street, Newport, Salop, where a section will be devoted to the repair of all types of vehicles in addition to the regular carburetter business.

### M.L. Magneto Booklet.

We have received from the M.L. Magneto Syndicate, Ltd., a most useful engineers' wallet, with pouches at the end containing calliper and folding steel rule. The pocket book contains more than the usual amount of data crammed into these extremely handy works of reference.

### A Good Tyre.

We have had a Cann motor cycle tyre in occasional use for about three years. The mileage stands at about 2,500, and last week it suffered its first puncture through the agency of a nail. The ribs are only partially worn down, and both rubber and canvas are in excellent condition.

### Goodyears in Dublin.

We understand that Messrs. the Goodyear Tyre and Rubber Co., Ltd., have found it necessary to open a depot at 182, Great Brunswick Street, Dublin, in order to cope with their Irish business.

### Review.

"Faults and How to Find Them." (Iliffe and Sons Ltd., 20, Tudor Street, E.C. 2s. 6d.) This book may be said to be a companion to the well-known motor cycle handbook, "Tracing Troubles," since both are arranged in much the same way. "Faults and How to Find Them," however, deals with motor cars, and is a book which should be of inestimable value to the owner of a car, whether light or otherwise. No fewer than 200 possible faults are mentioned, together with the best means of putting each right, so it can be clearly seen that the subject has been dealt with in an efficient manner.



"DE LUXE" pattern tread.

# CLINCHER JUNIOR

MOTOR CYCLE  
TYRES are specially  
made for the  
increasingly popular 'LIGHTWEIGHT.'

Such machines do not require heavy cumbrous tyres but those designed for the purpose which are both durable and reliable.

Flexibility is essential for comfort, and strength is essential for reliability.

Clincher Junior Tyres are designed for—not adapted to—lightweight machines, and they possess real strength both in the casing and on the tread, while owing to the singular method of manufacture they are very resilient, and therefore render comfort to the rider and protection to the machine.

FOR  
RELIABLE SERVICE  
FIT

# CLINCHER

## MOTOR CYCLE TYRES.

THE NORTH BRITISH RUBBER CO., LTD.,

169, Great Portland Street, LONDON, W.

Factories—Castle Mills, Edinburgh.



# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.**, and crossed **& Co.**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pay carriage one way. For all transactions exceeding 10 in value, a deposit fee of 2s. 6d. is charged, when under 10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### A.J.S.

A.J.S. 1916, 2½ h.p., £58.—Turpins, 22 and 29, Prentice Rd., Brighton. [0716]

1916 4h.p. A.J.S. in stock, £76; sidecar to suit, 15 gns.—Cross, Agent, Rotherham. [X9457]

A.J.S. 1916.—All models quite ready for immediate delivery; no waiting.—Moss, Wem. [X9530]

A.J.S. 1915 6h.p. Combination, run 1,000 miles; offers.—Box 9,924, c/o The Motor Cycle. [X9381]

A.J.S. 1916 2½ h.p. 3-speed Models in stock; £58.—Marston, 26 and 31, Bridge St., Chester. [X9500]

1913 6h.p. A.J.S. Combination, with tools, etc., not been used during the war; £40.—F. M. Wallace, St. Malo, Queen's Rd., Aldershot. [X9357]

A.J.S., 1914, 2½ h.p., 2-speed, clutch, kick starter, trip speedometer, lamp, horn, splendid condition; £45.—Moore, 50, Ramshill Rd., Scarborough. [8795]

1915 6h.p. A.J.S. Combination, absolutely in stock, this luxurious outfit complete only costs £102/10; exchanges, easy terms.—Julian, Broad St., Reading 'Phone: 1024. [X1485]

A.J.S. 1913 6h.p. Coachbuilt Combination, speedometer, Lucas lamp set, rear lamp, Schebler carburettor, good tyres, new Kempshall non-skid back, special machine, very powerful, just re-namelled, plated—193, Broomwood Rd., Clapham, S.W. [8635]

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1910 3½ h.p. Tourist TRIUMPH	£22 10
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1913 6 h.p. 2-speed F.E. REX, chain drive, smart coach Sidecar	£43 10
1913 RUDGE Multi and Sidecar	£38 10
1913 7-h.p. QUADRANT and Sidecar	£49 10
ROVER, 3½ h.p., 3-speed Combination	£43 10
1912 3½ h.p. 2-speed PREMIER and Sidecar	£33 10
1911 3½ h.p. N.S.U., 2 speeds and Sidecar	£19 13
1910 3½ h.p. 2-speed REX and Sidecar	£24 10
6 h.p. 2-speed V.S. and Sidecar	£23 10

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New 8 h.p. W.-C. WILLIAMSON Cy-cl-ca.	£126 0
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WANTED.—Second-hand Douglas, for cash.

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## MOTOR CYCLES FOR SALE.

### A.J.S.

A.J.S., 6h.p., 3-speed countershaft, kick start, clutch, new Gloria sidecar, 2 head lamps, rear lamp, watch, mirror; bargain, £63.—Vickers, Newsagent, Brandon Colliery, Durham. [X887]

1914 6h.p. A.J.S. and Sidecar, C.A.V. electric head and tail lamps, with 6 volt accumulator sidecar fitted with hood and wind screen; any trial by appointment; £67.—86, High Rd., Lee. [866]

6 h.p. A.J.S., 1914, 3-speed countershaft gear, free engine, fitted with Gloria sidecar, fitted with Lucas lighting set, Lucas horn, rear light, tools, and spares; any severe trial given; mechanically sound; new; 70 gns.; rare opportunity.—Wauchope's, 9, Sh Lane, London. [X947]

6 h.p. 1916 Model A.J.S. Motor Cycle de Luxe, fitted superbly, having 3-speed gear and clutch drive only delivered by manufacturers recently to the ord of an officer on leave; having suddenly to return duty, he offers this machine, which cost £88, £77/10; used once only.—Officer, c/o Motor Supply Co., Chard. [88]

6 h.p. A.J.S., almost new, not done 500 miles, with Milford tandem sidecar, with special spring cushion, fitted with Watford speedometer, Lucas head lamp and tail lamp, Lucas horn, sidecar lamp, 2 spare tubes and tyre, plugs, about 2 gallon Petrol Motorcar, splendid condition; reason selling, ill-health cost about £110.—Apply, Batt, Chemist, York. [X93]

### Aldays.

ALLDAYS Allon, all models: immediate delivery easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [07]

ALLDAYS Matchless, 1915, 2½ h.p., 2-stroke, 3-speed clutch, P. and H. lamp, Dualop belt; £27.—Albert Rd., Abergavenny. [85]

NEW Allons, 2-speed models £42, single-speed models £34; delivery from stock; cash or extended payments.—Wauchope's, 9, Shoe Lane, London. [X94]

ALLDAYS Matchless, 1914½, 2½ h.p., 2-stroke, split did condition, new Stelastie tyres, £20; also 11 wicker sidecar, £2, or close offer.—11, Rockhall Rd., Cricklewood. [85]

ALLON, 2-stroke, or Allon 2-stroke. Nothing further to buy. Fully equipped, even to the petrol oil for your first journey; call and get particulars.—C more Depot, 261, Deansgate, Manchester. [85]

ALLDAYS Allon, bargain, new April, 1915, 1.5 miles only, 2-speed gear, speedometer, horn, mirror, P. and H. 610, head light, generator, connected, light, spares, tyre and tube, chain, piston rings, tools, used only summer months; owner bought Morgan £35; in perfect condition.—Archer, 112, High St. Strood, Kent. [85]

### Antoine.

5-h.p. Twin Antoine, Chater-Lea, and C.B. sidecar B. and B. mag., Whittle, watch, carrier; in away: good condition; £25.—73, Parish Lane, Pen [86]

### Ariel.

ARIEL, 3½ h.p., 1911-12, Bosch mag., new tyre £20.—A. Speechley, 45, Church Rd., Acton. [88]

ARIEL, 2½ h.p., h.b.c., mag. wants adjusting; £51.—Smith, 16, Queen's Av., Whetstone, London. [87]

ARIEL, 3½ h.p., 3-speed, sporting sidecar, all accessories; £30, or exchange for higher h.p., with adjustment.—Thain, 40, Bessford Rd., Waltham [X95]

## MOTOR CYCLES FOR SALE.

Douglas.

1914 2½ h.p. T.T. Douglas, 2 speeds, lamps, tools, all accessories, excellent condition, little used; £38.—436, Whitehorse Rd., Thornton Heath. [8799]

4 h.p. 3-speed 1915 Douglas, only run 1,500 miles, speedometer, lamp, horn, complete, guaranteed; £55.—Brook Motor Cycles, Burnham, Som. [8577]

DOUGLAS, 2½ h.p., 1915, Colonial model, 2 speeds, accessories, good order; bargain; owner at front; £42.—Barkston Garage, 244, Earl's Court Rd. [8561]

DOUGLAS, 1914, 2½ h.p., T.T., special, fast machine, 2 speeds, new tyres, long exhaust pipe; £36.—Percy and Co., 357, Euston Rd., London. [8713]

DOUGLAS War Office Model, 2-speed; £54/12; just arrived from works; immediate delivery.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [8604]

DOUGLAS, 2½ h.p., 1914, T.T., lamps, speedometer, horn, full tool kit, complete; £35.—K. C. Campbell, 2nd Lt., O.C., 11th Border Details, Coddford, Wilts. [8643]

DOUGLAS, October, 1914, 2-speed, T.T., Lucas head and tail lamps, Lucas, horn, fast, exceptional condition; £39.—Todd, 181, Plymouth Grove, Manchester. [X9438]

DOUGLAS, model U, 3-speed gear and free engine; £52/10, just arrived from works; immediate delivery.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [8603]

1914 2½ h.p. Douglas, 2-speed, perfect condition, complete with lamp, horn, tools, and speedometer; owner joined army; £35.—Apply, A. Edwards, Shirkburn, Watlington, Oxon. [8634]

DOUGLAS, Douglas, Douglas.—Write us your requirements. We can supply all latest models to be had.—Alexander's, Scottish wholesale and retail agents, 115, Lothian Rd., Edinburgh. [8254]

LATE 1913 Douglas, 2½ h.p., 2-speed, accessories, new tyres, remarkable condition for 1913 machine; only wants seeing; £35, or offers.—Alexander, 25, Parsons Green, Fulham. [8809]

DOUGLAS, Immediate delivery models U, V, W. Book your orders now from the sole agent for Anglesey and Carmarvonshire. Tel.: No. 5.—Jones, Anglesey Motor Mart, Llanfairpwll. [X9486]

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DOUGLAS, 1915, 4 h.p., 3 speeds, kick starter, clutch, speedometer, Anticlope and rear lamps, Low generator, horn, mileage 1,500, unscratched, equal new; 50 gns.—Moody, 122, Bromyard Rd., Worcester. [X9283]

DOUGLAS, 1914½ model W, 2½ h.p., perfect condition, as new, Lucas horn, lamps, Amac carburettor, Cowey speedometer, every accessory and spares; £45; seen by appointment.—M.B., Derwent, Clarence Rd., Clapham Park. [8704]

DOUGLAS Mode U, £50/8; Douglas Model V, £50/8; War Office Model, £54/12; Douglas Model W, £56/14; Douglas Model X, £56/14.—Above models actually in stock at Sole Wholesale and Retail Midland Distributing Agents, Colmore Depot, 31, Colmore Row, Birmingham. [X2344]

1910 Douglas, 2-speed gear, thoroughly overhauled, in perfect running order. We are offering this machine at the ridiculously low price of 17 gns. to clear. It is without doubt the cheapest Douglas in England to-day.—Julian, Broad St., Reading. Biggest motor cycle and light car dealer in the South. 45 years' reputation. [X9628]

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DRENG Lightweight Motor Cycles, 27 gns.; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8589]

Eagle.

COVENTRY Eagle, 1915, 2-stroke Villiers engine, large Lucas lamps, horn, Dunlops, slightly soiled; £28.—Marston, 26 and 31, Bridge St., Chester. [X9505]

Enfield.

1913 Enfield 6 h.p. Combination, good order; £43.—May, Plumber, Leyburn, Yorks. [X9406]

ROYAL Enfields, 1915, second-hand 6 h.p. combinations, from £70; trial run.—Below.

ROYAL Enfields, new 1916 combinations; £89/5, in stock; exchanges; beginners taught free.—Below.

ROYAL Enfields.—For Woolwich, Plumstead, Greenwich, Blackheath, Charlton, North Woolwich, and Silvertown, sole district agent, W. Hill, 20, High St., Woolwich. [X9387]

ENFIELD 1910 2½ h.p. Twin, good condition; £13.—Rand, 23, Cornwall Rd., St. Albans. [8691]

ENFIELD Combination, late 1913, spares, perfect condition; £44.—Whitehorn, Coachbuilder, Tredgar. [8632]

ENFIELD Lightweight, 2½ h.p. twin, mag., Binks 3-jet carburettor; £15/10.—F.F., Hollym, Withernsea. [X9391]

ENFIELD 2-stroke, August, 1915, done 300, unscratched; 32 gns.—Heathurst, The Vale, Hampstead. [8813]

ROYAL Enfield, 2-stroke, 2 speeds, late 1915, only ridden few miles; £30.—76, Snammerley St., Earlsfield, S.W. [8765]

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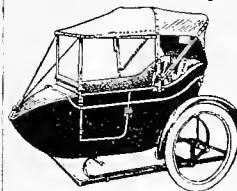
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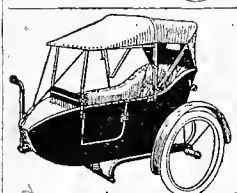


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1915 IXION, 2-stroke, nearly new ..... £26 0  
1914 IXION, 2-stroke ..... £22 0  
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1911 T.T. TRIUMPH, just renovated ..... £25 0  
1910 F.E. TRIUMPH ..... £25 0  
1913 TRIUMPH, 3-sp., and coach-built Sidecar ..... £48 0  
1915 3-sp. 2½ h.p. DOUGLAS, like new, lamp and horn ..... £46 0  
1913 6 h.p. REX, F.E., fine order ..... £25 0  
1911 2½ h.p. ROYAL ENFIELD, twin, magneto, etc., splendid order ..... £13 0  
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## MOTOR CYCLES FOR SALE.

## Enfield.

ENFIELD, 1916 models, combinations, 3b.p. twins, and 2-strokes in stock.—Butcher and Co., Clarence St., Kingston. [X8979a]

ENFIELD, 1916, 5h.p., just arrived from works; #52/10.—Wilkins, Simpson, and Co., 11, Hammer-smith Rd., London. [8610]

ENFIELD Combination, 6h.p., 1915, B400, horn, speedometer, splendid condition; #65.—Carrow, 4, Carlyle Sq., Chelsea. [X9404]

ENFIELD 6h.p. 1916 Combinations, delivery from 1 stock; price #89/5, or deferred payments.—Layton's Garage, Bicester, Oxon. [X9549]

1914 6h.p. Royal Enfield Sidecar Combination, complete with accessories; #59; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X9480]

1915 Enfield, 5h.p., 2-speed, model 140, new, but slightly shop-soiled; list price #52/10, going at #45.—Alexander's, 115, Lothian Rd., Edinburgh. [8255]

1912 6h.p. Enfield, special wide coachbuilt sidecar to seat 2, accessories, etc.; #245, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0722]

1913 Enfield, coach body, new chassis, screen, tyres good, new Palmer cord back, accessories; seen any time; #49.—Lewis, 20, Normandy St., Alton, Hants. [8791]

6h.p. Enfield Combination, new June, 1914, in perfect condition; price #50 to ride away.—Box 312, c/o Marber and Crowther, Ltd., 10-13, New Bridge St., E.C. [8632]

ENFIELD 6h.p. 1916 Combination, just arrived from works; immediate delivery; #89/5; make sure of this now.—Wilkins, Simpson, and Co., 11, Hammer-smith Rd., London. [8605]

2h.p. Enfield, 1912, countershaft, chain drive, new 4 chains and spares; #27 just sent overhauling, perfect condition; trial; #22/10.—Wilson, Bramston Rd., Burton-on-Trent. [8646]

ENFIELD Combination, 6h.p., Nov., 1914, in splendid condition, complete with all accessories and spares, new tyres; any examination; #65, lowest.—Channer, 3, Week St., Maidstone. [8619]

1914 2h.p. Enfield, 2-speed and free, scarcely used since war, condition as new, accessories, etc., P. and H. lamp, rear light, new Kempshall back; #27.—Edmonds, 5, Grosvenor Place, Bath. [X9516]

ROYAL Enfield, 1913 combination, 6h.p., coachbuilt sidecar, perfect working order, just had #8 overhauling by Enfield Cycle Co.; accept nearest offer #50.—Goyder Smith, Gernode, Berkhamsted. [8666]

ENFIELD Lightweight, 2h.p., in perfect order, complete with 2 lamps, horn, pump, tools; bargain; #18; also Premier lightweight, nearly new, offers.—Blake, 9, St. Michael's Rd., Aldershot. [X9606]

ROYAL Enfield, 3h.p., 1915, not ridden 250 miles, complete with all accessories, scarcely discernible from new, Palmers both wheels; price #42/10/6, good bargain.—Wauchope's, 9, Shoe Lane, London. [X9466]

ENFIELDS, 1916 models in stock; 2-strokes, 3h.p. twins, and 6h.p. combinations, also De Luxe combination, with Lucas lighting set, etc.; prices from 40 gns.—P. J. Evans, John Bright St., Birmingham. [8785]

ROYAL Enfield, 1916 models in stock; 2-strokes, 3h.p. twin, and 6h.p. combinations, also De Luxe combination, with Lucas lighting set, etc.; prices from 40 gns.—P. J. Evans, John Bright St., Birmingham. [8786]

LATE 1914 Enfield Combination, complete with Lucas head and rear lamps and horn, in perfect running order, just had Palmer heavy cord tyre fitted to back wheel; #65.—Evans, Swiss Villa, Clay Cross, Chesterfield. [X9395]

1915-1916 6h.p. Enfield Combination, lamp, generator, and horn, only used 3 times, bought in November, costing #92, would pass for new; owner enlisted; #74.—Alexander and Co., 115, Lothian Rd., Edinburgh. [8253]

ENFIELD, 1916, latest model, 2-stroke, 2h.p., 2-speed, and free engine, chain drive, just arrived from works; immediate delivery; #42; make sure of this now.—Wilkins, Simpson, and Co., 11, Hammer-smith Rd., London. [8608]

ENFIELD 1916 6h.p. Combination just in, with hood and screen. #94/5; also 1914, with screen, apron, speedometer, all accessories, 65 gns.; liberal deferred payments, generous exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [8660]

ROYAL Enfield New Combinations, 6h.p., chain-driven machines, fitted with handsome coachbuilt sidecar, countershaft gear and free engine, up-to-date turnout, complete with storm apron; 85 gns.; tuition free, and free delivery to any address within 50 miles of London; best terms for cash, exchange, or extended payments.—Wauchope's, 9, Shoe Lane, London. [X9469]

## Excelsior.

EXCELSIOR, 7-9h.p., electrically equipped; only one, #70 for cash; shop-soiled only.—Colmore Depot, 261, Deansgate, Manchester. [8582]

1916 Excelsior (British), 8h.p. J.A.P., Jardine 3-speed gear, Mills-Pulford Express sidecar, Lucas dynamo lighting set; #112, complete.—Below.

1915 Excelsior (British), 2-stroke; #20/16.—W. Brandish, the Triumph Garage, Foleshill Rd., Coventry. [X8949]

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## MOTOR CYCLES FOR SALE.

## Excelsior.

EXCELSIOR (American), 7-9h.p., 3-speed model, quite new; usual price #75, accept #58, or deferred payments.—Layton's Garage, Bicester, Oxon. [X9550]

7-9h.p. Excelsior (American), late 1915, Bosch, Lucas lamp, Mills-Pulford 12 gn. sidecar, outfit as new, used 500 miles; #65.—10, Norwood Crescent, Southport. [X9514]

AMERICAN Excelsior, 1914-15, very fine coachbuilt combination, 7-9h.p. twin, mag., 2 speeds, countershaft, lamp, speedometer; sacrifice 49 gns. worth #65; exchange 3h.p.—1, Ebner St., Wandsworth. [X9619]

EXCELSIOR (American), late 1914, 7-9h.p., coachbuilt sidecar, screen, 2-speed, chain drive, countershaft gear, lamp, horn, accessories, condition as new; #58, no offers.—Poole, 2a, Beaufoy Rd., Battersea. [8639]

AMERICAN Excelsior, 1916 models, #75, De Luxe #85; immediate delivery. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Gange, Charing Cross, London. [8597]

SLIGHTLY USED 7-9h.p. Electrically Equipped Excelsior Combination, fitted with Model de Luxe Empire sidecar; the present list price of combination #115, quick sale will accept #80; not done 50 miles.—Colmore Depot, 31, Colmore Rd., Birmingham. [X9303]

## F.N.

F.N., 2h.p., 2 speeds, and clutch, overhauled; #14.—Earl, 5, Heath St., Hampstead. [X9610]

F.N., 1913, 4-cyl., 2 speeds, and clutch, all accessories; #28.—Earl, 5, Heath St., Hampstead. [X9611]

F.N., 2h.p., 2-speed, clutch, new condition throughout; #16, or offer.—Marston, 26 and 31, Bridge St., Chester. [X9507]

1913 F.N., 2h.p., 2-speed, recently renovated throughout; bargain, #20.—Box 9,927, c/o The Motor Cycle. [X9436]

## Gamage.

1915 Gamage, 3h.p., clutch, heavy tyres; #24; approval, deposit system.—17, Gardner St., Brighton. [8748]

## Grandex.

GRANDEX, 2h.p., Precision engine, in perfect running order, all accessories; #18.—H. A. Evans, 59, Beckenham Rd., Penge, S.E. [8631]

GRANDEX-PRECISION, 3h.p., T.T. model, late 1915, only done 200 miles, very fast; cost #42, an utter snip at #27.—Below.

GRANDEX-PRECISION, 6b.p., sidecar machine, 3-speed gear, handle starter, all the latest, for #32, a fine bargain.

GRANDEX-PRECISION, 4-stroke, 2-speed Pup model; #15, perfect.—Grandex, 86, Gray's Inn Rd., W.C. [X9560]

## Harley-Davidson.

HARLEY-DAVIDSONS in Stock.—Premier Motor Co., Birmingham.

MODEL 11J, with dynamo electric lighting; #76/13, duty free.—Premier Motor Co., Birmingham. [8684]

1915 Harley-Davidson, 3 speeds, with dynamo lighting; cost #86; done 900 miles; price #65.—Below. (D)

1915 Harley-Davidson, 4h.p., single-cyl., 2-speed, and clutch, kick start, ordered by officer who has left for Front, never been used; present price #68, first cheque #50 secures, carriage paid.—Exchange Garage, Athenaeum Place, Plymouth. (L) [X9535]

HARLEY-DAVIDSON Models in stock, complete with Gloria sidecar.—Turpins, 22 and 29, Preston Rd., Brighton. [0713]

HARLEY-DAVIDSON, model 11J, 7-9h.p., complete electrical outfit, shop-soiled; #65/19/6.—J. Grose, Ltd., 8, New Bridge St., E.C. [8628]

HARLEY-DAVIDSON, 1915, 3 speeds, 7-9h.p., coachbuilt combination, 3 weeks old; cost #96, best offer over #65.—White, 121, Adelaide Rd., Chalk Farm. [X9577]

FOR Sale, 11F model Harley-Davidson, 3-speed gear, with Milliford sidecar, excellent condition; owner going abroad; what offers?—Box L469, c/o The Motor Cycle. [8573]

HARLEY-DAVIDSON, 11J, with Milliford Express special sidecar, turnout as new, tyres unpunctured, mileage does not exceed 500; #78.—Colmore Depot, 31, Colmore Row, Birmingham. [X9504]

HARLEY-DAVIDSON, not done 300 miles, Northern 14 gn. sidecar, streamline body, front and rear lamps, horn, etc., as new; #70.—W. Brandish, the Triumph Garage, Foleshill Rd., Coventry. [X8950]

HARLEY-DAVIDSON, 1915, 7h.p., 3-speed, perfect condition, not done 3,000 miles solo, Miller head and rear lamps, Lucas horn, full set of spares and tools; owner at Front; #58, no offers.—See address below.

HARLEY-DAVIDSON, 1915, 7h.p., 3-speed, perfect condition, not done 4,000 miles, together with 16 gn. Montgomery sidecar, H.D. grey, 2 Lucas head lamps, and 1 rear lamp, 1 Lucas horn, and hand Klaxon, 2 new spare heavy Hutchinson covers, and 1 tube, 2 others partly worn, 1 new Dunlop sidecar tyre, large set of tools and spares, security bolts fitted to rims, large mud screens fitted to down tube; #80.—2nd Lieut. Horne, Motor Cyclists' Coy., Dunstable Signal Depot, Dunstable, Beds. [8620]

## MOTOR CYCLES FOR SALE.

## New Hudson.

6 h.p. 1915 Twin-cyl. 3-speed and Free Engine New Hudson and coachbuilt sidecar, very silent running machine, carries our guarantee of fitness; any severe trial given, complete with all accessories; £60.—Wauchope's, 9, Shoe Lane, London. [X9471]

NEW Hudson, 3½ h.p., 1913½, 3-speed, clutch model, pedal starter, just been re-plated and enamelled, new tyres, horn, pump, tools, also Canoelet sidecar to match; bargain, £40: will sell separate, or exchange for higher power.—Water Works, Whitby, Cheshire. [8648]

NEW Hudson, 1915, 2½ h.p., 2-stroke, with heavy Dunlop back tyre, in magnificent condition, and splendid running order; 22 gns.; cheapest New Hudson in England to-day.—Julian, Broad St., Reading. Biggest motor cycle and light car dealer in the South. Phone: 1024. [X9629]

## New Imperial.

NEW Imperial-Jap, 1916 models, in stock, from £36/15.—Crow Bros., 190, High St., Guildford. [8413]

NEW Imperial, light tourist, immediate delivery; cash, or easy terms.—Referee Cycle Co., 332, High Holborn. [0765]

1915 (June) New Imperial, 2 speeds, perfect, do 40 m.p.h.; 26 gns.—Heathurst, The Vale, Hampstead. [8815]

NEW Imperial, 2½ h.p., 2-speed, £27; also 1912 3½ h.p. Rudge, single, £24.—Cross, 9, Dukes Av., Chiswick. [8665]

NEW Imperial-Jap, 1915, 2½ h.p., 2-speed, shop soiled; 30 gns.—Julian, Broad St., Reading. Phone: 1024. [X6408]

NEW Imperials, delivery 1916 models from stock; prices from 35 gns.—P. J. Evans, John Bright St., Birmingham. [8781]

1915 New Imperial-Jap, single speed, perfect condition, all accessories, recently overhauled; £20.—Advertiser, 21, Mount Av., Ealing. [8740]

NEW Imperial, delivery from stock of the 2½ h.p. J.A.P.-engine 2-speed model; £36/15, or deferred payments.—Layton's Garage, Bicester, Oxon. [X9554]

NEW Imperials, 1916 models, in stock; sole London agents; trade supplied; few 1915 shop-soiled at reduced prices.—A. P. Rey, 173, Gt. Portland St., London, W. [7832]

IMPERIAL J.A.P. Light Tourist, 2½ h.p., Dunlops 2-speed, latest model; £36/15; just arrived; immediate delivery.—Wilkins, Simpson, and Co., 11, Hanmer Smith Rd., London. [8607]

2½ h.p. New Imperial-Japs, latest models, just delivered, 2-speed and free engine, an ideal lightweight; £36/15; cash, extended payments, or exchange.—Wauchope's, 9, Shoe Lane, London. [X9472]

3½ h.p. New Imperial-Jap, 1915, 3-speed countershaft, kick start, practically as new, complete with lamps, mechanical horn, speedometer, mileage 1,900; £48; exchanges, easy terms.—Ideal Cycle Co., Thundersley, Essex. [8841]

NEW Imperial, the aristocrat, quite a favourite with Naval and Military officers, £38, 2-speed model, or £9/10 deposit and 12 monthly payments of £2/12/3; immediate delivery.—Colmore Depot, 261, Deansgate Manchester. [8580]

## New Ryder.

1915 New Ryder, 2-stroke, and accessories; £22/10.—Colmore Depot, 31, Colmore Row, Birmingham [X9308]

## Norton.

1916 Nortons, T.T. and Big Four combinations, actually in stock.—G. W. Wilkin and Co., Hunter's Bar, Sheffield. [8549]

1916 3½ h.p. 3-speed Countershaft Norton, 62 gns.; also several 1914 Nortons in stock, £45.—Parker and Son, St. Ives, Hunts. [8803]

NORTONS, 1916 models in stock; Brooklands road special, T.T. model, sporting countershaft, and De Luxe combinations.—P. J. Evans, John Bright St., Birmingham. [8782]

## N.S.U.

N.S.U., 1914 C.B. combination, 4 h.p., 2-speed, new condition, hood, lamps, accessories; £35; seen London.—Goodfellow, St. Valery, The Leas, Westcliff-on-Sea. [X9608]

## N.U.T.

3½ h.p. N.U.T., twin-cyl., 3-speed and free engine 2 model, fitted with a smart coachbuilt sidecar; £45; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X9481]

N.U.T.'S.—All models from £53/11 to £78/15; carried on deliveries. All motor cycles brought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8592]

## O.K.

O.K. 2½ h.p., 2-speed, 1915 model, nearly new; £25, complete.—Marston, 26 and 31, Bridge St., Chester. [X9497]

1915 O.K., 3-speed, Sturmer-Archer gear, pedal start, splendid condition throughout; £26.—Colmore Depot, 31, Colmore Row, Birmingham. [X9311]

O.K. Junior, 1915, countershaft speed gear, complete set lamps, splendid tyres, in excellent order £23, bargain.—Willie Kelleff, Plasnewydd, Ruthin. [X9393]

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(1) A.J.S., 2½ h.p., 3-speed gear	£58 0
(2) Mod. C NEW HUDSON 2-strokes, ea.	£38 0
(2) Mod. D NEW HUDSON 2-strokes, ea.	£42 0
(1) NEW HUDSON, Model 6A, 3½ h.p., 3-speed countershaft	£65 0
(1) A.J.S. Combination, 6 h.p., with A.J.S. Sidecar with hood & screen	£100 17
(1) DOUGLAS, Model U, 3-speed gear	£52 10
(1) DOUGLAS, Model V, 2½ h.p., 3-speed gear	£52 10

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(1) HUMBER, 3½ h.p., 3-speed gear ... £53 0

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NEW HUDSON 3½-4 h.p. Combination, complete with all lamps, horn, and accessories, in perfect order, 1915	£50 0
DOUGLAS, 1913, 2½ h.p., 2-speed gear, in excellent order	£32 0
BAT, 3½ h.p., J.A.P. engine, single-speed, in good order	£18 0
MATCHLESS, 1912, 8 h.p., J.A.P. engine, 2-speed gear, in good condition	£38 0
ZENITH-GRADUA, twin, 3½ h.p., J.A.P. engine, countershaft model, 1915	£40 0
B.S.A., 1913, 3½ h.p., 2-speed gear, side- car mount	£29 0
TRIUMPH, 1908, with Brampton vari- able gear, in good order	£17 10
KERRY-ABINGDON, 1912, 3½ h.p., 2-sp. gear, recently overhauled, new tyres	£28 0

Any make of Motor Cycle or Light Car supplied.  
Second-hand Bargains always in stock.

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## MOTOR CYCLES FOR SALE.

## O.K.

O.K. Junior, 1915, 2½ h.p., 2-speed countershaft,  
excellent tyres, plate, enamel first-class, engine  
overhauled, guaranteed; £25.—Robinson's Garage,  
Green St., Cambridge. [0612]

## Omega.

OMEGA, 1915½, 3 h.p., countershaft 2-speed, only  
done 40 miles, absolutely unscratched and per-  
fect; £35.—Webb, Belmont, Surrey. [8694]

## P. and M.

P. and M., 1911, 2-speed, good condition, lamp, horn,  
new tyres; £24, or nearest.—Mabane, Park Ter-  
race, South Shields. [X8982]

P. and M. Type Motor Cycle, 3½ h.p., clutch, chain  
drive, without ignition; £8.—T. H. Glencross, 136,  
Allerott Rd., Kentish Town. [X9394]

## Premier.

3½ h.p. Twin Premier, 1912, 2-speed, condition good;  
£23.—Gladden, Caterham Valley. [8816]

NEARLY New C.S. 2-speed Premier, Lucas lamp and  
horn; £42.—A. J. Young, Newark. [8325]

1914 Premier Combination, 3 speeds, clutch, as new;  
39 gns.—Heathurst, The Vale, Hampstead. [8814]

PREMIER 1912 2 h.p. Lightweight, in good condi-  
tion; £10/10 cash.—Box 9,928, c/o The Motor  
Cycle. [X9437]

PREMIER, 1913, 3 speeds, Canoelet de Luxe sidecar;  
any trial, seen any time; £38.—Phillips, 8, Grand  
Parade, Harrogate. [8766]

PREMIER, 1914, 3½ h.p. T.T. model, lamps, speed-  
ometer; £27/10.—Hilton, Sharp, and Co., Ltd.,  
Foxhall Sq., Blackpool. [X9428]

PREMIER, 1914, 2½ h.p., 3-speed model, a little  
gem, nearly new; accept £30, or deferred pay-  
ments.—Layton's Garage, Bicester, Oxon. [X9555]

PREMIER, 1913, 3½ h.p., free engine clutch, 2 speeds,  
countershaft, chain-cum-belt, lamp, horn, Watford  
speedometer, footboards, all-black finish, only done  
5,400, spare valve, tube, and tools, new back tyre re-  
cently, machine in perfect condition; cost over £60,  
bargain, £36.—Mulligan, Holywood, Dowa. [X9421]

## Quadrant.

QUADRANTS from stock, all-chain drive and chain-  
cum-belt models.—Wauchope's, 9, Shoe Lane,  
London. [X9478]

3½ h.p. Quadrant, fitted with variable gear, sound  
2nd condition; £20; guaranteed.—Wauchope's, 9,  
Shoe Lane, London. [X9473]

QUADRANT, 1916, B.S.A. countershaft gear, belt-  
cum-chain; £72/10; actually in stock; generous  
deferred payments, liberal exchanges.—Lamb's, 151,  
High St., Walthamstow, and 50, High Rd., Wood Green.  
[8659]

QUADRANT, nearly new, 4 h.p., coach sidecar, 2  
speeds, free engine, B.B. carburettor, Simms mag.,  
tools, lamps, etc., reliable; £28; will take modern lathe  
in part payment; no rubbish offered or wanted.—Rhodes,  
3, Brookroyd Lane, Batley. [X9285]

## Radco.

RADCO Motor Cycle, with accessories; sacrifice £20.  
—Davis, 23, Neville Rd., Ealing. [8629]

## Rex.

REX Cycle, low, 5-6 h.p. twin, Druif forks, B.B. car-  
burettor; accept £6/15.—E., 208, Camberwell Rd.,  
S.E. [8774]

REX, 1914, 6 h.p., 3-speed countershaft combination,  
speedometer; £55.—Box 1472, c/o The Motor  
Cycle. [8587]

REX 3½ h.p. T.T., 1911-12, Bosch watertight, fine  
machine; £15/10.—Speechley, 45, Church Rd.,  
Acton. [8861]

REX 1911 Coachbuilt Combination, 5-6 h.p. twin,  
mag., 2 speeds; any trial; £26/10.—1, Ebner St.,  
Wandsworth. [X9621]

3½ h.p. 1910 Rex, N.S.U. gear, lamps, horn, tools, ex-  
cellent condition; £20, or offer; photo.—C. F.  
Lumbard, Ashbourne. [8708]

REX, 6 h.p., 2-speed, free engine, handle starting,  
Bosch mag., drip feed, and smart cane sidecar, side  
entrance; £20, bargain.—29, St. Leonard's St., Bow, E.  
[8689]

REX, 3½ h.p., free engine, mag., accessories, 2 lamp,  
splendid condition, detachable sidecar; accept £26,  
bargain.—Freeman, 10, Downs Rd., Clapton, London.  
N.E. [X9521]

6 h.p. Twin Rex Combination, motor cycle and sidecar,  
done about 5,000 miles, in perfect condition  
throughout, all accessories, 2-speed, with clutch, tyres  
all in good condition; £50, or near offer. Oakley, Ltd.,  
85, Regency St., London, S.W. [0755]

## Rex-Jap.

REX-J.A.P. 6 h.p., 2-speed, free engine, handle start-  
ing, coachbuilt sidecar; £35.—Colmore Depot, 31,  
Colmore Row, Birmingham. [X9301]

REX-J.A.P., 1914, 6 h.p., countershaft 3-speed, chain  
drive, kick starter, coachbuilt combination, lug-  
sage and petrol can carriers, F.R.S. lamp, horn, Cowi  
speedometer, perfect condition, recently overhauled;  
£80.—W., c/o The Pharmacy, Llandrindod Wells. [8624]



## MOTOR CYCLES FOR SALE.

## Rover.

ROVER, late 1913, 3½ h.p., 3-speed, basket sidecar; nearest offer to £40.—Lollard, Ayuhio, Banbury. [X9351]

32 h.p. Countershaft 3-speed Rover, 1915, as new; £50.—Haynes Bros., Ltd., Gabriel's Hill, Midstone. [X9349]

1916 3½ h.p. Rover Combination; £84/7; first cheque secured.—G. W. Wilkin and Co., Hunter's Bar, Sheffield. [X8548]

ROVER 1914½ Combination, splendid condition, used week-ends only; £55, or near offer.—R.B.B., 8, Albert St., S.W. [X8617]

ROVER, 1916 models in stock; immediate delivery T.T. models, with or without Philipson.—P. J. Evans, John Bright St., Birmingham. [X8783]

ROVER, late 1913, 3½ h.p., 3-speed, clutch, coachbuilt combination, accessories, perfect condition; £40.—Priest, Connaught Ave., Frinton-on-Sea. [X8672]

ROVER, 1913-14, 3½ h.p., 3-speed (Sturmer-Archer), and sidecar, 3 lamps, wind screen, splendid condition; £40, or nearest offer.—13, Lincoln St., Coventry. [X9524]

ROVER Combination, and Sturmer 3-speed, new 1915, cost £80 complete; best offer over £52; 2-stroke taken part exchange.—Westley, Outfitter, Hales St., Coventry. [X9625]

1915 3½ h.p. Rover Combination, with lamps and horn; owner buying car; only run 700 miles, a beauty; price £70.—J. Parry, Butcher, Chapter St., Llandudno. [X8640]

ROVER, 1913, free engine, 3½ h.p., and coachbuilt sidecar, £26; also a 1914 3-speed model and coachbuilt sidecar, £38.—Percy and Co., 337, Euston Rd., London. [X8715]

ROVER 3-speed Demonstration Machine, countershaft gears, Lucas lamps and Cowey speedometer included; £55, guaranteed as new.—Colmore Depot, 31, Colmore Row, Birmingham. [X9312]

1914 3½ h.p. Rover and Sidecar, 3-speed, clutch, Bosch, E. and B. carburetter, Dunlops, 2 P. and H. lamps, Jones speedometer, beautiful condition; biggest bargain ever offered; £32.—Box L482, c/o The Motor Cycle. [X8856]

1914 Rover, 3½ h.p., 3-speed, Dunlop tyres and belt, Brooks 170 saddle, footboards, with Mills-Fulford coach sidecar, ridden under 1,000 miles, as new, engine guaranteed; £47/10.—Robinson's Garage, Green St., Cambridge. [X613]

## Royal Ruby.

ROYAL Ruby, 3½ h.p., 1912½, fitted with Gradua puller gear, large P. and H. lamp, generator, Cowey speedometer, horn, handle-bar mirror, good belt, new banjo heavy cover on front, Clincher Dreadnought on back; bargain, £21.—King, 20, Bridge St., Cambridge. [X9617]

## Rudge

RUDGE Multi 1916 T.T. Models in stock; £58/15.—Marston, 26 and 31, Bridge St., Chester. [X9501]

1913 Rudge Multi, just been overhauled by us; £28.—Colmore Depot, 31, Colmore Row, Birmingham. [X9305]

RUDGE Multi, 1913, 5-6 h.p., lamps, horn, tools, etc., in excellent condition; £36.—Longman, 1, King St., Acton. [X8721]

RUDGE Multi, 1915, 3½ h.p., and coachbuilt sidecar, new condition; sacrifice £50.—Longman, 1, King St., Acton. [X8720]

32 h.p. Rudge Multi, 1914 model, free engine, complete with all accessories; £35.—Wanchop's, 9, Shoe Lane, London. [X9483]

SEVERAL Ridges for sale, including two 1915 5-6 h.p. Multis; cheap.—Morgan and Maxwell, 80, High Rd., Streatham. [X0766]

1915 I.O.M. T.T. 3½ h.p. Rudge Multi, horn, lamps, speedometer, spares, and Millford sidecar; £52.—5, High Bank, Denton, Manchester. [X8983]

1914 Rudge Multi, 5-6 h.p. coachbuilt sidecar, Millers lamp, tyres new, John Bull belt; £38/10.—P. S. Wells, London Rd., Knockholt, Kent. [X9402]

RUDGE Multi, 3½ h.p., October, 1912, thoroughly renovated and re-bushed, splendid condition; £27.—G., 21, Bedford Rd., East Finchley, N. [X8709]

RUDGE 1913 Combination, free engine, tyres good condition; £27; owner going to the Front.—Cochrane, 103, Swinley Rd., Alfreton, Wembley. [X8626]

RUDGE Multi, 5-6 h.p., coachbuilt combination, all accessories, excellent condition, fast and powerful; sacrifice £39/10.—Ainman, 15, Woodstock Ave., Golders Green, N.W. [X8853]

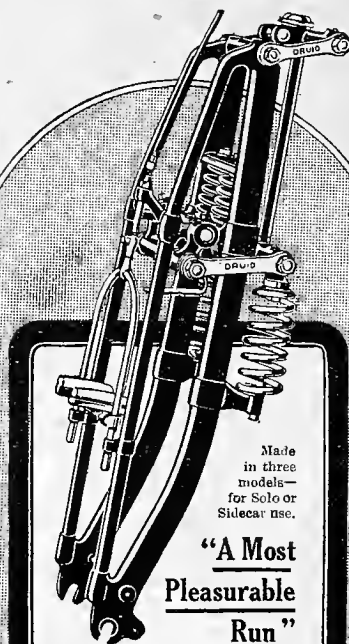
1914 3½ h.p. Rudge Multi and 12 in. under-lug coachbuilt Phoenix sidecar, 650×65 tyres all brand, and accessories; £45.—Hitchins, 53, East Terry Rd., Cubitt Town, Poplar, E. [X8611]

## Scott.

SCOTT 1916 Model in stock.—Marston, 26 and 31, Bridge St., Chester. [X9502]

SCOTT, 2-speed, kick start, lamp, horn, speedometer, Mills and Fulford sidecar, thoroughly overhauled; bargain, £36/10.—Leae Richards, Rho-y-medre, Rnabon. [X8664]

1912 Scott and Phoenix sidecar, hood, wind screen, 2-speed, kick starter, Binks 3-jet, sight feed lubrication; £35.—M. Sheldon, Church Rd., Wheatley, Oxon. [X9515]



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Leopold Street,  
BIRMINGHAM.

## MOTOR CYCLES FOR SALE.

## Scott.

1913½ Scott and wicker sidecar, has not done 7,000 miles, perfect in every detail, spare tubes, chains, tools; approval, deposit, £35, or near offer; owner enlisted.—Robertson, 172, High St., Ayr. [X9632]

SCOTTS.—1916 models £71/10; prompt delivery. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [X8599]

## Sheffield Minor.

SHEFFIELD Minors.—Immediate delivery of this exceptionally fine 2½ h.p. 2-stroke single-speed, 28 gns.; 2-speed, 33 gns., including 1916 improvements.—Colmore Depot, 31, Colmore Row, Birmingham. [X2340]

## Singer.

SINGER, 1913, 3½ h.p., free engine, and coachbuilt sidecar, in perfect order; £24.—Percy and Co., 337, Euston Rd., London. [X8714]

SINGER, 1913, Oct., 3½ h.p., 3-speed, free engine, original tyres good as new, all accessories; £38, or nearest offer.—Steele, Harpley. [X9382]

## Sparkbrook.

SPARKBROOK, 1915, 2-stroke, 2-speed, Lucas lamp and horn, nearly new; £30.—Marston, 26 and 31, Bridge St., Chester. [X9506]

## Sun.

SUN-VILLIERS, 3½ h.p., very good order; £18, complete.—Marston's, 26 and 31, Bridge St., Chester. [X9498]

SUN 2-stroke.—All models from £20/10 to £37; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [X8594]

## Sunbeam.

SUNBEAM, 1916.—New 3½ h.p. combination and T.T. models in stock.—Moss, Wem. [X9532]

SUNBEAM, the best all-weather mount; may cost you £70/10, but it's worth it; prompt deliveries.—Bunting, Harrow. [X8877]

1916 Latest Models 8 h.p. and 3½ h.p. Sunbeams actually in stock; also Sunbeam cycles.—A. J. Young and Co., Ltd., Newmarket. [X8329]

SUNBEAM, 2½ h.p. (March, 1915), 2-speed, h.b.c. clutch, unscratched, horn, electric rear lamp; £50, lowest.—Bailey, Old Court House, Hampstead Heath. [X8719]

SUNBEAM Combination, late 1915, 3-speed, Lucas lamps, Stewart speedometer, and horn; magnificent condition, with spares; £75.—Marston, 26 and 31, Bridge St., Chester. [X9504]

SUNBEAM, 1915, 2½ h.p., speedometer, lamps, 2 speeds, clutch, and kick starter, in perfect running order; £45, or near offer.—Green, Penn Cottage, Farborough, Kent. [X8647]

SUNBEAM, 6 h.p., Jenbro sidecar, screen, hood, side curtains, tyres practically new, lamps, lot spares, just fully overhauled by makers, all A1; £84.—Annan, Princess St., Wolverhampton. [X9452]

1915 3-speed Countershaft Sunbeam, P. and H. lamp and generator, speedometer, in perfect condition; property of an officer leaving for the Front; £57/10, a real bargain.—Lieut. H., c/o Moore, Motors, Andover. [X8743]

8 h.p. Sunbeam, 1916, twin, detachable wheels, latest engine, in stock, immediate delivery; also 3½ h.p. Sunbeam; at rock-bottom nett cash prices. Tel.: 388. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [X8667]

1915 3½ h.p. Sunbeam, 3-speed, Bates 2½ tyres, Brooks 170 saddle, lamp, horn, with 1915 £17/17 Sunbeam coachbuilt sidecar, with screen, apron, and luggage grid, general condition as new, guaranteed, under 2,000 miles, complete; £68.—Robinson's Garage, Green St., Cambridge. [X0650]

## Swift.

32 h.p. Swift, good, sound machine, running splendid; £20; guaranteed.—Wanchop's, 9, Shoe Lane, London. [X9474]

## T.D.C.

T.D.C., 2-stroke, 1915, electrical equipment; £16.—Shand, 14, Brandram Rd., Lee, S.E. [X8622]

DE LUXE T.D.C. in stock, immediate delivery; £22.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [X8682]

## Torpedo.

TORPEDO, 2½ h.p. Precision, 2-speed; £17.—248, Bishopsgate, London. [X8870]

TORPEDO, 3½ h.p., multi gear, too powerful; exchange for lightweight, or sell cheap; offers.—101, Clonmell Rd., Tottenham. [X8662]

## Triumph.

TRIUMPH, 1911, free engine, Bradbury 2-speed; £15.—248, Bishopsgate, London. [X8665]

TRIUMPH, with variable gear, owner enlisted; in good order; £25.—Bunting, Harrow. [X8875]

1912 Triumph, N.S.U. gear, F.R.S. lamp; £25.—Horton, 113 Wellington Rd., Leeds. [X9519]

1916 Junior Triumph, just delivered; £44/5.—Parker and Son, St. Ives, Hunts. [X8804]

R. H. S.

**MOTOR CYCLES FOR SALE.**

**Triumph.**

4 h.p. 1914 Triumph, 3-speed model; £40; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X9459]

TRIUMPH 1916 Countershaft Models in stock.—Marston, 26 and 31, Bridge St., Chester. [X9499]

TRIUMPH, engine, belt, handle-bars, pulley, tyres sound, magneto; £26.—Lyell, Bank, Montrose. [8661]

TRIUMPH, 3½ h.p. free engine, all accessories; £18; bargain.—Marston, 26 and 31, Bridge St., Chester. [X9498]

GENUINE Triumph Motor Cycle, new tyres, guarantee running order; £10.—Ewen, King's Lynn. [X9633]

TRIUMPH, T.T., 1911, absolutely perfect; £22.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [8677]

TRIUMPH 1914 4 h.p. T.T. Racer, Philipson pulley, nearly new, accessories; £45.—Newton, Chapel St., Penzance. [8690]

BROOK, Motor Cycle Specialist, Burnham, Som., has a few 4 h.p. 3-speed Triumphs for sale. Write to-day for list. [8578]

TRIUMPH, 1908, good condition, B. and B. Bosch mag., Brooks saddle; must sell; 12 gns.—32, Brixton Rd., S.W. [8630]

TRIUMPH, 1910, Lucas lamp, horn, tools, excellent condition; £19; owner enlisted.—24, Queen's Rd., Twickenham. [8621]

1910 3½ h.p. Triumph, new tyres and piston, lamps, tools, and speedometer; £20.—H. Wright, Arlesey, Beds. [8758]

1914 Triumph, like new, 3-speed, Sturmy, clutch model, coachbuilt sidecar; £55.—Scudder, 36, Gresham Rd., Brentwood. [8670]

TRIUMPH, 1916.—We hope to shortly deliver a few countershaft models, book your order now.—Layton's Garage, Bicester, Oxon. [X9556]

TRIUMPH, 3½ h.p., good running order, new belt and Palmer tyre, accessories; appointment; £20.—59, Raynton Rd., Enfield Wash. [8836]

TRIUMPH, 4 h.p., 1914½, 3-speed Sturmy hub gear, Lucas lamp, spares, coachbuilt sidecar, exceptional condition; £48.—Heywood, Brede, Sussex. [9630]

1913 3½ h.p. 3-speed Triumph, with Canoelet coachbuilt sidecar; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0734]

TRIUMPH, 4 h.p., 1914½, 3-speed, condition and tyres as new, Lucas lamps, generator, speedometer, etc.; £47/10.—Fordick, Halliwell, Minster, Ramsgate. [8625]

TRIUMPH, 3½ h.p., free engine model, in good condition, complete with lamps, horn, and speedometer; what offers?—R. E. Jordan, Goldthorn, Wolverhampton. [X9358]

TRIUMPH, 1911, clutch model, excellent condition, new belt, good tyres, Dunlops; £25; any examination; owner enlisted.—W. Lucas, Long Buckby, near Rugby. [X9398]

TRIUMPH, 1914½, 4 h.p., semi-T.T. roadster, fixed gear, only run 700 miles, perfect order throughout, guaranteed; £38/10.—5, Parade, Belmont, Surrey. [8693]

1911 Triumph, free engine, complete with Lucas lamp and horn, splendid condition, including tyres; £20.—Colmore Depot, 31, Colmore Row, Birmingham. [X9313]

TRIUMPH, 1914, 4 h.p., 3-speed, clutch, and cane sidecar, Cowey, Lucas, spare tubes and belt, perfect order; £47.—Lammermuir, West Heath Av., Solder's Green. [8737]

TRIUMPH, late 1914, 4 h.p., 3-speed, and Philipson pulley, Canoelet sidecar, Lucas accessories, first-class condition; £55.—Bode, 97, Bankes Rd., Small Heath, Birmingham. [X9067]

1913 3-speed Triumph, with brand new 17 gn. Gloria sidecar, luggage rail, all accessories, perfect; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0720]

1914 Triumph, 4 h.p., 3-speed, new Dunlops, Brooks saddle, lamp, horn, engine guaranteed perfect, outward condition as new; £42/10.—Robinson's Garage, Green St., Cambridge. [0648]

TRIUMPH, 1911, 3½ h.p., Canoelet sidecar, N.S.U. 2-speed, lamp, horn, luggage carrier, perfect condition, first-class turnout; cost over £80, sell £35, or offer.—70, The Grove, Bedford. [X9286]

1913½ 3-speed Triumph, special 1915 8 h.p. Armstrong hub, with sidecar, machine as new, little used, done 3,500 only, complete; £42/10, cost double.—Lord, 19, Mountfield, Prestwich. [X9344a]

TRIUMPH, 1912½, F.E., done about 7,000, tyres and belt very good, Cowey speedometer, tools, perfect condition throughout. £28; with Millford cane sidecar; £29/10.—Eric Barton, Shepperton. [8764]

3½ h.p. Triumph and coachbuilt sidecar. 1911. 2-speed gear, free engine, Bosch mag., splendid condition, powerful, fast, all accessories, nice combination; bargain, £23/10.—17, Bedford Sq., Stepney. [X9528]

TRIUMPH, 1915, type C, 4 h.p., 3-speed, not done 1,500 miles and equal to new, guaranteed perfect, fitted with new Canoelet coachbuilt sidecar, Cowey speedometer, Lucas lamp, horn, and tail lamp; bargain, £58, spot cash.—The Premier Motor Co., Aston Rd., Birmingham. [8838]

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26x2½ " " " heavy	24/6	34/-
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26x2½ Heavy Non-skid ...	35/-	42/-
26x2½ " " " "	38/-	46/-
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26x3 for 650x63 rims, Wood-Milne Combination .....	45/-	64/-
Extra Heavy 4-ply, 6/- each extra.		

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26x2½ .....	4/-	6/6
26x2½ .....	5/3	8/6
26x2½x2½ .....	5/9	8/9
26x3 .....	7/3	10/6
26x3 .....	8/-	12/6
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110 .....	1/3	2/2
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Special Heavy .....	15/-	Rubber
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**MOTOR CYCLES FOR SALE.**

**Triumph.**

4 h.p. Triumph, 1914, with 1915 improvements, Lucas large head lamp, horn, and rear lamp, fitted with Norton sporting sidecar, Cowey speedometer, very little used, enamel and plating as new; £260; any trial.—Simister, Jordangate, Macclesfield. [X9443]

TRIUMPH, 1913, 3½ h.p., 3-speed, 26x2½ Clincher Dreadnought rubberstudded tyres, special Gloria 223 model spring wheel sidecar, Lucas lamps and horn, very good condition; a bargain, £45.—The Premier Motor Co., Aston Rd., Birmingham. [8688]

TRIUMPH, November, 1914, 4 h.p., 3-speed, T.T. roadster, absolutely as new, plating and enamel perfect, the best second-hand Triumph offered, Palmer cords, 2½ in., knee-grips, scarcely used, very fast, and in every way perfect; £50.—S. Johnson, Bearded, Kent. [X9287]

#### Veloce.

1914 2-speed 2-stroke Veloce, complete with full range of accessories; £21/10.—Colmore Depot, 31, Colmore Row, Birmingham. [X9306]

#### Velocette.

VELOCETTE Latest Models in stock; £28/10 upwards.—Marston, 26 and 31, Bridge St., Chester. [X9494]

VELOCETTE, 1916, 2-speed, in stock; £36/10.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X9431]

#### V.S.

V.S., 7 h.p., and cane torpedo-shaped sidecar, 2 speeds, free engine, kick starter, head lamp and generator, Jones speedometer, horn, mirror, watch, etc., good running order; £55, or offer.—Stodart, 80, Rectory Lane, Tooting, S.W. [8827]

#### Westovian.

WESTOVIAN.—All models from £33 to £70; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8590]

#### Wooler.

SHOP-SOILED 1915 Wooler; cash or exchange.—A. J. Young, Newmarket. [8326]

#### Wolf.

WOLF, 2½ h.p., 1916 model, just delivered, 2-speed, 2-stroke, kick starter, hand-controlled clutch; £36/19/6; exchanges or deferred payments.—Eagles and Co., High St., Acton, W. [X9492]

#### Zenith.

ZENITHS.—1916 models at P. J. Evans, Birmingham Z Depot, immediate delivery all models, 87-91, John Bright St. [8784]

ZENITH, 6 h.p., 1914, and coachbuilt sidecar, in perfect order, speedometer; £45.—Percy and Co., 357, Euston Rd., London. [8716]

1911 6 h.p. Zenith-Gradua and Sidecar, splendid condition; £32, or lightweight and cash.—H. Wright, Arlesey, Beds. [8769]

ZENITH-GRADUA, 3½ h.p., good condition, accessories; £25, or nearest offer.—Jackson, Eastern Command Depot, Shoreham, Sussex. [8565]

1913 8 h.p. Zenith-Gradua and coachbuilt sidecar, 21½ spares, accessories, splendid condition, little used, nearest £45.—136, Dalmainy Rd., E. Croydon. [8706]

ZENITH, 1915, 8 h.p., sidecar, in good condition, Gradua gear, perfect running order, complete; £55, no offers.—G. W. Till, Central Garage, Bath. [X8399]

1915 4 h.p. Zenith Twin, with Gradua gear, lamp, horn, speedometer, etc., magnificent condition; cost £68, to be cleared at 40 gns.—Julian, Central Garage, Broad St., Reading. Phone: 1024. [X9326]

ZENITH-GRADUA, 1915, 8 h.p., clutch model, 2 months old, done 400, extra 3 in. tyres, unpunctured, Lucas set; cost over £84, brand new, £70.—Write, 2, Lebanon Park Mansions, Twickenham. [8564]

ZENITH, 1912, 3½ h.p., and sidecar, really good condition, new 2½ Dunlop back, new John Bull belt, latest Autoclipse, Rushmore generator, Lucas rear light, tools, spares; £52.—Beckwith, Hermitage Rd., Hale, Cheshire. [X9320]

NEW 1916 Zeniths from stock: 6 h.p. and 4½ h.p. countershaft free engine and kick start models; cash, exchange, and easy terms arranged. When dealing with Wauchope's your orders are assured to come satisfactorily through. Wauchope's are the oldest motor cycle dealers, and have a reputation for fair dealing.—Wauchope's, 9, Shoe Lane, London (by Ludgate Circus, City). [X9475]

#### Ladies' Machines.

DOUGLAS, lady's, 1911, free engine, clutch, handle start; £19/10.—Jones, c/o 52, Broad St., Worcester. [X9543]

LADY'S Douglas, 2½ h.p., 1913-1914, for sale, 2-speed, kick starter, speedometer, lamp, horn, spare belt, etc., tyres and belt practically new, ridden very little; £40, bargain.—Miss Rabbitts, Breach, Dummer, Basingstoke, Hants. [8555]

#### Miscellaneous.

SCOTT, 1913, £34; New Hudson lightweight, 1915, £27.—22, High St., Kingston-on-Thames. [8300]

LONGMAN Bros., 1, King St., Acton (Phone: 1578 Chiawick), have some excellent bargains, exchanges, etc. [8722]

## MOTOR CYCLES FOR SALE.

## Miscellaneous.

**PALMER'S** Garage and Motor Auction Rooms, 183, 185, 187, 189, High St., Tooting.

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**PALMER'S** Garage, Tooting.— $\frac{2}{3}$ h.p. Royal Ruby, 2-stroke J.A.P., reliable; £25.

**PALMER'S** Garage, Tooting.— $\frac{2}{3}$ h.p. Revere 2-stroke, 1915 model, as new; £25.

**PALMER'S** Garage, Tooting.—7-9h.p. Quadrant 1914 combination, countershaft gear; £40.

**PALMER'S** Garage, Tooting.—2hp. Moto-Reve, lightweight, £12;  $\frac{2}{3}$ h.p. Royal Enfield, £18; 5-7h.p. Indian, £25;  $\frac{2}{3}$ h.p. Torpedo Precision, £15;  $\frac{2}{3}$ h.p. O.K. J.A.P., 1915, £26.

**PALMER'S** Garage, Tooting.—7-9h.p. 1913-1914 Indian combination, £37/10.

**PALMER'S** Garage, Tooting.— $\frac{3}{4}$ h.p. Brown, low, handy machine, £10; 3h.p. Rex, £5.

**PALMER'S** Garage, Tooting.—2hp. Moto-Reve lightweight, £12;  $\frac{2}{3}$ h.p. Royal Enfield, £20; 5-7h.p. Indian, £25;  $\frac{2}{3}$ h.p. Torpedo Precision, £15.

**PALMER'S** Garage, Tooting.—4h.p. Douglas, 1914, 2 speeds, kick-starter, clutch; £45.

**PALMER'S** Garage, Tooting.—8h.p. Chater-Lea, 3 speeds, sidecar, clutch; £50.

**PALMER'S** Garage, Tooting.—4h.p. F.N., T.T. type, £12/10; 1h.p. J.E.S., £12/10;  $\frac{2}{3}$ h.p. 2-speed Douglas, £20.

**PALMER'S** Garage, Tooting.—Next Auction Sale 2nd February, at 2 o'clock. Catalogues free. Entries invited.—Sole address, Palmer's Garage and Motor Auction Rooms, 183, 185, 187, 189, High St., Tooting. Buses, trams pass doors. Railway stations, Wimbledon (L. and S.W. Ry.), only 20 minutes; Victoria, via Balham (L.B. and S.C. Ry.). [8849]

**EAGLES**—Enfield 6h.p. 1913 coachbuilt sidecar combination, perfect condition; £52/10.

**EAGLES**—Douglas, 1914, T.T. model V, 2 speeds, excellent condition, with accessories; £36/10.

**EAGLES**—New Hudson, 4h.p., 1913 model, with 3-speed gear, kick starter, with accessories; £32/10.

**EAGLES**—N.S.U.  $\frac{3}{4}$ h.p. Model de Luxe, 1913, loop frame, rear springing, 2-speed, free engine; £26/10.

**EAGLES**—Humber,  $\frac{3}{4}$ h.p., 1912, Mahon h.c. clutch, excellent condition; £19.

**EAGLES**—Calthorpe, 1915,  $\frac{2}{3}$ h.p., 2-stroke model, 2-speed gear, variable mag. control, only used 250 miles, as new; £28/10.

**EAGLES**—Douglas,  $\frac{2}{3}$ h.p., late 1914, model U, 2 speeds, new condition, with accessories; £39.

**EAGLES**—Any of the above can be had on approval. The Motor Cycle deposit system.—Eagles and Co., High St., Acton, W. Tel.: 556 Chiswick. [X9437]

**IF** You Want Bargains in second-hand motor cycles you can get them at Wauchop's, 9, Shoe Lane, Fleet St., London. [5624]

**1916 B.S.A. and Douglas Motor Cycles** delivered from stock.—The City Motor Cycle Depot, 44, Finsbury Pavement. [8506]

**SMART** Combination, 1914,  $\frac{3}{4}$ h.p., 3-speed, cane sidecar, well upholstered, lamp, horn, Sepspray, 38 gns.—Railway Garage, Staines. [8864]

**DOUGLAS** and B.S.A. Motor Cycles delivered from stock, just delivered from works.—The City Motor Cycle Depot, 44, Finsbury Pavement. [8506]

**BARGAINS**: must clear.—1914 Auto-Wheel, £8/8; 1912 Rex lightweight, Bosch, £11/10;  $\frac{3}{4}$ h.p. Triumph, £14/10;  $\frac{3}{4}$ h.p. 1911 2-speed Humber, £17/10;  $\frac{3}{4}$ h.p. 1912 Matchless, clutch, £18/10; Red Indian twin, clutch, £23/10; sidecars from 35/-; no others.—Please call, Liquidator, 10c, Waylett Place, West Norwood. [X8977]

**BATCHELOR'S** Bargains.—1915 B.S.A., 3-speed, coach sidecar, £55; 1914 8h.p. Matchless, 3-speed, and coach sidecar, all accessories, £65; 1914 5-6h.p. Rudge Multi and Swan sidecar, £45; 1912 6h.p. Enfield and sidecar, nice order, £35; 1915 4h.p. Douglas, T.T., with sidecar, £60.—Batchelor's, Clarence St., Kingston-on-Thames. [X8980]

**A FEW** 1915 new 2-stroke machines now offered at greatly reduced prices to make room for fresh models arriving daily. Sparkbrook,  $\frac{2}{3}$ h.p., 2-stroke, listed £35, for £29/10;  $\frac{2}{3}$ h.p. Royal Ruby, 2-stroke, listed £29/10, now going for £25/15;  $\frac{2}{3}$ h.p. Radoce, 2-stroke, 2-speed, listed £33/10, for £29.—Calthorpe, 2-stroke, 2-speed, listed £32/10, for £29/10; single gear, £29, for £26/10. Note, all the above are brand new machines carrying full guarantee, but only slightly shopworn. First cheque secures any of above. Money returned if not satisfied.—Alexander and Co., Scotland's Largest Dealers, 115, Lothian Rd., Edinburgh. [8257]



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B.S.A., Model K	£62 0
B.S.A., Model H	£64 0
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INDIAN, Powerplus, C	£75 0
JAMES 4 h.p. Combination	£80 10
NEW HUDSON Mod. C, 2-str., 2-sp., l.w.t.	£38 0
NEW HUDSON Big Six and Sidecar	£92 8
NEW HUDSON 4 h.p. 3-sp. Combination	£78 15
CALTHORPE-J.A.P., 2-speed	£37 10
ALLDAYS Allon, single-speed, 2-stroke	£34 0
CONNAUGHT, 2 1/2 h.p., 2-str., std. mod.	£35 3 6
IMPERIAL-J.A.P., 2 1/2 h.p., 2-speed	£36 15
LEVIS, Popular model	£32 0
LEVIS, No. 1, Enfield 2-speed clutch	£47 10
LEVIS, 1915, No. 1	£36 17
LEVIS, Popular models	£28 10
DOUGLAS, Model U, 2-sp., footboards	£50 8
ENFIELD standard Combination	£89 5
WOLF, 2 1/2 h.p., 2-stroke, lightweight	£25 8
ARIEL, 5-6h.p. 3-sp. countershaft Comb	£93 10
ARIEL, 3 1/2 h.p. 3-sp. countershaft Comb	£90 7
A.J.S., 4 h.p., Just in	£76 0
QUADRANT Combination, belt & chain	£72 10
HOBERT, 2-speed	£30 9
HOBERT, 2-speed	£36 0
FORD Delivery Van. Just in	£134 0

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1913-14 NEW HUDSON 3-speed Combination, Canoelet Sidecar	£49 10
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1912 B.S.A., cl. model, Montgomery Sc.	£33 0
1913 TRIUMPH, 3-speed, Clincher tyre	£41 10
1915 CALTHORPE, 2-stroke, shop-soiled, never used	£25 0
1915 CALTHORPE, 2-stroke, 2-speed	£29 0
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1914 NEW IMPERIAL 2-sp., vari. ign.	£25 0
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## SECOND-HAND CARS.

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**1915** 7-9h.p. Harley-Davidson; £78.

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**1915**  $\frac{2}{3}$ h.p. J.A.P.-Imperial, 2-speed, and kick-starter, variable ignition; £44/4.

**1915** Wolf 2-stroke,  $\frac{2}{3}$ h.p., 2-speed; £33/10.

**1915** Wolf 2-stroke,  $\frac{2}{3}$ h.p. Peco engine; £35/16/6.

## SECOND-HAND Bargains:

**1915** 8h.p. w.c. Williamson Combination; £80.

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**THE** Above are all really good and genuine bargains, fit up with lamps, horns, etc., ready for the road.

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# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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## Editorial Offices:

Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
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## Northern Offices:

199, Deansgate, Manchester.

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## The Case of Disabled Motor Cyclists.

**T**HE fact that approximately twenty million pounds has been subscribed to the various war funds reflects in no unmistakable fashion the spirit of our people. But funds do not exhaust the good work which is quietly proceeding in the ultimate interests of our fighting men. Committees, whose special work it is to study the conditions of men who return home from the war permanently disabled, have, perhaps, the saddest work of all. It is a subject we have dealt with before, as nothing can be more impressive or more likely to arouse the innermost sympathies than the sight of a finely built fellow who has suffered the loss of a limb in his country's cause. It is obvious that many such men will be unable to follow their previous calling in life by reason of their disabilities, and their welfare is a cause in which those able to do so should interest themselves without delay. Consequently we are very gratified indeed to note that a scheme outlined by our parent journal *The Autocar* to provide co-operative assistance for such men, particularly in the matter of finding suitable work, was adopted readily and enthusiastically by a preliminary gathering at the R.A.C. last week. Those present were representative of all the leading bodies connected with the motoring movement. The cause is such a noble one that it was only fitting that all the societies, representing manufacturers and traders as well as the private side of motoring, should have lent their aid to preserve that cohesion of effort which spells success to any huge enterprise of the kind.

The interests of motor cyclists will be well looked after by the Auto Cycle Union, whose particular work it will be to examine the cases of men who before the war, or during the war, were connected with the motor cycle. For every such man, who is permanently disabled by the loss of a limb, it will be a duty and a pleasure to find some work properly suited to his

capacity, and here the advantage of co-ordination of effort will be reaped, for motor cyclists, in the main being young and adaptable, will have the opportunity of taking up work in connection with each and all of the different spheres of motoring. Every true Briton will wish the new scheme success. It has been adopted not a moment too soon, for it is conceivable that, with the magnificent response of motor cyclists generally to the call of their country, the percentage of disabled men requiring special treatment will increase. The Government pension is not adequate, welcome as it will be, and must necessarily in many cases be insufficient unless the disabled man can secure employment to supplement it.

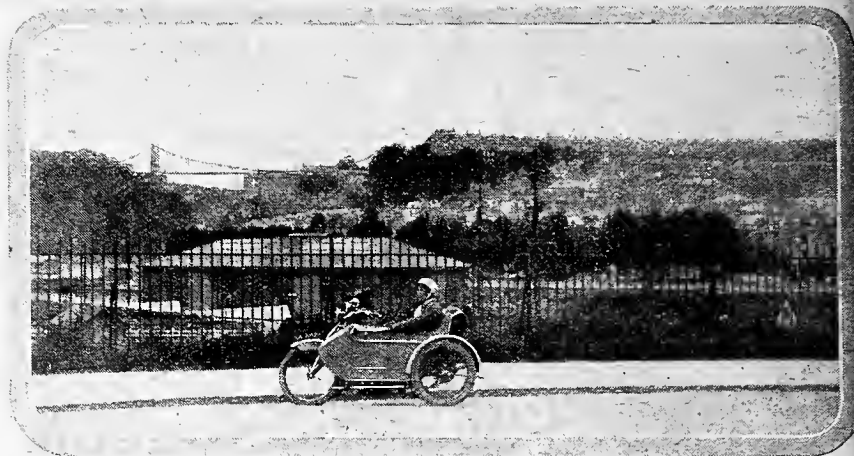
## Obstacles to Overseas Trade.

**F**URTHER proof has reached us from different quarters that our remarks in the last issue on the subject of exports of motor cycles were not untimely. There is not a manufacturer to-day but is ready, and indeed anxious, to carry out Government proposals in any attempt to assist the country, and, whether the Board of Trade knows it or not, its appeals to traders to specialise on Overseas orders have been supported enthusiastically in the motor cycle world. We have evidence that every maker has come to regard the exportation of at least twenty-five per cent. of his output as of paramount necessity. Some of the larger firms have actually gone further than this, and we have already mentioned the patriotic offer of a firm to export the whole of its production if the necessary facilities can be obtained. We find on enquiry that there exists in the minds of manufacturers something approaching indignation that obstacles should be placed in the way of exports; probably the exposures of the heavy North Sea traffic in foodstuffs have been the means of creating the discontent. Be that as it may, quite a number of firms have to wait long periods for licences to export.



# THROUGH FIFTEEN COUNTIES

## *A War-Time Sidecar Tour*



Clifton Suspension Bridge from the Bridgwater Road.

I WAS forced to forego a tour in 1914 owing to the outbreak of war, but in 1915 the need of a few days' rest could be put off no longer, so early one Saturday morning last August I set out on a 4 h.p. single Bradbury and sidecar for a trip to the South from Manchester. After a non-stop run to Shrewsbury, we ran into a heavy downpour of rain, but, thanks to oilskin coat and waders, the journey was continued: the passenger, protected by a storm apron and small umbrella with short handle, suffered no inconvenience. A few miles further on some fellow tourists mounted on a similar powered machine were overtaken, but their heavy sidecar with hood and screen told its tale, and after a tussle we managed to give them the slip on the next hill. A stop at Leominster for lunch was acceptable after forty miles of mud and rain.

The rain now ceased and we had a pleasant run into Gloucester, where, on the outskirts of the city, a cottage was found where tea was provided and an amusing half-hour was spent examining numerous wind-propelled images on poles, made by the tenant, to scare birds away from the fruit trees.

Once more on the road, the first puncture of the season was experienced—a nail in the front wheel; this was soon put right, and a run of a few miles brought us to Almondsbury, a delightful spot near Bristol. Here we put up for the night in a modest

and well-kept hotel on the main road, commanding a fine view of the River Severn in the distance. We covered that day about 180 miles.

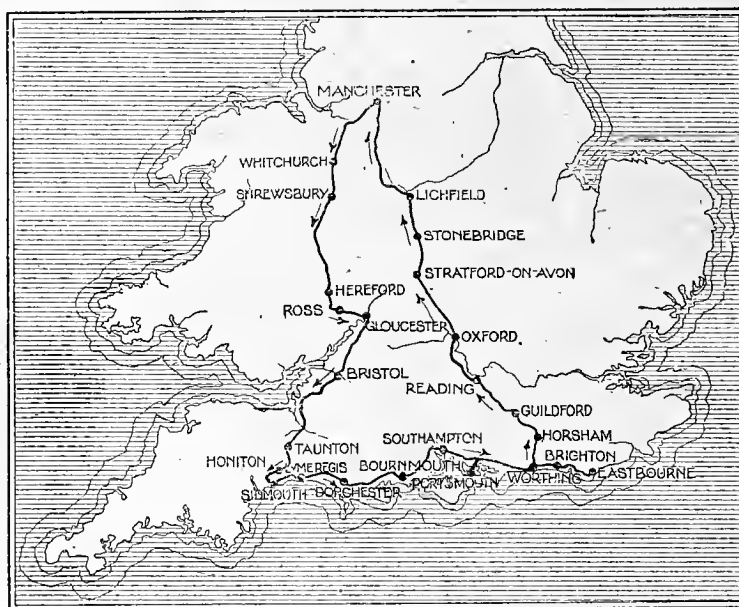
### Photography Banned.

Next morning, skirting Bristol, we found ourselves on the Bridgwater Road, where we met with a reminder of the war in the shape of military guard, who threatened court martial if the camera were not at once put away. Naturally we complied and continued our way through Bridgwater and Taunton, where some motor cycle machine gun outfits were seen. A turn here was made for Honiton via the Blackdown Hills—seventeen miles of very hilly country. However the second gear proved low enough for these hills, but on the nine mile run to Sidmouth the low gear was required for the first time on a hill where a motor car was seen towing a solo motor cycle.

The views of the Devonshire hills here are perfection, so a roadside lunch was very much enjoyed.

The second night's stop was made at Sidmouth, where many beautiful spots may be visited afoot, and a pleasant afternoon and evening was enjoyed, the only regret being that the military and naval guards prohibited any photography.

Making an early move eastwards next day, we ascended Trow Hill—another local terror. The hilly coast road to Lyme Regis called for caution and



Map showing the route taken by H. W. D.

through Fifteen Counties.—

Good brakes, after which the road through Bridport and Dorchester seemed monotonous. We therefore appreciated the change when Bournemouth and Christchurch were reached, and enjoyed a glorious run through miles of forest and splendid roads to Lyndhurst. We made Southampton our headquarters for the third night. This place proved most interesting, reminding one of Chester with its old walls and bar gates.

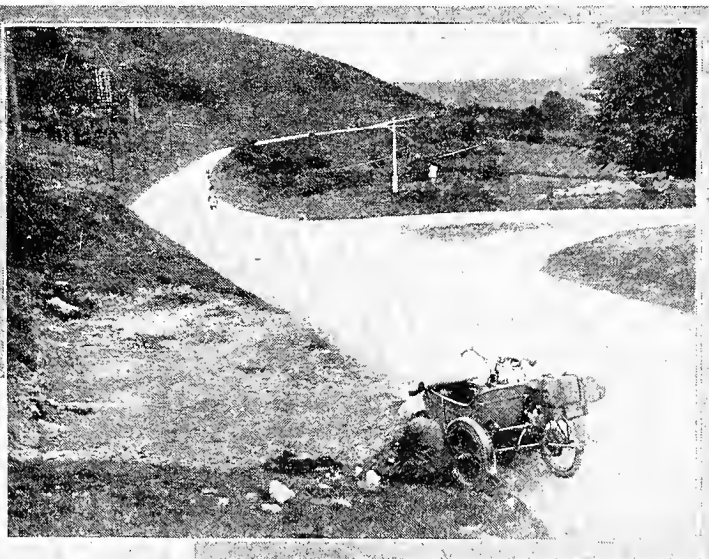
Before resuming our journey the slack was taken up in the rear chain. We left the town by the floating bridge, and a seventeen miles run brought us to Portsmouth, where many interesting sights are closed to visitors owing to the war, but Nelson's flagship, "The Victory," can be seen from the shore. Passing through Havant, Chichester, with its many ancient buildings, and Arundel, where we stopped to visit the castle, we arrived at Worthing, famous for its sunshine.

A five-days stay here allowed of many trips along the coast to Brighton, Eastbourne, and other places, including Shore-

ham Aerodrome, a few minutes run, to see the army flying men at work. The fig tree gardens at the old-world village Tarring, founded by Thomas à Becket, were in full fruit and are worth a visit.

After a crowded five days, the return journey was made by the way of Horsham, Aldershot, Odiham, Reading, and Pangbourne (near here the road runs along the riverside for some distance) to Oxford, where a stop was made for tea. The road out of the city of Woodstock was horribly bad, but then followed a ride through some lovely scenery to Stratford-on-Avon, where it was a relief to find the streets lighted at

#### FAR AWAY FROM THE RAVAGE OF WAR.

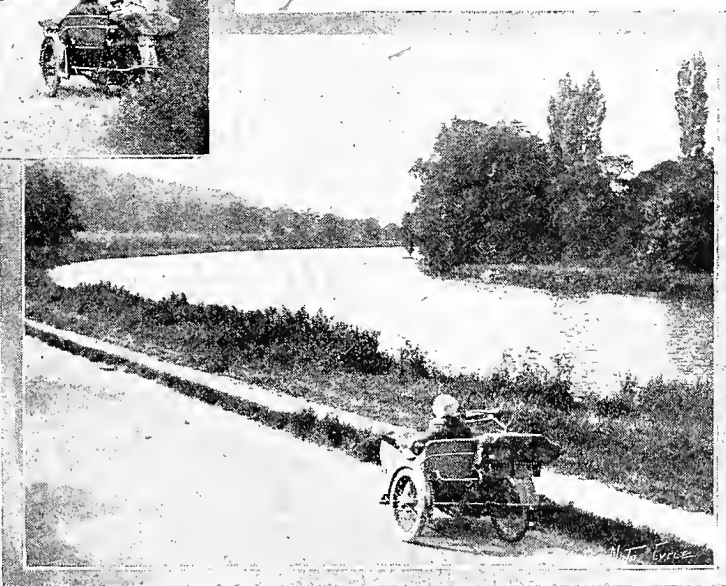


A fine stretch of road between Bristol and Taunton.

was the only adjustment. Thus ended a most enjoyable and health-giving tour through scenery as varied as it was delightful. H.W.D.



A quaint inn on the Blackdown Hills between Taunton and Honiton.



Near Pangbourne—a Thames Valley beauty spot.



### Starting a Four Cylinder.

During my first trips on the Henderson four-cylinder I regarded engine starting as something of a nuisance, seeing that I am still a devotee of first-class tune and the push-and-run, as opposed to the kick-starter, and the four-cylinder has no valve lifter. I subsequently learnt wisdom. Once the four-cylinder is warm, there is no need to dismount, put the machine on the stand, and wind at the handle. I just put my right hand down behind the calf of my right leg, pluck the handle out of its grip, engage its dog, and twitch it gently upwards, when the engine invariably responds. Of course, the 1916 Henderson has a kick-starter, in lieu of a handle, and I am ready to bet my boots that there is no easier starting engine in the universe.

### Time the Healer.

An expert motor cyclist writes with withering indignation of the appallingly bad two-strokes which have been palmed off on many army officers for urgent use on military duties. I quite admit that some frightful rubbish has been bought at absurd prices by ignorant subalterns, but I do not know that any very great harm has been done. The machines, though bad in many cases, will go, and keep on going, and are quite equal to the pottering duties required of them about camps and training grounds, though less suited for the cross-country trips to visit the best girl on week-end leave. In any case, they were usually the only machines available, the better-class firms being busy with more important work. If anybody has a grievance, it is the unfortunate purchaser who buys at an outside price, and has to unload as best he can when he is ordered abroad; but this grievance has hardly arisen yet, for as far as I can perceive, the original buyers are disposing of these caricatures at nearly their original price to greener and more newly-joined "subs.," and when the war is over, and the relics are thrown on the market, they are not likely to be worth more than they will fetch! No anxiety need be felt about the future.

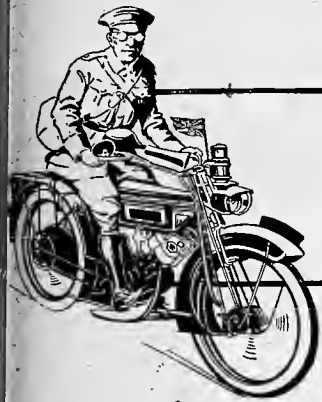
### When Insulating Tape is Handy.

Gentle reader, it is always a dangerous thing to be what the Yanks call a "highway incinerator," but doubly so when you indulge your speed foibles at night, and burn electricity. The other night I was drilling a head gale at 30 m.p.h. along a road which I barely know. Suddenly I got the needle about my electric lighting outfit, some details of which I knew to be shoddy. I soliloquised, "What if the head lamp suddenly dowses the glim!" I pulled myself together, rebuking my coward heart for age and nerves, and reopened the throttle, when, sure enough, the head lamp promptly went out. Machine and I together charged over a turf kerb, and rocketed about on the rough grass of the Wiltshire downs for a breathless eternity, before I could pull up. A wire had merely

shaken off the battery terminal. When I reached home, I invested in a shillingsworth of insulating tape and lashed every connection on that lighting circuit until the studs lay hidden beneath shapeless heaps of coagulated tape and adhesive. My awesome experience can now only be repeated if a filament goes.

### Noise a Safeguard.

With all due deference, I beg to repeat that I am quite seriously and deliberately an advocate of moderately noisy motor bicycles. In this matter I probably fail to represent the opinions of my colleagues on the staff of this paper, of the motor cycling authorities, of the trade magnates, and of the riding public in general. But I still stick to my guns. The average pedestrian has a child-like trust in motorists—he rarely troubles to dodge us, but is certain we will do our best to dodge him; and he steps blandly off the kerb into the road with his eyes glued to the latest *communiqués* from Paris. The roads are becoming crowded with motorists of little experience, less imagination, and no judgment. I ride month in and month out, in all parts of Great Britain on all kinds of motors; and I become daily more impressed with the perils which beset the habituated motorist, daily more pessimistic about the common sense of the average pedestrian, the average cyclist and a vast number of motor car and motor cycle owners. Though I call myself (thanks to a certain imagination and a very prolonged experience) rather a resourceful and sensible driver, I have had squeak-innumerable during the past twelve months. My knowledge, my judgment, my control of my vehicles and my caution are all steadily ripening; yet each year brings an increasing ratio of hair-breadth escapes. I am unwilling to dispense with a single safeguard, and I find a moderate and continuous noise the best insurance for my vehicle and its occupants. I drive far more slowly and cautiously in populous areas than I ever dreamt of driving years ago; I employ the most penetrating alarms that ingenuity can discover or money can buy; and still—I am sure of it—the risks show a tendency to increase. Finally, from time to time, I may chance to take out an absolutely inaudible Rolls-Royce or big Matchless, with its *pianissimo* sibilant hiss as it runs throttled down to the pilot jet. On such days my remaining hairs assume an absolutely vertical attitude, and a large percentage of these survivors tend to bleach themselves rapidly. And—here's the crown of my argument—the silent motor cycle is infinitely more dangerous than the Rolls-Royce. The latter is at least big enough to catch the tail of a road-user's eye; when he is walking recklessly at an angle across its front; but the cycle is as unassuming in bulk. By all means give me a pedal which will silence the engine temporarily when I pass the tan strewn outside a sick room, when I flit past a place of worship on Sunday, or when I overtake a funeral; but for all ordinary purposes, give me noise, and plenty of it.



## SIGNALS.

An Account of the Work of a Despatch Riders' Section  
from the Officers' Point of View.

**A**FTER this war the learned in such things will have to write a treatise on the psychology of the motor cyclist, for indeed he does things entirely without parallel, as will be confirmed by those whose lot it has been to control any number of these enthusiasts.

In the far-away beginning, the writer first encountered the individual who is termed a "despatch rider" (irrespective of his actual job) by meeting a real "Knut" slowly pushing a Douglas within one of His Majesty's dockyards. From the Douglas depended the brake rod, while the carrier appeared distorted, and, from everyone having authority, the "Knut" was requesting the whereabouts of the nearest garage. To him presently came an inflamed petty officer wanting to know why the, where the, and how the, he (the Knut) came to be in such a situation, and whether the lost one thought that dockyards contained garages for withered, singed, and blistered people newly imported into His Majesty's Service. All the "Knut" would say was, "Well, I always get a garage to do my repairs."



The rim of a 17in. shell hole and the remains of a railway station at Ypres.

Later it fell to the writer to see a great deal of twenty-eight enthusiasts provided with a number (never twenty-eight) of Douglases; indeed, it was seldom that the enthusiasts themselves would tally off to the required number, some always being in trouble. Now when a detachment departs to the unpleasant parts of France or Belgium, there is generally much to interest a student of human nature, and in the course of a prolonged stay a thousand small details show of what types are the men one has to look after. In our case

the motor cyclist was so necessary that without him, several of him, we were lost. He fetched the letters daily, going sixty miles to do it, carried reports of our little fights, demands (constant demands I may say) for further supplies, traced lost supply columns to their place of concealment, and fetched newspapers, bootlaces, or tinned delicacies from the nearest town. Moreover, he lay in ditches while the cars sent shell after shell over his head, slept with the gun crews in ice-cold bivouacs before action, and staggered up shell-pitted roads under a load of ammunition boxes on dark nights when the air was full of bullets. My orderly was one such man; he cooked omelets to perfection, "foraged" for wine, helped me steal a bed for a deserted billet, and generally was indispensable.

### The Idiosyncrasies of Riders.

Thus our twenty-eight enthusiasts were hard worked all the time, and, being hard worked, had some amusing failings. Firstly it must be explained that some of them knew very well what a motor cycle was, while others had merely a vague idea, and it was this mixing of mechanic with ex-private owner that caused trouble, as the mechanic had to be watched every second else he would "tune" his machine on a system of his own, while some of the others must be equally minutely observed or they would destroy their machines through neglect of detail adjustments.

Now, one thing that all came up against was the fact that the riders never realised the machines were not their own. Moreover, the authorities, however foolishly, insisted that these machines *were to be kept as delivered*, setting apart divers horrid penalties for those who would break this rule. Consequently one's "spare" time was taken up inspecting bicycles, and never an inspection came to a conclusion without trouble. One man, for instance, had become annoyed with the forward Douglas footrests, and had sawn them off, opining that the machine looked better. When wrath unlimited fell upon him, he would stand with open mouth and protruding eyes bereft of explanation. Another had "tuned" up by removing the end of his silencer, and yet another, peevishly, had thrown away his carrier, while a particularly "hard case," disliking the familiar Douglas T.T. bars, in some mysterious manner had put his through a fire and altered them to an exaggerated Brooklands form.

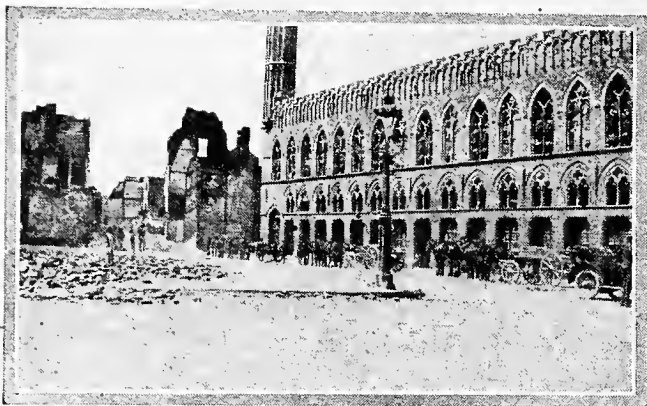
As to the smaller details which go to make a machine, one man fitted an adjustable pulley and threw away the Government one. Several people "did without" an ignition control, while saddles and tool kits were a perpetual source of bickering.

Naturally there was trouble, and the enthusiasts were astonished to find that the Government did not



**Signals.—**

want its bicycles "tuned," altered, or even painted a different colour, vexing the souls of motor cyclists who did these things, and bombarding the O.C. with official correspondence which threatened to continue for the rest of his life. They even rudely insisted on the removal of all the additions and the replacement



Part of the Cloth Hall at Ypres, which has probably seen some of the worst fighting and shelling on the British front.

of the original details, failing which they desired payment for the missing members.

As to equipment, I do not believe that there was one cyclist in the squadron who could keep his personal belongings for three days on end, while some of them lost even their rifles, with dire results. Another peculiar trait is that no motor cyclist conceives himself to be impregnable until he has both a rifle *and* revolver. That is to say, if he has a rifle he wants a revolver, and if he has a revolver he beseeches one to let him have a rifle.

**Revolver Practice.**

Now, for my sins, I had made a small range for Maxim instruction, and in a weak moment gave out that those having revolvers or pistols might practise in the evenings. At five o'clock I found a long line of the most peaceable motor cyclists, each with his most ferocious expression and an enormous "hand cannon" dated somewhere about 1870, while our best storekeeper (who incidentally was Crompton of cycle car fame) grasped a minute automatic which I knew from experience jammed every four rounds. However, as there was no time to bring an armoured car for me to sit in, at it we went, and for ten minutes the air was full of noise, smoke, and flying cartridges. Fortunately there were no casualties, but the erratic firing of the elderly weapons, combined with the fact that nearly all the flash came out of the rear end of the chambers, satisfied everyone, whilst Crompton, as usual, retired early to unjam his favourite weapon.

So much for the peculiarities of the motor cyclist. Comes now his riding. In this he may be divided into three classes—those who rode as if for a record and were properly chastised when we discovered their actual speed, those who rode slowly and always got there, and those who could not ride five miles without getting off and playing with their engines. The latter class contains, I fear, too many of the mechanics, and, moreover, it interfered with the arrival of their mes-

sages, however much it may calm their souls by restoring the pristine Douglas bark. The second class did real good work, and the first, as I have said, knew trouble. From this you will see that one's own motor cyclist despatch riders were a handful enough to occupy any man's leisure moments, and something of a worry to the thoughtful, but they were as nothing to the D.R.'s of other people.

**Night Messengers.**

Indeed, when one was away trying to sleep in what the shells had left of a house the purr of a Douglas got on one's nerves. As surely as the rain would haze the view and make dark puddles upon the floor, so surely would a damp individual roar up to the billet just as one had turned into the inevitable "flea bag" for the night. All sleep would then vanish as the machine spat and banged while pulling up, and, with a sense of intense irritation, one had to light a candle, search for watch and pencil, and await the rider. The latter, when he does come, drips puddles over one's bed while he fumbles through his leather despatch case, eventually producing either the *communiqué* for the day, in which case all is well, or orders to move to some appalling place twenty miles away. You then sign, and the malignant visitor climbs on his machine and goes off to worry someone else. In time you get so nervy about messages that the mere noise of a motor cycle engine in the distance wakes you out of as sound a sleep as may be obtained in a bag on the floor.

Thus there is much to be said for one man who solemnly swore that when the war was over he would buy a house with a huge and cosy bed, also a motor cyclist, whom he would train to rush up at various hours during the night, come into the room, salute and say, "Message from the General, sir," to which our friend would make answer, "Tell the General to navigate to the extreme boundaries of the underworld," and turn him over to sleep.

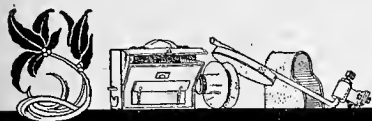
Altogether, our despatch riding friends were very interesting study and show that the average motor cyclist has the happy knack of quickly adapting himself to whatever he puts his hand to. S.H.D.



A BRITISH MACHINE USED BY A FRENCH MILITARY CYCLIST.

M. Armand Singer, who is attached to the 269th Section T.M. of the French Army, and the 3 h.p. Royal Enfield he has ridden for many months.

## ACCESSORIES



- (1) Accessories.
- (2) Sidecars.

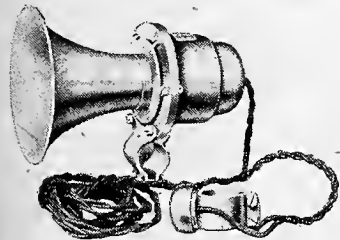
- (3) Tyres and Clothing.
- (4) Ignition Appliances and Lamps.

## IN FOUR SECTIONS.

The review of new sidecar designs and accessories in the following pages comes at an opportune moment, when machines—many second-hand—are being fitted up in anticipation of spring. It does not profess to be complete, but nevertheless readers will find much to interest them in the mass of information and illustrations which we have compiled.

**Apollo Motor Cycle Electric Horn.**

Among the many motor cycle accessories sold by the Apollo Mfg. Co. is the motor cycle electric horn. This is very substantially made. As it is designed to take a very small amount of

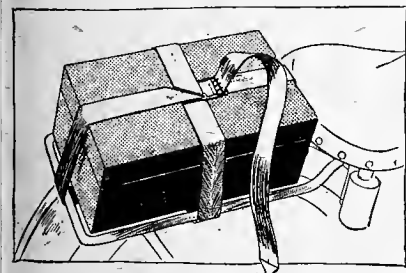


current, it being stated that  $\frac{1}{2}$  amp. is the maximum amount taken, it may be worked by a dry battery carried in a leather case. The wiring is of the two-wire pattern, in order to avoid any risk of short circuit in wet weather.

Apollo Mfg. Co., Moseley Street, Birmingham.

**The Doubleway Strap.**

Motor cyclists often have a difficulty in strapping a parcel on to a motor cycle carrier. A device which will be of considerable utility for this purpose is the new Doubleway strap lately placed on

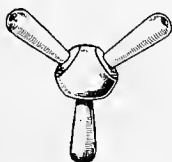


the market by Messrs. James Grose, Ltd., 4, Old Jewry, E.C. The strap is enabled to hold the box at four points owing to the ingenious design of the special buckle employed. The strap is made of webbing, and can be had in any size.

James Grose, Limited, 4, Old Jewry, London, E.C.

**A Three-way Connection.**

A useful accessory manufactured by the Leicester Rubber Co. is a three-way connection made of brass for connecting rubber tubing. It enables the head lamp and tail lamp to be operated from the one generator. The rubber tubing manufactured by this firm is also worthy of notice. It is stout and practically "unkinkable," yet at the same time very flexible. It is specially suitable when long lengths of tubing are used. The



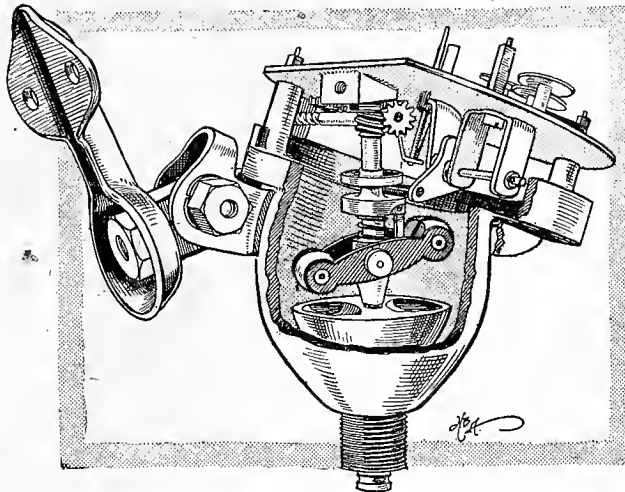
Leicester Rubber Co. are the makers of the well-known John Bull tyres, belts, and repair outfits.

Leicester Rubber Co., Ltd., Granby Rubber Works, Leicester.

**Dover Grips.**

Among the many useful fittings made of Exonite by Messrs. Dover, Ltd., is a neat hook end handle grip. The hook of this grip is integral with the body of the grip, and therefore cannot break away; it is secured to two metal rings incorporated in the exonite shell, so that any strain thrown on the hook is taken by the bar when fitted.

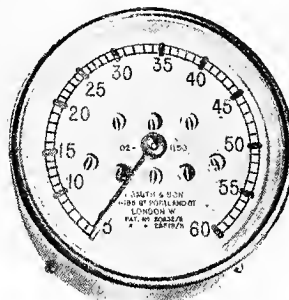
Dover, Ltd., Northampton.



Interior mechanism of the Smith speedometer.

**The Smith Speedometer.**

Messrs. S. Smith and Sons are the actual makers of a very excellent speedometer, which works on the centrifugal principle. The interior mechanism is slightly different from that found on others, and a few words concerning its



working may be of interest. The governor, which is provided with a cup-shaped flywheel, has a sort of gyroscopic action, which ensures steady running. The governor itself, which is fixed to the spindle and revolves with it, consists of two steel cross members provided with brass weights at each end. As the speed of the spindle increases the governor

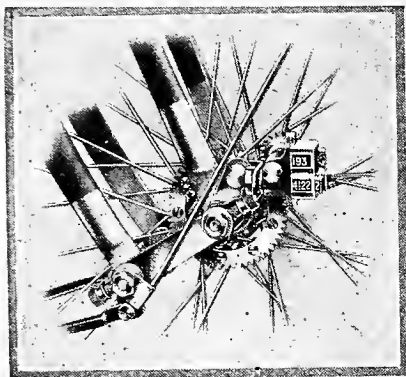
tends to assume a more and more horizontal position, and in doing so moves a double collar connected with the governor proper by means of a short shaft, which tends to pull up the collar and carry with it a spindle lying between two portions thereof, which, being attached to a toothed quadrant meshing with a pinion fixed to the spindle, conveys the motion to the indicator hand which is attached thereto.

Messrs. S. Smith and Sons, Ltd., 179-185, Great Portland Street, W.

## Accessories.—

## Some Useful Accessories.

Besides the well-known Jones speedometer, which was one of the first to be adapted for motor cycles, Messrs. Markt and Co. find the Veeder cyclometer to be a very popular instrument. The illustration shows this driven by the usual type of spur gearing, while inside there is a spiral gear. The type of spiral gear employed is shown in the illustration of the speedometer drive, on which it has been proved to be most



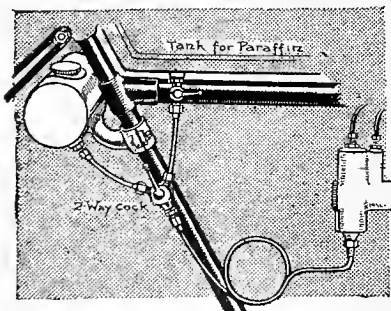
successful. In the least expensive type of speedometer bevel drive is used.

Another useful accessory sold by this firm is the Little Giant jack, which is exceedingly light, and weighs only 2lb., while when folded it only occupies 7½ in. It is quite suitable for sidecar work.

Messrs. Markt and Co., Ltd., 98-100, Clerkenwell Road, E.C.

## Binks Auxiliary Tank.

The Binks jet damping carburettor remains practically unaltered for this year. This carburettor, it is claimed, is such an excellent vaporiser that almost as good results are obtained with it with paraffin when the engine is once warm as with petrol, which at the present time costs more than twice as much per gallon. To assist in starting from



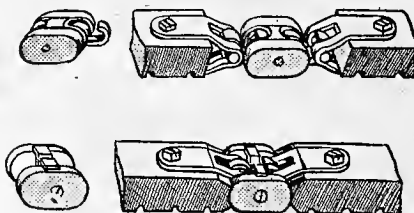
cold when either paraffin or the special cheap fuel sold by C. Binks and Co. at 1s. per gallon is used, the firm manufacture a small auxiliary tank to fit behind the seat tube, in which is carried a small quantity of petrol. This is conveyed to the carburettor *via* a two-way tap also communicating with the main tank. The cheap fuel is then carried in the main tank, and the tap turned

into communication with it after the engine has been warmed up on the petrol.

C. Binks, Ltd., Church Street, Eccles, Manchester.

## The Stanley Spare Link and Shield.

Users of belt drive who employ adjustable pulleys have found the Stanley spare link for the purpose of quickly lengthening or tightening a belt to be a very useful accessory, while another useful adjunct is the Stanley



Stanley spare link.

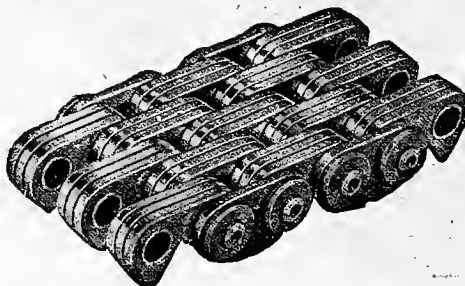
Stanley shield for the belt fastener.

shield, which protects the belt fastener and prevents wear of the pulleys. It has been specially designed for use with the Philipson pulley.

Messrs. the Stanley Motor Belt and Fastener Co., London Road, Bromley, Kent.

## Coventry Chains.

Among the many types of chains suitable for motor cycles, a type which is becoming increasingly popular, especially for the drive between the engine and gear



box of heavy sidecar outfits, is the silent pattern as manufactured by the Coventry Chain Co. Not only is the strength of this chain considerably greater than the roller type, but its silent running and extreme flexibility make it eminently suitable for short high-speed transmissions. For light work, such as dynamo drives and so on, where the ratio between the wheels reaches as much as 3-1, two special small 8 mm. and ¾ in. pitch roller chains are listed.

The Coventry Chain Co., Ltd., Spon End, Coventry.

## Albion Gears.

The Albion gear remains unaltered for the present, the last improvement effected being the addition of a control clipped to the top tube in place of the horizontal lever. The mechanism is extremely simple, the two gear ratios being obtained by sliding dog clutches actuated from the right-hand side through a bell crank. The box is sturdy, and the securing nuts are all on the right-hand face, where they are accessible, while the two studs

holding the box to the bottom bracket of the machine are set in strong lugs, there being a special aluminium clip

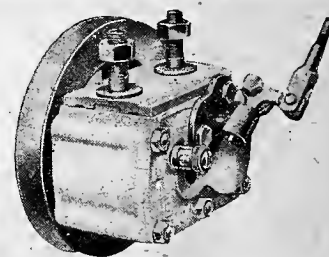
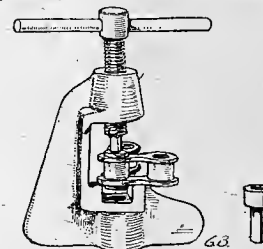


plate immediately below the nuts. The Albion gear is to be found on numerous makes of lightweight two-strokes.

Albion Engineering Co., Ltd., Upper Highgate Street, Birmingham.

## Renold Chain Punch.

In addition to their famous transmission chains, which are so well known that the name of Renold and chain are synonymous, Messrs. Hans Renold, Ltd.,

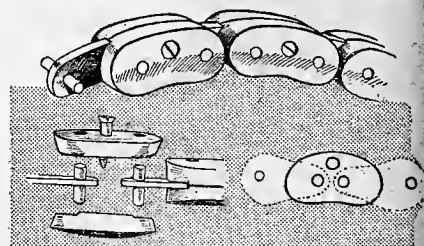


also list a very handy chain rivet extractor. The sketch is self-explanatory. The screw punch, pressing on the burr head of the chain rivet, forces it out of the side plate, rendering it a simple matter either to remove or replace a link or half link. The small drilled table is for placing in the base of the punch when riveting the chain, by means of which the rivet can be forced into place previous to being burred over.

Messrs. Hans Renold, Ltd., Didsbury, Manchester.

## Whittle Belting.

Although leather belts have gone much out of favour of late years as far as motor cycles are concerned, a belt which still remains popular for certain classes of heavy sidecar work is the Whittle. This belt consists of leather plates



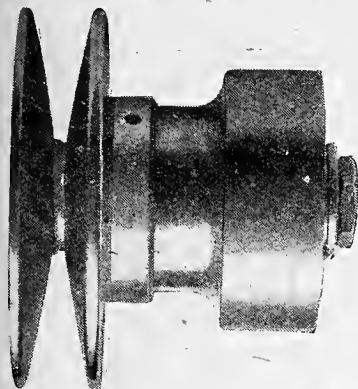
screwed together on steel connecting links forming a kind of belt chain. These belts are very flexible, require no fastener, and will drive when quite slack. They have become very popular for the purpose of driving dynamos, cooling fans on cars, and machinery.

Messrs. Thos. Whittle and Sons, Ltd., Warrington.

## Accessories.—

**Philipson Pulley.**

The Philipson governor pulley, which has gained such popularity among motor cyclists, has been improved by the



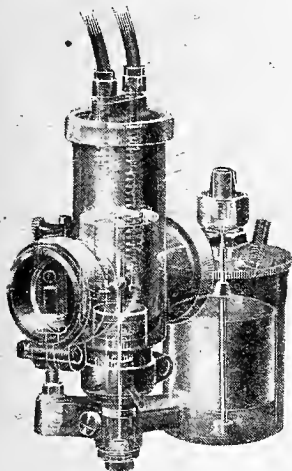
addition of a cover over the rubber buffer. The pulley in its latest form was described and illustrated as recently as January 18th, 1915, page 497.

Philipson and Co., Bolton.

**1916 B. and B. Carburetter.**

For 1916 the B. and B. carburetter is practically unaltered, save for the flooding button, the alteration to which was described recently. From the perspective drawing the outward appearance of this refinement can be gauged accurately, and the newer design is certainly neater.

As to the instrument, a slow running jet is fitted still, being housed in a separate small choke tube alongside the body of the carburetter; both air and throttle slides follow the older design, and have a long needle which, moving



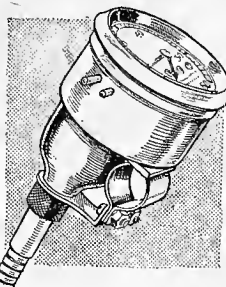
with the throttle, varies the jet aperture. Above the jet is a cylindrical "ceiling" perforated by numerous holes to allow the petrol to gain the throttle chamber after leaving the jet. As that air which passes the main choke tube and main jet also passes through these holes mixed with the petrol the mixture is atomised very thoroughly. The seating of the float needle is in the lid of the float chamber, and the operating gear reduced to float collar and needle.

Messrs. Brown and Barlow, Ltd., Witton, Birmingham.

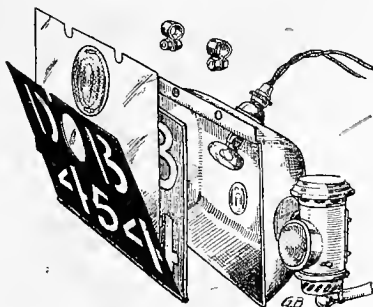
**The Watford Speedometer.**

Few speedometers in use on motor bicycles have met with a greater deserved degree of popularity than the Watford. Made by a firm noted for its exceedingly high-grade watches, the workmanship put into the speedometer, which works on the centrifugal principle, is of the very best, with the result that the motor cyclist gets most accurate reading and a very steady indicator hand. These speedometers can be had for front or rear wheel driving, and with and without watches attached.

Messrs. Nicole, Nielsen, and Co., Ltd., Whippendell Road, Watford.

**Illuminated Number Plate.**

A novel form of rear number plate is listed by W. O. Wood, of Stockport. This is so designed that it can be illuminated by means of an electric bulb situated behind the plate in which the identification numbers are cut, behind

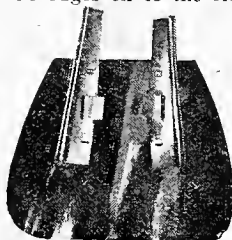


which is placed a transparent plate. A red glass is fitted in the centre, and access to the electric bulb is quite easy, the undoing of two nuts being all that is necessary. This contrivance overcomes the difficulty of the front number plate being insufficiently illuminated where the very stringent lighting regulations prevail. This number plate can also be illuminated by the usual acetylene rear lamp if desired.

Mr. W. O. Wood, Millgate, Stockport.

**An Effective Mud Shield.**

A very effective mud shield has been placed on the market by the Cycle Necessities Co. It is attached to the mudguard by means of steel clips which fasten round the edges thereof. It is claimed that when the mud splashes on to the mud flap it does not drain off the edges on to the rider's legs.



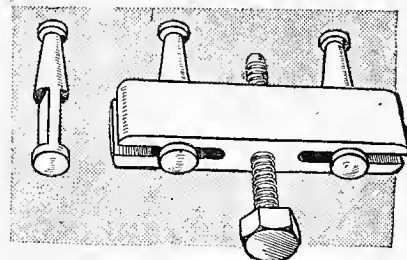
The firm make a speciality of studying anti-splash devices. One of these is the Mud Flap Stop, which, like the accessory just described, is clipped on to the guard itself

or the side stays by means of spring clips. The planes or flaps are parallel to the ground, and they can be brought in or out of use by simply a turn of the finger and thumb.

Messrs. the Cycle Necessities Manufacturing Co., Vine Street, Birmingham.

**Sprocket Remover.**

One of the most ingenious little tools we have seen lately is a sprocket remover, the working of which the accompanying sketch renders self-explanatory. The sliding pegs allow themselves to be adjusted to any size sprocket, and a very slight alteration in their shape would



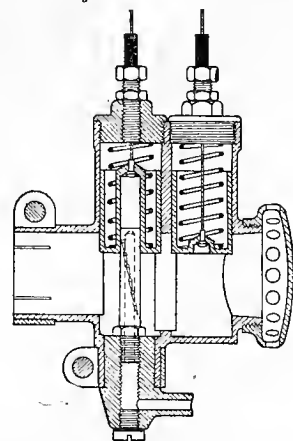
Bransom and Kent's magneto sprocket remover.

render them suitable for the removing of timing wheels.

Messrs. Bransom, Kent, and Co., Ltd., 40, Great Eastern Street, E.C.

**Everest Carburetter.**

This carburetter is now fitted with two lever controls, the air lever having been fitted to render starting from cold somewhat easier. Once the machine is warmed up, however, the instrument is in practice controlled entirely by the throttle, though the air lever at times proves useful on low-powered machines to prevent knocking when overloaded, by temporarily strengthening the mixture. The jet is of the multi-outlet

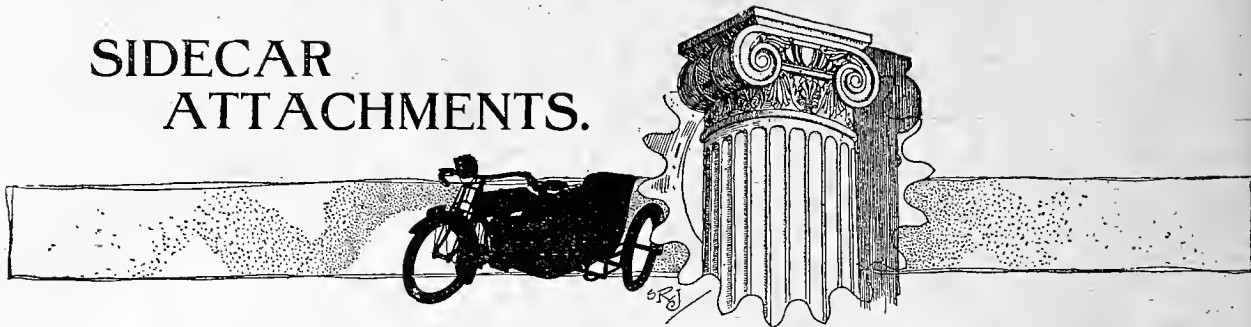


type, and is controlled by the throttle movement. The passage through the body is oblong in shape, being 12 mm. wide and 25 mm. long, which provides a port of large capacity, while the throttle and air slides are relatively small, the result being a very neat outward appearance. A specially small model is also made for use on small engines, such as Auto-wheels.

Everest Carburetters, High Street, Newport, Salop.



## SIDECAR ATTACHMENTS.



There is an abundance of variety in the design of sidecar attachments offered to the public, both in body and chassis design. The illustrations in the following pages exemplify that fact. Sporting sidecar attachments weighing from 48 lb. complete, and luxurious attachments scaling over five times that amount, are included in the range.

### Montgomery Sidecars.

Of the many models made by Messrs. W. Montgomery and Co. probably the two which will prove the most popular for this year are the double-seated model and "The Lounge." The double-seater is certainly a most luxurious attachment, and is specially suitable for machines with spring frames, as the axle is sprung independently of the chassis. The main chassis is suspended on shackles below the axle on two semi-elliptic springs, while, in addition, the body is separately sprung on comfortable C springs and the special Montgomery spring shackles at the rear, while the front is carried on two lever springs—a system to be commended. Four-point attachment is used, two being quickly detachable screw-up joints with locking devices, the other two being secured by pins, which are also quickly unfastened. The body is not unduly long, although ample room is provided for both passengers, who are seated tandem fashion, as by fitting a fairly deep well beneath the front seat to accommodate the back passenger's feet it is possible to shorten the body very considerably. Entrance to the rear seat is obtained by lifting the front one, which is detachable, and will fold up when not required. An adjustable windscreen is fitted, and a hood with long side curtains. Waterproof aprons are provided for both compartments.

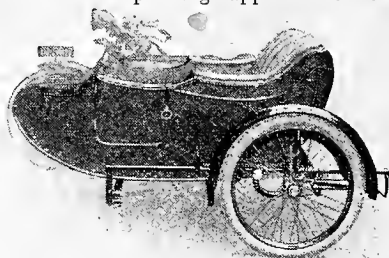
"The Lounge" model has an underslung chassis which is strong and light. The springing of the body is by C springs and spring shackles at the rear, while the Montgomery patent foot springing on lever springs is used in front. The mudguarding is excellent,

as the valance extends nearly to the axle. The body is provided with a dash, which can be lifted when entering or dismounting from the car. Attached to this is the adjustable windscreen, which can be folded right down when not in use. The upholstery of the body is very carefully carried out. The back of the body curves backward, not only giving a comfortable position, but providing considerable protection from dust.

W. Montgomery and Co., 87, Gosford Street, Coventry.

### The Gloria.

The Gloria sidecar, Model No. 5, besides possessing extreme comfort, has a neat and pleasing appearance. One



of the chief features of the chassis is the double head fitting for securing the front attachment to the cycle, whereby the strain is distributed evenly between the top and down tubes of the cycle frame, so considerably strengthening the steering head, yet at the same time the quickness of detachability is in no way affected. Another point is the spring wheel, which has been a

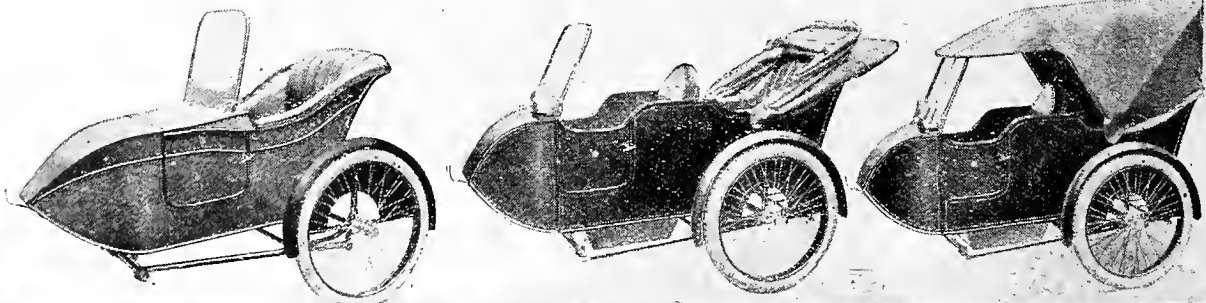
most satisfactory feature of Gloria models for some years. This consists of an arm, which is attached at one end to the chassis on ball bearings, while near the other end the wheel is attached. Above the wheel is a strong coil spring encased in a metal box, which takes the weight, while a small spring is also fitted to prevent any undue rebound. Four points of attachment are used, all of which are quickly detachable. The chassis is continued behind the axle to form a luggage grid, while the space between the rear attachment and the bicycle is occupied by a neat spare petrol can carrier. The body on this model is a luxurious coachbuilt one. Several other models are listed, all having a chassis of the same pattern.

Gloria Cycle Co., Much Park Street, Coventry.

### Bowser Sidecars.

Mr. E. Bowser, of Leeds, is offering attractive sidecars for 1916. Mr. Bowser was one of the earliest to produce a tandem-seated sidecar, and has made a speciality of this type. The more expensive models are fitted with a well-upholstered middle seat, which can instantly be removed by disengaging the brass latches that secure the back rest. When this is done the seat lifts out and can be neatly folded out of the way, so that, to all intents and purposes, the sidecar is then a single-seater, providing ample room for luggage, etc.

The middle seat of this model acts as a support for the sides of the body, equally distributing any undue strain caused by the weight of the front passenger when cornering, and since the body is of rather unusual length it will be realised that

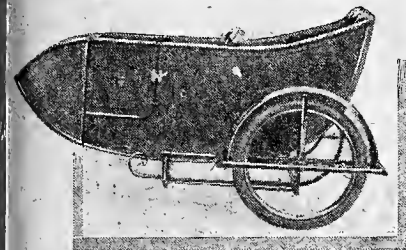


(Left) "Lounge" model Montgomery, and two views of a tandem-seated Montgomery de luxe.

**Sidecar Attachments.—**

This additional support is an important point.

The second model we were privileged to examine is similar in general outline, but the middle seat consists only of a

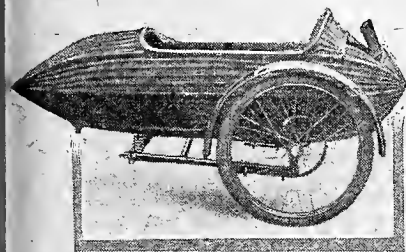


De luxe edition of the Bowser tandem-seated sidecar.

leather hammock, which can be adjusted by means of notches to any position to suit the convenience of the passengers. To remove the seat is the work of two seconds only, as it is simply lifted out, and can then be rolled up into very small compass.

The chassis of these models are under-lung, and are of very rigid construction. Four points of attachment are provided, and the body, which is excellently upholstered, is fitted with spacious tool box and pockets.

An attractive lightweight model with weed cane body was also brought before our notice. The body is designed on the streamline principle, and behind the



The Bowser light canework sidecar.

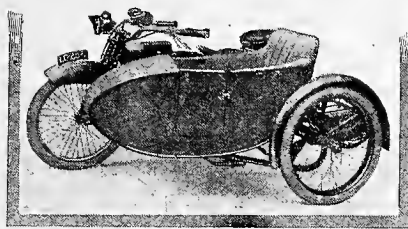
passenger's seat is a large locker, in which a petrol can and tools can be stored. The springing of this model is good, and the bodywork has a very well-finished appearance.

Other coach-built single-seat models are listed, but the special features for the new season are as described above.

E. Bowser, Sidecar Manufacturer, 50, Park Lane, Leeds.

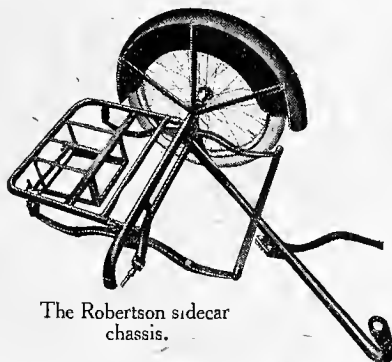
**Messrs. Robertson's Sidecar.**

The registered design of frame employed in Messrs. Robertson's new sidecar is a distinct departure from standard practice. It is attached to the motor bicycle frame at three points. The frame consists of an immensely strong tubular axle, below which is brazed an extension to the saddle tube, and from the further corner of this runs the long tube which is attached to the forepart of the motor bicycle frame; consequently, the sidecar frame forms a triangle with the motor bicycle as a base. The springing is also peculiar. The front portion of the springs serves to take the main weight of the body, a further single leaf spring



The Robertson sidecar

on the long tube of the frame taking the weight of the front of the body. The rear portion of the springs serves to suspend the luggage grid and spare petrol tin. The springing of the petrol tin is a most excellent point, as it saves the



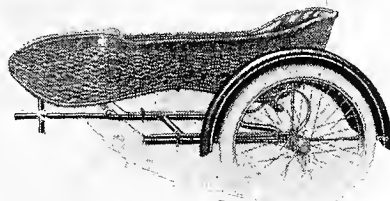
The Robertson sidecar chassis.

frame from any possibility of breakage through the carrying of heavy unsprung weight. Few sidecars allow the luggage to be carried on a sprung platform, and we consider the arrangement on Messrs. Robertson's production to be a most important improvement. There are no castings whatsoever in the frame, all parts being acetylene welded. The fixing of the mudguard is extremely substantial. The sidecar can be had with a 28in. wheel taking a 3in. tyre. Another peculiar point is that the front extension tube is attached low down on the frame. It is interesting to note that Messrs. Purcells, the well-known sidecar manufacturers, have amalgamated with Messrs. Robertson.

Messrs. Robertson's Motors, Ltd., 157b, Great Portland Street, W.

**Fitsu Sidecar.**

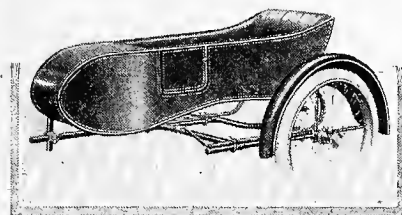
A somewhat unusual design of sidecar is the Fitsu. The body is made so that the passenger is sitting in a slightly reclining position, while the seat, which is heavily upholstered, is made to follow



The Fitsu wicker body.

exactly the contour of the body to a point below the knees. Both ordinary and underslung chassis are made. Coil springs are used, and the body is supported both front and back on shackles.

Three-point attachment is standard in all models, but an extra attachment lug can be supplied at a small extra charge. One very luxurious model is fitted with a



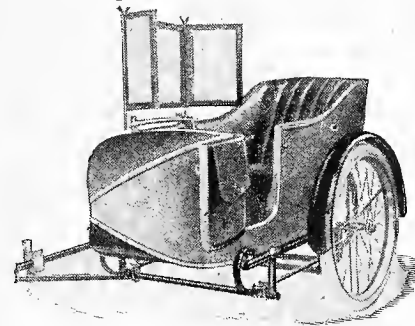
The Fitsu coach-built model.

detachable coupé top, which when fitted makes a weatherproof outfit from the passenger's point of view.

Fitsu Sidecars, Scalla House, 45, Smallbrook Street, Birmingham.

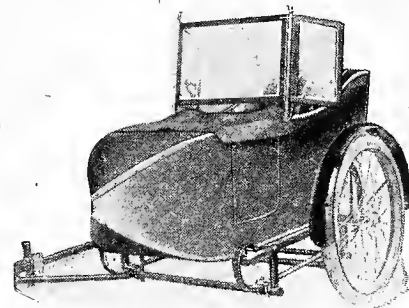
**Dunhill's Sidecar.**

The Dunhill sidecar has long been a very attractive proposition. The chassis is scientifically constructed, is of the drop variety, and is immensely strong. Wherever possible the triangular form of



The Dunhill screen out of use.

construction is employed, while considerable attention has been given to the bodywork. One of the most attractive features of the Dunhill sidecar is the screen which is shown in the accompanying illustration. It is designed to protect the passenger most effectively from the elements, since it is provided with side shields. It is also attached in such



The Dunhill screen in position.

a manner that it is adjustable in any position. Previous to the passenger getting out it may be swung to one side, as it is merely fastened to the body by means of a thumbscrew.

Messrs. Alfred Dunhill, Ltd., 359-361, Euston Road, N.W.

**Sidecar Attachments.—****An Ingenious Windscreen.**

A windscreen which will find favour among sidecar passengers is that manufactured by Messrs. Curry and Pitcher. It is fixed on to the door, and is opened and closed automatically with it. An apron is attached to the windscreen and fastened thereto, and also to the



front of the sidecar, by means of push buttons, consequently the whole of the front is rendered rain and draughtproof. The whole screen can be detached in a few seconds, and may also be adjusted to any position.

Messrs. Curry and Pitcher, 65-69, Henry Street, Ashted, Birmingham.

**Sidecar Bodies.**

Two patterns of serviceable sidecar bodies are being made for 1916 by Messrs. Bright and Hayles. One is a double-seated body; this is extra wide, and accommodates the passengers side by side. It is constructed of three-ply wood on an ash framework. It is well upholstered, and a roomy compartment



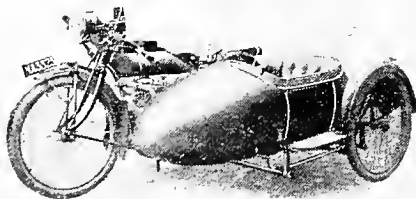
Bright and Hayles lightweight body.

for spares, etc., is provided under the seat. The other model is a lightweight, also constructed of three-ply wood, and when fully upholstered and provided with a roomy tool box under the seat weighs only 19½ lb.

Messrs. Bright and Hayles, 73, Church Street, Camberwell, London.

**Winson Sidecars for 1916.**

Messrs. J. Winn and Sons bring two attractive sidecars before our notice for



1916. All-metal bodies are the chief feature of these smart vehicles. The touring model is very warmly and comfortably upholstered, and roomy tool lockers are provided under front dome and seat.

The sporting model is thoroughly well upholstered, and there is ample seating

accommodation. A good-sized locker is provided in the bulbous back of the body, and this model is extremely smart and graceful in appearance.

Messrs. J. Winn and Sons, High Street Works, Rochdale.

**An Ingenious Sidecar Screen.**

The fault with many sidecar screens is that they are placed far away from the face of the passenger, who, instead of getting the requisite amount of protection, receives the benefit of an excessive amount of back draught. The Glendower screen is quite a clever device. The screen proper is attached to a framework which is pivoted at the



extreme rear of the sidecar body, and rests when in position on two brackets, one each side of the seat. The apron



is attached by turn-buttons to the lower portion of the screen. When out of use the apron is unbuttoned, and the screen swung right back.

The Glendower Motor Co., 3, Glendower Place, South Kensington, S.W.

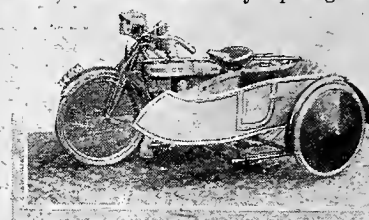
**The Swan Sidecar.**

Probably one of the handsomest sidecars on the market is the Swan. The chassis is of weldless steel tubing, except the axle, which is of special design built up of square section tube. This axle is curved in shape and formed in two separate parts one above the other, the lower one taking the wheel axle and connection to the machine, while the other is carried right round, forming two uprights upon which the body is suspended on coil springs which are under tension. A stand for the wheel is provided, and when not in use forms a stay for the rear of the mudguard. The body is very roomy, and the shape, with its rounded corners and high sides, is very pleasing. The locker under the seat and pocket in the upholstery provide ample space for storing parts, maps, and so on.

Messrs. Swan Sidecars, Oxford.

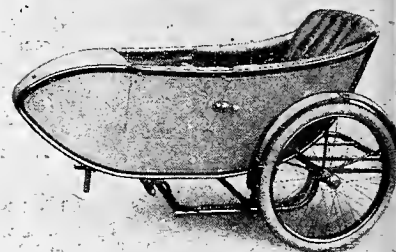
**Grosvenor Sidecar.**

The Grosvenor Motor Co. are this year producing a very attractive and strongly constructed sporting model sidecar. This model is produced with or without side door, and is efficiently sprung on the



lines of the heavy touring sidecar. It will be observed that a disc wheel is fitted, and this adds much to the sporting appearance.

The Grosvenor touring model, which is also illustrated, is designed on attractive lines. We understand, however, that the makers are making a special



effort to cope with the increasing demand for the lightweight.

Grosvenor Motor Co., Bradford Street, Bolton.

**Royal Leicester Sidecars.**

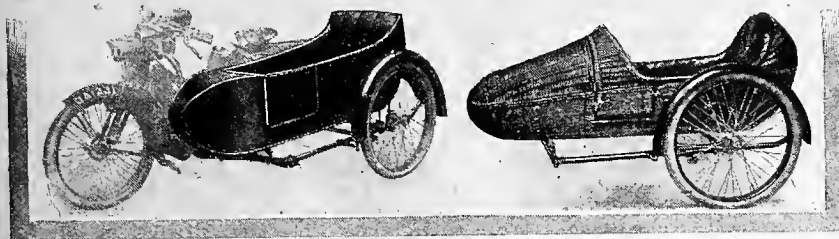
Among the many different model sidecars listed by Messrs. Stokes and Holt Ltd., perhaps one of the most interesting is the special double-seated model. The body is 72in. long x 18in. wide, and the two passengers are carried tandem fashion, a separate door being provided for the entrance of each. It is claimed that two adult passengers can be carried comfortably. The body is nicely finished, and is mounted on a chassis of the underslung pattern on Cee springs and long shackles. The springs run the



whole length of the chassis and coil a in front; to this part the front portion of the body is attached, also on shackle. Four-point attachment is used.

Messrs. Stokes and Holt, Ltd., Bridgegrave Road, Leicester.

## TYPICAL EXAMPLES OF SIDECAR ATTACHMENTS.



(Left) Touring Watsonian, and (Right) sporting canework Watsonian.

## Watsonian Sidecars.

The Watsonian tourist model N is a thoroughly comfortable touring sidecar, yet, at the same time, quite light, and intended for use on machines of low horse-power. The chassis is strongly built, and is dropped below the level of the wheel axle to give a low riding position. The springing can be had in either compound coil springs or C type at option. Three-point attachment is used, and the body is low built and of three-ply wood and well upholstered. Two other new models are models S and T. These have the same chassis and wicker bodies.

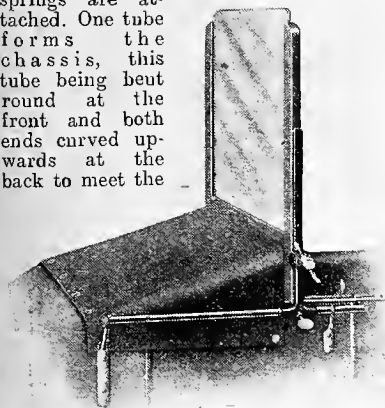
Model S has a very sporting appearance, being cone shaped in front and slightly bulbous at the back, while a kind of scuttle dash is provided which opens with the door. Model T has a wider body with high sides, and is intended as a light body suitable for serious touring. These three models by no means exhaust the Watsonian range.

Watsonian Sidecar Co., 131, Conybere Street, Birmingham.

## Supreme.

Although hampered by lack of material and skilled workmen the Supreme Sidecar Manufacturing Co., Ltd., are producing a new lightweight model which, it is hoped, will be ready shortly.

A new chassis also has been fitted to the model A car, having a crossbar below the body nose to which quarter-elliptic springs are attached. One tube forms the chassis, this tube being bent round at the front and both ends curved upwards at the back to meet the



Adjustable screen on Supreme sidecar

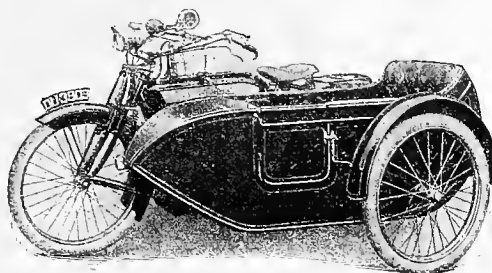
mudguard is supported by three tubular arms carried out from a bracket on the axle.

The body is unaltered, and has seats with horizontal padding to eliminate bunching of the stuffing, while the special windscreen is retained, this being supported on two horizontal bars, one on each side of the body. To clear the side door the screen is unlocked, then pushed forward, while the angle of the glass also is adjustable.

Supreme Sidecar Manufacturing Co., Ltd., 14, Gt. Hampton St., Birmingham.

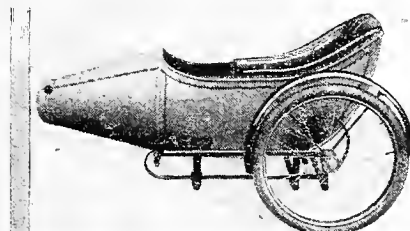
## The Bramble.

The Bramble Model No. 1 is a decided departure from usual practice. The chassis is entirely enclosed within the body. It is made of unbreakable angle steel, and to it are directly bolted all connections and springing arrange-



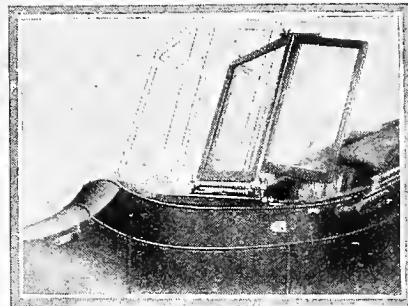
ments. The body is supported on double scissor springs, to which long shackles are fitted. The fact that the chassis is entirely enclosed not only has the advantage of placing the weight very low, but renders the whole outfit extremely easy to keep clean, besides giving a neat appearance. The body is very roomy and well upholstered, and ample space is provided for spares, etc. Special models are made to suit spring frame machines, in which case the axle is separately sprung.

Bramble Manufacturing Co., Ltd., London Road, Coventry.



## The Orto Windscreen.

A very practical windscreen is the Orto, which is provided with side flaps, and therefore serves as a most excellent protection against wind and rain for the passenger. It will be noticed that the screen slides along two rods, and consequently the distance from the rider's



face may be adjusted to a nicety. On the door being opened the screen is so arranged that it swings to one side.

Messrs. A. Atkinson and Co., 24, Arminger Road, Shepherd's Bush, W.

## Some New Sidecars.

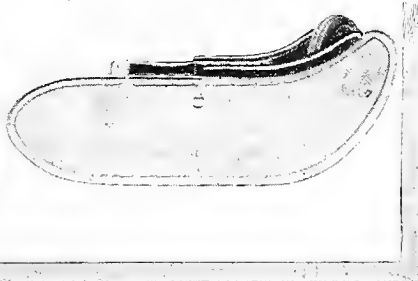
The G.K. Sidecar Co. are manufacturers of very practical sidecar bodies. The first of these to which we make reference is the de luxe type. The back is provided with a spring cushion, and is most luxurious. It is designed to swing forward, disclosing at the rear thereof a rack for the tools most commonly needed by the motor cyclist. When in this position it allows access to a large locker, in which clothes or spares may be stored.

Another interesting body is the double-seated G.K. The seats are situated tandem fashion, the seat for the front passenger being of the folding variety, and a strap stretched across the body acts as a back for the front passenger. When out of action the seat folds away, and assumes the form of a sloping footrest for the passenger.

The next to come under review is that known as the cigar pattern or sporting body. It is provided with a low but comfortable seat, and has a semi-cigar-shaped front. It is quite light, and offers little resistance to the wind.

One of the most attractive bodies we saw at the G.K. works was one made of cane covered with patent leather, and practically indistinguishable from a coach-built body.

Messrs. the G.K. Sidecar Co., Lorenzo Works, Lorenzo Street, Pentonville Road, N.



G.K. sidecars—sporting and de luxe models.

axle. Long C springs are then fitted from which to sling the body, while cross members stiffen the chassis.

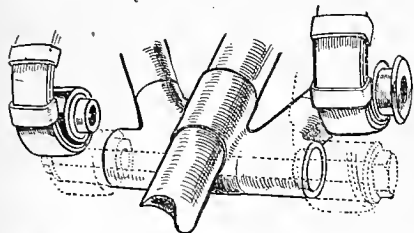
On the right-hand side is a footplate clipped to the chassis tube, and the wide



## Sidecar Attachments.—

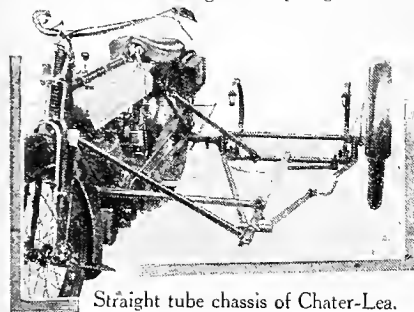
## The Chater-Lea Sidecar Chassis.

The new Chater-Lea sidecar frame is of quite novel design, and is a worthy production of this well-known firm. The frame forms a plain triangle, and, being dropped below the axle, gives a low position. Straight tubes are employed, and these are now stronger and lighter than formerly.



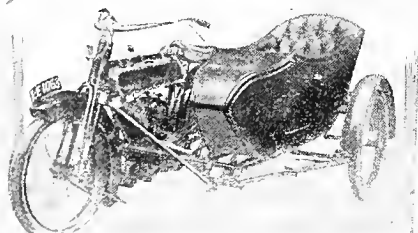
Method of attaching front springs to frame on the Chater-Lea sidecar.

The sidecar is attached to the motor cycle at four points, and the body is suspended from C springs with long shackles, while in front two small supplementary springs support the body. The method of attaching the springs to the



Straight tube chassis of Chater-Lea.

front of the frame is interesting. The apex of the triangle terminates in a short horizontal tube, the ends of the springs are wrapped round the bushes, and the front of the sidecar is secured by passing a long substantial bolt through



Chater-Lea sidecar outfit.

these bushes. A sidecar stand is provided. Altogether, the design is thoroughly practical, and impressed us most favourably.

Messrs. Chater-Lea, Ltd., 74-84, Banner Street, Golden Lane, E.C.

## Canoet.

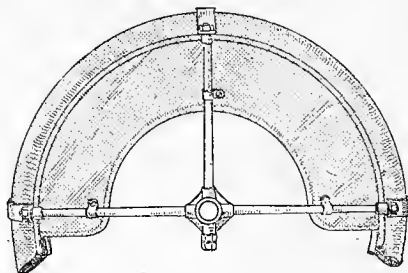
The Canoet sidecar is probably the pioneer of the boat-shaped, coachbuilt sidecar body and underslung chassis, and many of our readers will remember the sensation it caused when first shown at the 1911 Olympia Show. The essential features of this popular sidecar are unaltered for the coming year, but one or two slight alterations in detail are

all that have taken place. The telescopic tube running from the saddle pillar of the bicycle to the rear of the chassis has now been strengthened by the inclusion of an extra stay, as fully explained and illustrated in our issue of January 6th, and the attachment is now at five points. The handsomely finished body which has gained for this sidecar such popularity has not been altered.

Messrs. Mead and Deakin, Rushy Lane, Tyseley, Birmingham.

## Millford Modifications.

The Millford sidecar has always been familiar to motor cyclists interested in passenger carrying. These famous sidecars will remain practically unaltered



for 1916. The first model to describe is known as the Family model. The body of this model is specially designed to take a small chair in front for carrying a child. Plenty of space is allowed for the extra passenger, and ample leg room is provided for both. The Millford Empress is another model which is not only very handsome, but also extremely substantial. The chassis is underslung, and the side members are reinforced by a triangulated framework, upon which



the wheel axle is carried. The handsomely finished coach-built body is supported on large C springs both back and front. Four-point attachment is used. A large locker is provided for spares, etc., under the seat. A point which has been improved for 1916 on all models is the attachment of the mudguard and valance, which can now be replaced in the event of serious damage without the necessity of also replacing the stays and clip. Also the shackles (which we illustrate) have received attention, and are now designed to overcome any tendency to rattle.

Mills-Fulford, Ltd., Crown Works, Stoney Stanton Road, Coventry.

## The Spider.

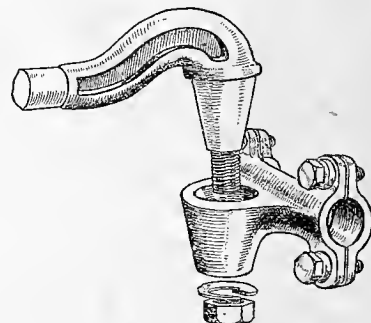
This is a sidecar specially built for use with lightweight machines. The body is of wicker, and the back is upholstered, and is made so that the passenger can lie down. It also has a special pointed wind front, which offers little resistance to the air, and protects the rider to some slight degree. The weight of the body is 15 lb. The chassis, although light, is very strong, and is of the drop pattern, giving a low position. It is fitted with quickly detachable fastenings. Its weight is 45 lb. It may be had with 24in. or 26in. wheels, fitted with 1½in. or 2in. Dunlop

or Clincher tyres. It is especially suitable for lightweights or for medium-weight motor cycles, and for racing purposes.

Messrs. James Grose, Ltd., 4, Old Jewry, E.C.

## Holt Sidecar Accessories.

Messrs. Holt and Co. list a number of useful fittings for use with sidecars, a very handy one being the quickly detachable coupling for both the front and rear connections. These consist of the telescopic arm terminating in a taper and screw which fit into a corresponding socket attached to the down tube and rear stays of the cycle, the taper being secured by a large nut, the removal of which is all that is necessary to detach the connection. A special bolt fitting is also made for the saddle pin connection. These clips are made in about forty patterns and sizes. Other useful fittings sold by this firm are a stand for the sidecar wheel and a lamp

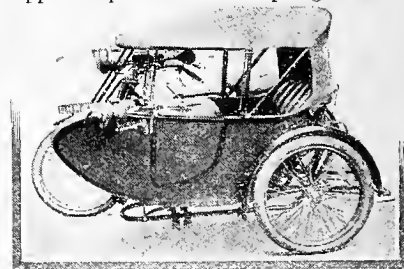


bracket for attaching to the off side of the sidecar chassis. In addition to these sidecar fittings another useful article consists of a trouser guard.

Holt Motor Accessory Mfg. Co., 13a, Kensington Road, Earlsdon, Coventry.

## The Hercules Sidecar.

The Hercules sidecar is a most elegant attachment. The chassis is formed by a complete loop of weldless steel tube, which is considerably dropped below the level of the axle and is also continued upward above the axle to form the supports upon which the springs for the



body are attached. The body, which is coachbuilt, is sprung both front and back, and is of a most pleasing design. Four-point attachment is used, and all the connections are quickly detached when necessary. A substantial luggage grid is fitted at the rear and folds up when not in use. A useful fitting is the rear stay of the mudguard, which forms a stand for the sidecar wheel.

The Hercules Cycle and Motor Co., Ltd., Conybere Street, Birmingham.

(Accessories continued on page 94.)

## MILITARY NOTES.

## MOTOR CYCLIST-AIRMEN. B.M.C.R.C. SERVICE MEETINGS PROPOSED.

## AN ACTIVE SERVICE PAPER.

WE have received a copy of the Bulletin of the No. 4 G.H.Q. Ammunition Park Sports Club. It is quite a lively little journal that sees the light every fortnight, being edited by Lt. D. H. Noble and Cpl. C. W. Cross. The former is the ex-Rover rider, and we have to thank him for the copy of the Bulletin. From the contents it is evident that there is plenty to do with one's spare time at G.H.Q., and football matches and cinema shows are going strong.

## POLICE AND THE M.M.G.S.

THE marked attention displayed by the police against military motorists in certain parts of the country is very lamentable. For instance, in the neighbourhood of the Motor Machine Gun Section training centre the police are very keen on hauling up, if possible, men of that section, and a few days ago we had the edifying sight of two men of the M.M.G.S. fined for not having properly illuminated identification plates on machines as supplied by the War Office!

## AIRMAN MOTOR CYCLIST MISSING.

SYDNEY C. HATHAWAY, who enlisted in the No. 5 (the Coventry) Battery of the Motor Machine Gun Service a year last November, and who three weeks ago came home for his kit, having been granted a commission in the R.F.C., is, we regret to say, unofficially reported killed. Sec.-Lt. Hathaway came home to Coventry at the beginning of the year, after nine months

of trench life with the M.M.G.S. He left again on the 7th inst., arriving at R.F.C. headquarters on the evening of the 8th. On the following Wednesday morning, the 12th inst., he acted as observer on an escort flight, and failed to return. At first it was presumed that observer and pilot had been taken prisoners, and a War Office notification to Mrs. Hathaway was to the effect that her son was "missing." A later note, however, stated that he was unofficially reported killed. Much sympathy is felt in Coventry for Mrs. Hathaway, as it will be recalled that it is only a few weeks ago that Mr. C. W. Hathaway, for many years works manager of the Triumph Cycle Co., died suddenly. There is a further irony in the fact that young Hathaway was to suffer misfortune so soon after he had been granted a commission in the R.F.C.

## A MOTOR CYCLIST IN THE NAVAL AIR SERVICE.

LAST week we had the pleasure of a call from Mr. Norman Lea, who is engaged in the Wireless Section of the R.N.A.S.

Since Lea's work consists in accompanying a pilot on a twelve-cylinder seaplane in reconnaissance work over the Belgian coast, he, as may be imagined, has some very entertaining experiences to record.

Lea is another of a large number of leading-motor cyclists who have enrolled themselves in one of the flying services; he sees no danger or particular excitement in his work! Of course, in this particular case special knowledge is needed, as all the time the observer is

busy "spotting" on the coast and sending messages by wireless back to the carrier-boat and also to other seaplanes in the vicinity. Twelve cylinders sounding somewhat of a maze, we asked Lea how many cylinders of his Sunbeam engine could be missing and the seaplane still continue to fly at speed, and were surprised to learn that, even should one cylinder cut out, nothing like the usual speed could be attained, and would quickly necessitate a stop for adjustment.

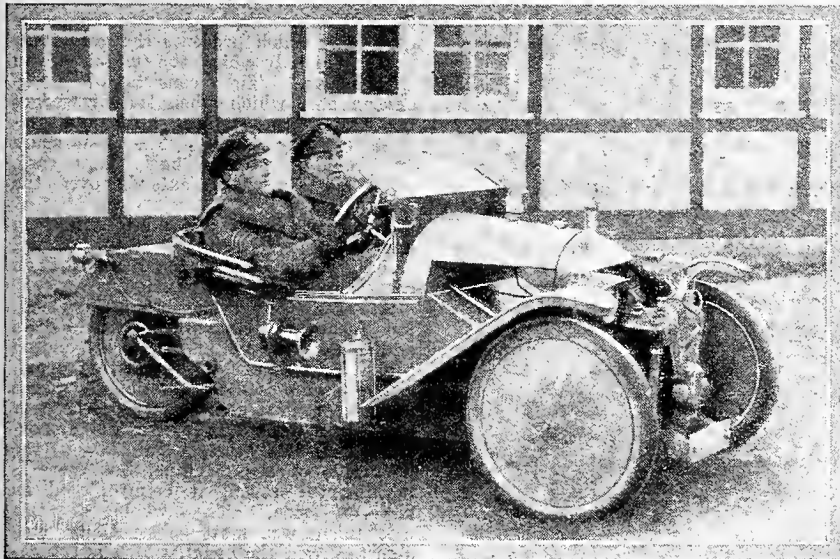
It may be mentioned that the sparking plugs are never left in the cylinders, but are regularly removed at the end of a run, and only put back into position again just before commencing a flight. This is to prevent moisture forming on the points.

One very exciting incident of Mr. Lea's career was an occasion when, returning from Zeebrugge and Ostend, they found themselves above a big bank of fog, which totally obscured everything. Continuing for some time in this manner, hoping for the mist to pass, a descent had at last to be made to find their bearings, but the plane was lower than the pilot imagined, and they reached the sea much more suddenly than desired, the sudden impact resulting in damaged floats and other parts, and there was nothing to do but drift about and wait for assistance. The sea was choppy, and both pilot and observer were wet through, and in this state they remained for several hours before they heard the bell of a collier. Yelling their hardest they were lucky in being heard as they drifted rapidly past the collier, and a boat was dropped and the men picked up. They managed to save their seaplane, and were subsequently picked up by a destroyer. Next day, after sundry repairs, they were able to fly back to the base.

## B.M.C.R.C. RACE MEETINGS IN 1916.

WE have lately been in conversation with the honorary secretary of the B.M.C.R.C. concerning the advisability of running a series of three race meetings at Brooklands during the coming season. He has gladly fallen in with our suggestion, and every endeavour will be made to run the Naval and Military motor cycle race meeting in April, the Allied Forces meeting in June or July, and the Navy and Army meeting in August or early in September—all open to any officer or man in uniform of the British or Allied armies and navies.

Readers will remember how successful were the last two meetings organised in 1915, and it is hoped to make similar events even more successful in 1916, when it is likely that the track will be in a far better condition. Officers and men at naval and military stations, where there are numerous motor cycles in use, are urged to give every assistance to obtain the requisite number of entrants. Any communications concerning the meetings should be addressed to, and any suggestions thereon will be heartily welcomed by, the honorary secretary, Mr. T. W. Loughborough, 83, Pall Mall, S.W.



## SUITABLE RECREATION WITH THE M.M.G.S.

Sgt.-Maj. E. Hackett (driving) and Gunner Macdonald, both of the M.M.G.S., who derive great pleasure from the latter's Grand Prix Morgan, which is kept at the training centre in the South of England. Macdonald came up by road on the Morgan from his home at Ely, Cambs, to enlist at Coventry.

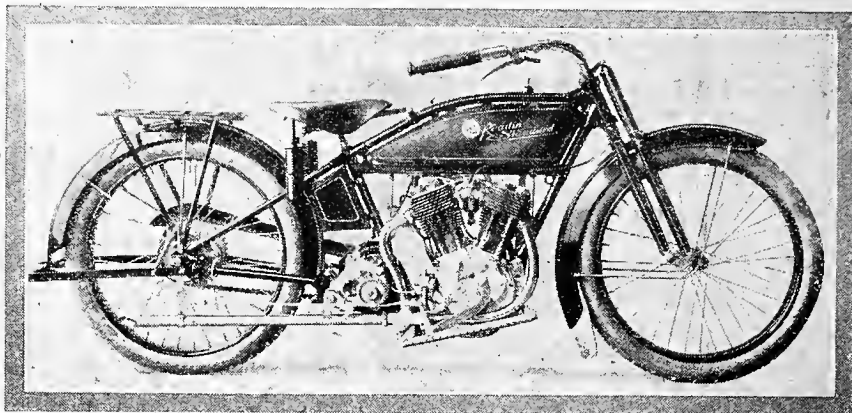
# The 8 h.p. Twin-cylinder Reading Standard.

85 mm. × 95 mm. (1,078 c.c.); Three-speed Gear Box.

ONE of the most practical American motor bicycles recently introduced into this country is the 8 h.p. Reading Standard. The general appearance is distinctly pleasing, and the machine presents several attractive features.

Contrary to the usual American practice, the engine is provided with side by side valves, and in general design closely resembles English productions. The tappets are adjustable, and the distribution gear comprises several points of interest. The timing gear wheels are of large dimensions, and cut integrally with them are the cams, which are of large size, there being one on either side of each of the two larger timing wheels, of which the outer actuates the inlet and the inner the exhaust. The tappets themselves are lifted by means of rockers interposed between them and the cams, while between the two exhaust rockers is a double cam, which is the internal exhaust lifter. On the lower of the two intermediate wheels which drive the magneto is a worm spindle driving a small plunger pump, which keeps a constant level of oil in the crank chamber. All the timing wheels are marked, so that in the event of the timing being deranged it is very little trouble for the owner to reset it correctly. At the base of the crank chamber there is a window, in which the level of the oil may be seen. The oil is delivered from the rear compartment in the tank to the pump, and thence to the lower part of the crank chamber, but there is also a hand pump on the other side of the machine, which conducts the oil to another part of the crank case. On the rear side of the machine there is a release valve, above the timing gear, at the end of which there is a long pipe for the purpose of conducting away any excess of oil which would otherwise be deposited on the crank case.

The carburetter is the well-known Schebler automatic, situated midway between the two cylinders, and attached to a short induction pipe. The design



Valve side of the 8 h.p. Reading Standard—the latest American importation.

of the exhaust is quite good; the pipes are free from bends, and both lead to a

long exit pipe; they do not, however, enter direct into this, but issue into the extension through a short perforated tube, consequently the gases are well split up, and the result is silence and the absence of back pressure.

## Transmission and Gear.

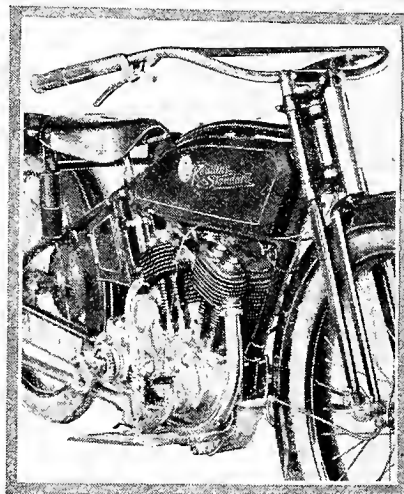
We now come to the transmission. This is by chain throughout, chains of particularly substantial size—namely,  $\frac{3}{8}$  in. wide and  $\frac{5}{16}$  in. pitch—being employed. The gear box is of the three-speed sliding type, and the gears themselves and their shafts are of large dimensions. The gear ratios are 3.9, 6, and 9.2 to 1. Ball bearings are provided, and the shafts are withdrawable. A multi-disc clutch is fitted, which is actuated either by hand or foot, and there is an interlocking device inside the gear box, which prevents the gear lever being shifted while the clutch is in engagement. This consists of a D-shaped bar, which when turned wedges up against the striking lever and prevents it being moved. The front chain is provided with a half chain case, while a chain guard extends over the rear chain.

The footboards, which are 16 in. long and 4 in. wide, can be made to fold up, and give the rider ample room for an occasional change of position.

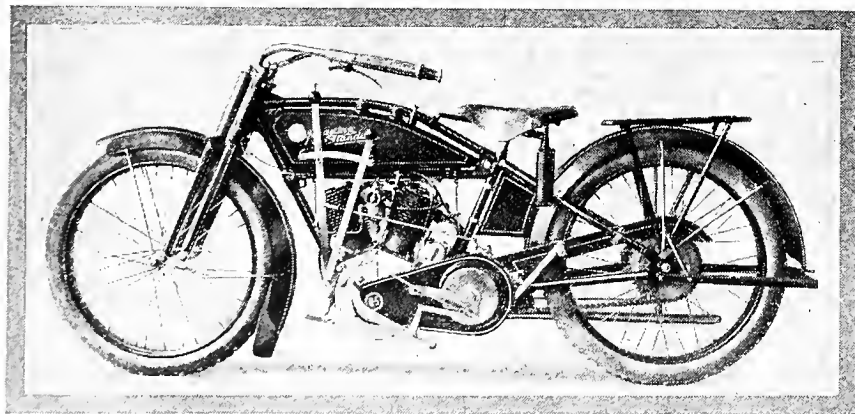
At present only one brake is fitted, but future models will be provided in addition with an internally expanding brake working inside the existing drum.

The engine is set in motion by means of a substantial kick starter of the gear and sector type. In the model demonstrated to us, the pedal is on the near side of the machine, but there is nothing to prevent it being placed on the off side. The whole of this mechanism was most substantially constructed, and the pedal, which is rubber-covered, can be swung out of the way when not in use.

The frame is an excellent piece of work, of a symmetrical design, which allows the top tube to curve downwards at the rear, and continue in a straight line to the rear forks, which is certainly



Showing neat design of front forks and handle-bars.

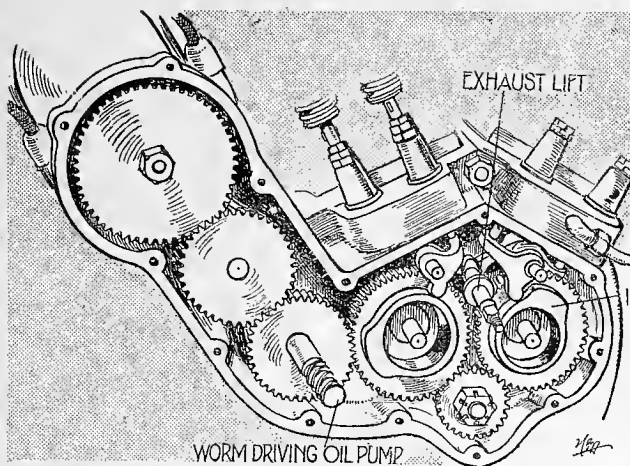


Left-hand side of the Reading Standard showing transmission, which is all chain with a countershaft three-speed gear box.

**8 h.p. Twin-cylinder Reading Standard.—**

an attractive feature. It is constructed of heavy tubing reinforced throughout, and drop forgings are employed where the frame is subjected to severe stresses, while sidecar connections are built into the frame. The saddle position is only 30in. from the ground, which is a feature that should be much appreciated. This saddle is provided with enclosed springs, and a spring seat pillar is also fitted. The spring forks are of neat design, and should be effective, the bearing surfaces being large and the springs being totally enclosed.

Every part of the Reading Standard, except the carburetter, clutch, and magneto, is made throughout at the company's workshops at Reading, Pennsylvania, U.S.A. Points of convenience have been well studied. The luggage carrier is substantial, and so is the stand, while between the saddle tube and rear mudguard is a capacious metal tool box. The mudguarding of the machine has been well thought out, the mudguards being wide and substantial. Altogether



Timing gear of the twin-cylinder Reading Standard.

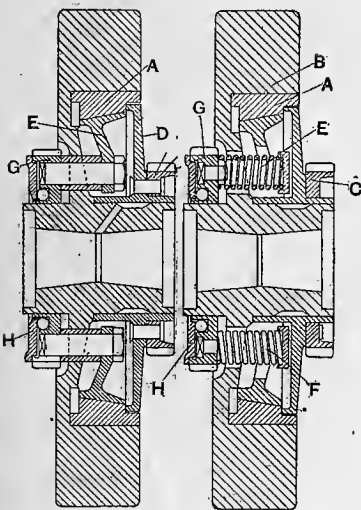
the Reading Standard is one of the few recently imported American machines, which really conforms to British ideas. It is, of course, an ideal sidecar mount, and we are looking forward to a comprehensive trial of it on the road at no distant date.

The control is by twist grip and Bowden wire, but contrary to the usual American practice the exhaust lifter is independent and works direct. The machine is handled in London by the Reading Standard Co., 28, Baker Street, W.

## SCOTT PATENT CLUTCH AND GEARBOX.

**A Compact Friction Clutch.**

This clutch has been designed to obtain a construction which is extremely narrow and compact. The clutching action is that of expanding a split ring



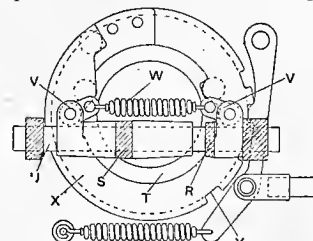
A against the interior surface B of the flywheel. Two sectional views are shown, these being taken on different lines to show the complete internal construction. The flywheel is attached to the engine crankshaft as usual, and revolves continuously therewith. Rotating on the hub of the flywheel is a gear wheel C from which the power is taken off to the road wheels. This gear wheel is bolted up to a disc D with which is connected the expanding clutch ring A. The parts A and D rotate always together, and they constitute the driven member of the clutch. Expansion of the split ring A is effected by means of a sliding cone E, which engages a similarly conical surface on the interior of the split ring A. The cone E is pressed to the left by the springs F, which bear, at their left-hand ends, against a gear

wheel G attached by bolts to the sliding cone E. The bolts pass through holes in the web of the flywheel, so that the flywheel and sliding cone E always revolve together, and when the clutch is released the split ring A is expanded and gripped between the cone E and the rim of the flywheel. One face of the gear wheel G is provided with a thrust plate H, and against this operates the clutch pedal or the like, which presses the cone E to the right. The gear wheel G drives the magneto, and is made slightly wider than the gear which meshes with it, causing it to remain in engagement in spite of its sliding action. —A. A. Scott, No. 1,291, 1915.

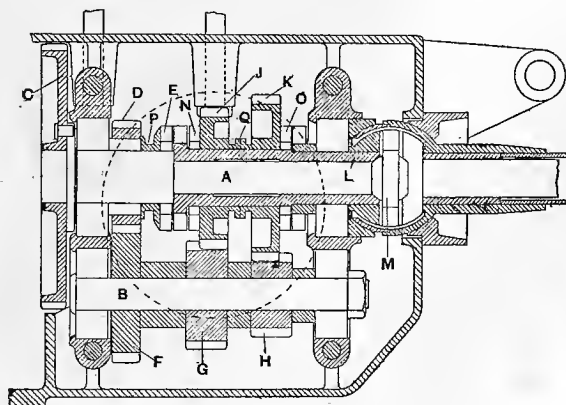
**A Three-speed Gear Box.**

The larger view is a sectional elevation of the gear box, the driving-shaft A being arranged directly over the layshaft B. The drive passes to the former from a spur gear wheel C. Free to slide but not rotate upon the driving-shaft is a spur pinion D provided with clutch dogs E, and gearing with a spur pinion F on the layshaft. The layshaft also has fixed upon it further pinions G H engaging corresponding pinions J K free to slide upon a sleeve

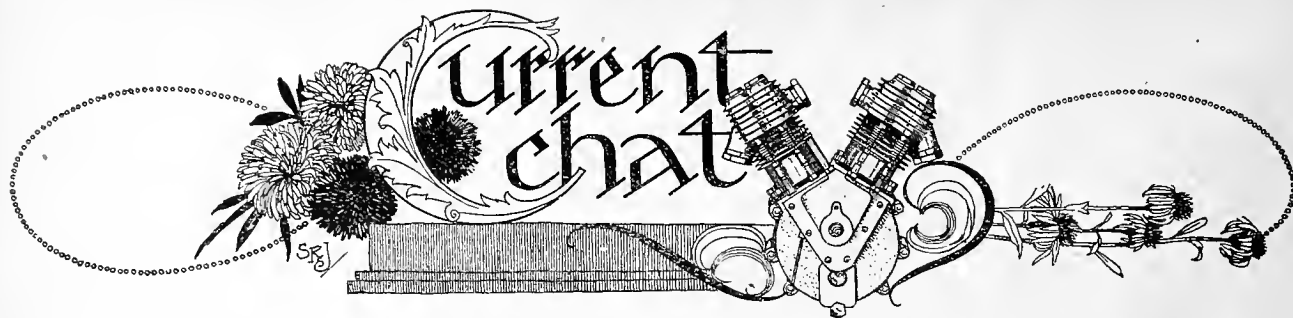
L, which takes a bearing on the driving-shaft, and at its right-hand end is coupled up to a universal joint M, by which the drive is taken from the gear box. The pinions J K are provided with clutch dogs N O adjacent to similar dogs on the ends of the sleeve L. The pinion D is formed with a groove



P, and the pinions J K with projections Q, the groove P and projections Q being engaged by gear shifting rods R S seen in the smaller view. Sliding of the rods R S in order to engage the respective dog clutches and obtain the required changes of gear is effected by a cam T. The bosses of the rods R S are mounted on a shaft U, and each boss carries a roller V engaging the periphery of the cam T. The bosses are connected by a spring W tending to draw them inwards. Thus, when the cam T is rotated by its control lever (not shown) into a position in which the recesses come under the rollers, the latter are drawn inwards by the spring W, and the gear shifting rods R S moved as required. In order to prevent damage to the gears and clutch dogs, the cam T is attached to a plate X provided with recesses Y engaged by a locking plate. This plate may also be connected up to the clutch actuating rod.—A. A. Scott, No. 1,293, 1915.







## TIMES TO LIGHT LAMPS.

GREENWICH TIME.

Jan. 27th	...	...	5.6 p.m.
„ 29th	...	...	5.9 „
„ 31st	...	...	5.12 „
Feb. 2nd	...	...	5.17 „

## Bristol Motor Cycle Club.

Of the members of the Bristol Motor Cycle Club thirty-two are now in His Majesty's Forces. At a recent meeting it was decided that a committee of three should select a suitable place for the new headquarters, as the Queen's Hotel, the present headquarters, is to be closed on February 1st. Mr. A. Stevens was elected honorary secretary *pro tem.*, owing to the sudden resignation, due to the pressure of business, of the honorary secretary, Mr. F. P. Wasley. With regard to competitions for 1916, it was decided that the matter should be left over until the next meeting, but it was hinted that an open trial at Easter for military motor cyclists or those wearing armlets would be an interesting and desirable fixture. The secretary would be obliged if the following gentlemen would communicate their addresses to him, so that awards due to them in the open trials held in January and April, 1915, may be forwarded: G. E. Radley, C. Holland, C. Norrington, G. O. Scrampton, H. Walker, C. Percival, A. J. Dowler, and E. R. Troward (Lt.).

## SPECIAL FEATURES.

SIDECARS AND ACCESSORIES  
(Over 130 Illustrations).BREAK HILL-CLIMBING IN THE PEAK  
DISTRICT (Illustrated).

## Lamp Discs Free.

The Automobile Association and Motor Union are issuing free of charge to any motorist member or non-member perforated discs for dimming lamps to comply with the new lighting regulations. In applying for discs to Fannum House, Whitcomb Street, Coventry Street, W., diameter of the lamps must be given.

## Is a Tax Necessary?

A fine point has arisen in connection with the tax on the P. and M. motor bicycle and sidecar used by the performing seals and juggling sea lions in Capt. Woodward's stage performance. Considering that the gear ratio is  $2\frac{1}{2}$  to 1, there is little chance of it being used on the road, but as it has to be moved from one variety theatre to another this fact alone seems to necessitate the taking out of a licence.

## The M.C.C. Annual General Meeting.

The annual general meeting of the Motor Cycling Club will be held at the Café Monico, Piccadilly Circus, W., at 6.30 to-night, to receive the annual report and statement of accounts. The report has little to record, and the accounts show a considerable fall in revenue, which is only natural, seeing that yearly subscriptions have been reduced from 21s. to 5s., and Service members have been exempted altogether. To preserve the financial position of the club, the executive have purchased £400 of War Loan stock.

## Never Seen in the Air.

A good story was told by Mr. Arthur Butterfield in a lecture at the Birmingham Rotary Club on the 17th inst. on "The Simplicity of a Two-stroke Motor Cycle." Speaking of a trial of a Levis engine for aeroplane work, he said: "We got cleared off our pitch at the Castle Bromwich Aerodrome, after getting the first machine ready to test for flight, when the war broke out. Then, to complete our disgust, before moving the machine away, one of the onlookers asked me why we had painted the rudder plane such a funny colour. I explained that that was an invisible blue, a sky-blue tint which rendered the machine more difficult to discern when in the air. He remarked, 'Ah, I might have known that that thing will never be seen in the air.'"

## A Stolen Machine.

A second-hand Sun lightweight has been stolen from a Chester garage, and a reward is offered for information leading to its recovery by Messrs. Marstons, 26 and 31, Bridge Street, Chester. It is a single-gear 1914 model, black frame, black and gold-lined tank. The aluminium cover for the magneto chain was missing, and the registration number was OM 684.

## A Motor Cyclist Corps in Africa.

A daily press telegram states that a Motor Cyclist Corps is being formed in South Africa for service in East Africa. We await further details, but we have no doubt that the decision will greatly please South African riders, a great number of whom have made the journey home to England at their own expense specially to enlist in the different motor cyclist sections of the British Army.



CLIMBING THE WINNATS PASS, DERBYSHIRE.

Further photographs and particulars of a hill-climbing expedition on the severe ascent will be found on page 89 of this issue.

**The Sutton Coldfield Automobile Club.**

Of the many members of the Sutton Coldfield Club serving in His Majesty's Forces we regret to note that three have been killed in action since the commencement of war. They are K. H. Clarke, G. Patterson, junr., and H. G. Turner.

**The National War Funds.**

At the week-end the principal war funds stood as follow:

The Prince of Wales's National Relief Fund (£2,893,000 distributed) .. .. .	£5,719,462	0	0
The Times Fund for the Sick and Wounded .. .. .	3,156,333	0	0
The Weekly Dispatch Tobacco Fund .. .. .	97,549	16	9
The Queen's Work for Women Fund .. .. .	168,280	19	7
The Belgian Relief Fund .. .. .	1,325,000	0	0

**Promotions.**

ARMY SERVICE CORPS.—Temporary Sec.-Lt. E. A. Burney to be Temporary Lt. E. A. Burney is well known to our readers as a competition rider, and was formerly one of the directors of Messrs. Burney and Blackburn.

Sec.-Lt. (Temporary Lt.) to be Temporary Capt. M. G. W. Burton. Capt. Burton was formerly secretary of the Cambridge University M.C.C., and was one of the organisers of the most successful Inter-Varsity Race Meeting held at Brooklands about eighteen months ago.

**Lincolnshire A.C.**

Satisfactory support for the scheme for mobilising local motorists under the title of the Lincolnshire Volunteer Motor Ambulance Transport Service was reported at the annual meeting of the Lincolnshire Automobile Club held at Lincoln on Friday under the presidency of Sir Hickman B. Bacon, Bart. The scheme, it was stated, had received one donation of £20, and under the organisation of Mr. A. E. Brunning 372 cars and 314 motor cycles were now on the register. The car owners were split up into thirty-two sections, distributed throughout the county, each with motor cycle despatch riders. When completed the scheme would permit of a quick concentration of ambulances at any given point under the control of the Red Cross Society. Many members were doing military duty, and the committee have decided to remit the current subscriptions for members serving abroad. Despite inevitable losses through the war, the membership was 314.

**D.R. Recruits and Group System.**

The recruiting position, so far as it affects R.E. despatch riders, is made clear in this issue.

**Mr. R. H. Lea.**

Accompanying Norman Lea (an interview with whom appears elsewhere in this issue), when he called on us at the end of last week, was his father, Mr. R. H. Lea, sen., director of Lea-Francis, Ltd., who met with a bad accident as a result of a collision last summer. We were glad to note that he is making good progress towards complete recovery.

**Maux Boats on War Service.**

Numerous readers of *The Motor Cycle* who have crossed to the Isle of Man will be interested to hear that the turbine steamer formerly known as the *Viking* is now doing yeoman service under another name in H.M. Navy, while another Maux boat is engaged in mine-sweeping.

**An Ingenious Variable Gear.**

Students of design must have been much interested in the variable gear described in our last issue, the invention of Mr. C. H. Ingall, the designer of the Lea-Francis motor cycle. This gear gives an infinite number of variations between the solid top gear and zero; it also provides a reverse. Though possibly, more suited to a light car, in the form shown in our illustration, with certain modifications, it should prove an ideal gear for a motor cycle.

**Help for Disabled Riders.**

As showing the representative character of the meeting held at the R.A.C. last week to consider the formation of a central body to look after the interests of disabled motorists, the following list should be noted:

Royal Automobile Club.  
A.A. and M.U.  
Auto Cycle Union.  
Commercial Motor Users' Association.  
Society of Motor Manufacturers and Traders.  
Motor Trade Association.  
Cycle and Motor Trades Benevolent Fund.  
National Traction Engine Association.  
Associated British Motor Manufacturers.  
National Society of Chauffeurs.  
Imperial Motor Transport Council.

A central committee has been formed which will devote itself to providing employment for those disabled men who, prior to enlistment or during the war, were engaged in any capacity connected with motoring. The subject is referred to in a leading article in this issue.

**Engineer and Athlete.**

The managing director of the British Harley-Davidson Co. is now Mr. Duncan Watson, I.E.E., who is the sole proprietor of Messrs. Duncan Watson and Co., electrical engineers, Messrs. Berry, Harrison, and Co., and Messrs. Roger Dawson, and chairman of directors of Opel Motors, Ltd.

Another addition to the board is Mr. John Withers, of Messrs. Withers, Birkett, and Davies. At Cambridge he was captain of his college boat, and for some time hon. secretary of the Alpine Club.

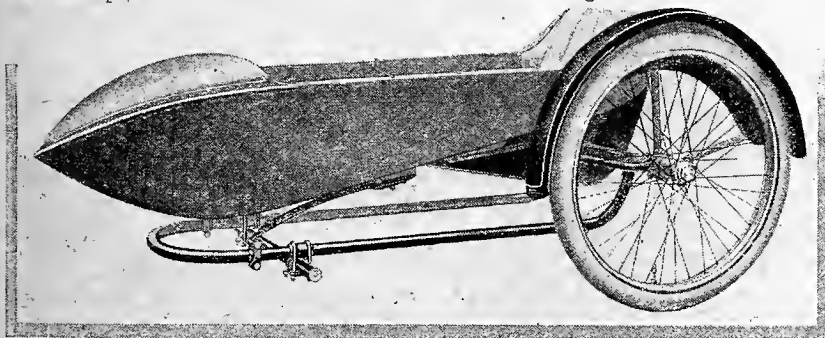
**Average Prices.**

We give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted. If there were not at least two advertisements, then the last occasion on which they were quoted is given.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S. ....	1915	6	3-sp. sidecar ..	£82
" .....	1914	6	3-sp. sidecar ..	£71
" .....	1913	6	3-sp. sidecar ..	£57
" .....	1915	2½	2-speed .....	£51
Alton .....	1915	2½	2-speed .....	£36
Ariel .....	1914	3½	3-sp. sidecar ..	£33
Bradbury ..	1914	4	3-sp. sidecar ..	£47
B.S.A. ....	1915	4½	3-sp. sidecar ..	£68
" .....	1914	4½	3-sp. sidecar ..	£57
" .....	1913	3½	2-sp. sidecar ..	£40
" .....	1913	3½	2-speed .....	£31
Calthorpe ..	1914	2	2-speed .....	£17
" .....	1915	2½	2-speed .....	£30
Clyno .....	1914	6	3-sp. sidecar ..	£66
" .....	1913	6	3-sp. sidecar ..	£50
Douglas ...	1915	2½	2-speed .....	£44
" .....	1914	2½	2-sp. kick start ..	£38
" .....	1914	2½	2-sp. T.T. ....	£38
" .....	1913	2½	2-sp. T.T. ....	£31
" .....	1913	2½	2-speed .....	£34
Enfield ....	1915	6	2-sp. sidecar ..	£70
" .....	1914	6	2-sp. sidecar ..	£60
" .....	1913	6	2-sp. sidecar ..	£47
" .....	1915	3	2-speed .....	£43
" .....	1914	3	2-speed .....	£37
A. Excelsior	1914	7	2-sp. sidecar ..	£55
H.-Davidson	1915	7	3-sp. sidecar ..	£75
Indian .....	1915	7	3-sp. sidecar ..	£78
" .....	1914	7	2-sp. sidecar ..	£55
" .....	1915	7	3-speed .....	£63
" .....	1915	5	3-speed .....	£58
" .....	1914	7	T.T. free engine ..	£44
James .....	1915	4½	3-sp. sidecar ..	£75
Lea-Francis.	1915	3½	3-speed .....	£63
Levis .....	1915	2½	Popular .....	£25
Matchless ..	1915	8	3-sp. sidecar ..	£80
" .....	1914	8	2-sp. sidecar ..	£70
" .....	1913	8	2-sp. sidecar ..	£53
New Hudson	1915	6	3-sp. sidecar ..	£61
" .....	1915	2½	2-speed .....	£30
N. Imperial	1915	2½	2-speed .....	£30
" .....	1914	2½	2-speed .....	£26
O.K. ....	1915	2	2-speed .....	£24
" .....	1914	2	2-speed .....	£21
P. & M. ....	1913	3½	2-sp. sidecar ..	£43
Premier ....	1914	3½	3-sp. sidecar ..	£45
" .....	1913	3½	3-sp. sidecar ..	£40
Rex .....	1914	6	2-sp. sidecar ..	£48
Rover .....	1915	3½	3-sp. sidecar ..	£61
" .....	1914	3½	3-sp. sidecar ..	£43
" .....	1913	3½	3 sp. sidecar ..	£40
Rudge .....	1914	5-6	multi sidecar ..	£41
" .....	1915	3½	multi .....	£47
" .....	1914	3½	multi .....	£37
" .....	1913	3½	multi .....	£29
" .....	1914	3½	multi sidecar ..	£47
Scott .....	1914	3½	2-sp. sidecar ..	£48
" .....	1913	3½	2-sp. sidecar ..	£48
Sunbeam ....	1915	6	3-sp. sidecar ..	£96
" .....	1914	6	3-sp. sidecar ..	£80
" .....	1915	3½	3-speed .....	£63
" .....	1914	3½	3-speed .....	£52
Triumph ....	1914	4	3-sp. sidecar ..	£53
" .....	1914	4	3-sp. sidecar ..	£43
" .....	1913	3½	3-sp. sidecar ..	£47
" .....	1913	3½	2-speed .....	£39
Williamson .	1914	8	2-sp. sidecar ..	£62
" .....	1913	8	2-sp. sidecar ..	£55
Zenith .....	1914	8	Gradua sidecar ..	£67
" .....	1914	6	Gradua sidecar ..	£56

**A SPORTING DESIGN LIGHTWEIGHT SIDECAR.**

Canoet Minor coachbuilt lightweight sidecar, the body of which weighs, upholstered, only 25 lb. It is so light that a man can support it on the palm of the hand. Canoet sidecars are referred to on page 80 of this issue.

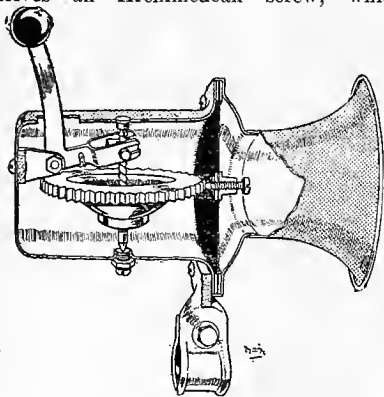


## MECHANICAL HORNS.

The divergency in the design of the growingly popular mechanical warning device is not generally appreciated. The drawings and descriptions accompanying will interest those who take a delight in knowing "how the wheels go round."

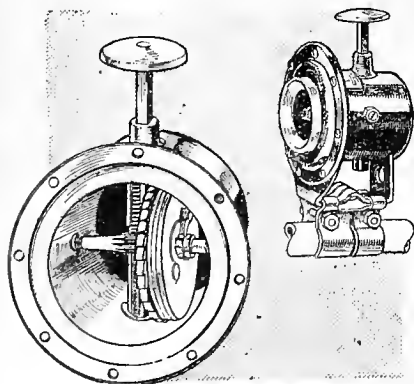
**T**HE amount of ingenuity displayed by designers in producing a warning note by means of a mechanical horn is quite astounding. *The Motor Cycle* was the first journal to go to the trouble of taking each one of these horns to pieces and having the interior sketched for the benefit of the motor cyclist. The average motor cyclist is nothing if not practical, and he dearly likes to know how any piece of mechanism on his machine works. When the various designs are compared a very clear idea may be gathered of the different methods employed in producing the sound. In almost every case the sound is produced by causing the teeth of a cog wheel to rotate against an adjustable point in the centre of a diaphragm placed immediately behind the bell mouth of the horn, but variety is to be found in the different methods used to drive the actuating cog wheel.

Let us take, for instance, the **SPARTON HORN**. In this case the lever outside drives an Archimedean screw, which

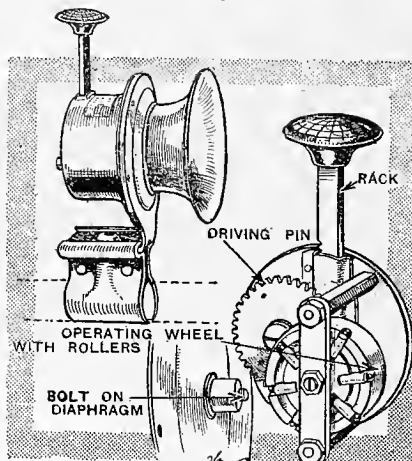


causes the cog wheel to revolve at a rapid rate. The mechanism of this horn is extremely simple. (Messrs. Brown Brothers, Ltd., 15, Newman Street, Oxford Street, W.)

**THE GLORIAPHONE.**—The mechanism of the Gloriaphone is easily followed. The lower part of the plunger rod is cut so as to form a ratchet, and works in a slide



in which there is a spring to return it to its original position after it has been depressed. This ratchet engages with threads cut on a spindle turning at right

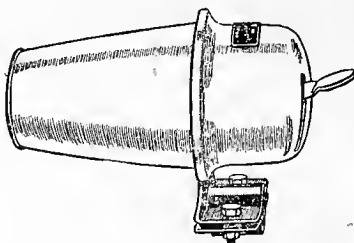


The Long horn referred to below.

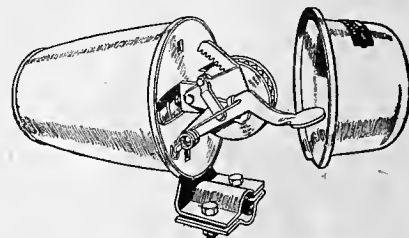
angles to it, on which there is loosely mounted on a ratchet a large tooth wheel which engages with the contact point on the diaphragm of the horn. The object of the ratchet, of course, is to allow the plunger to return to its original position after the horn has been operated. One of the peculiarities of the Gloriaphone is the absence of a bell mouth, yet despite this it makes plenty of noise. (Messrs. Etienne et Cie., 42, Gray's Inn Rd., W.C.)

We now come to the **LONG HORN**. This is actuated by means of a push-down lever, on the interior portion of which is a rack which drives a spur wheel attached to a larger wheel fitted with a ratchet. The noise is produced by means of a flywheel, on the face of which are regularly placed rollers which hit against the contact point situated in the centre of the diaphragm. This is quite a different principle from that employed in other horns. (Messrs. Markt and Co., Ltd., 98-100, Clerkenwell Road, E.C.)

The **SIMMS MECHORN** is of peculiar design, both internally and externally.

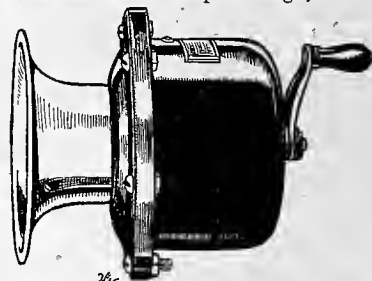


In this case there is a press-down lever on the outside to which is attached a rack which engages with a pinion on the cog wheel, which comes into contact with the diaphragm. (Messrs. Simms Motor Units, Ltd., 191, Wardour St., W.)

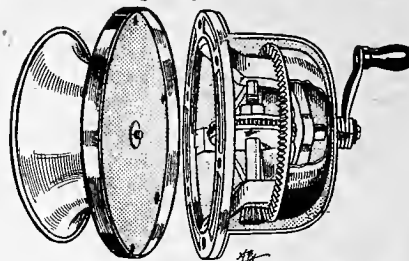


Interior of the Simms Mechorn.

**TAYLOR'S MECHANICAL HORN.**—In this the driving mechanism consists of a handle outside. Here, again, the interior mechanism is of simple design, a large

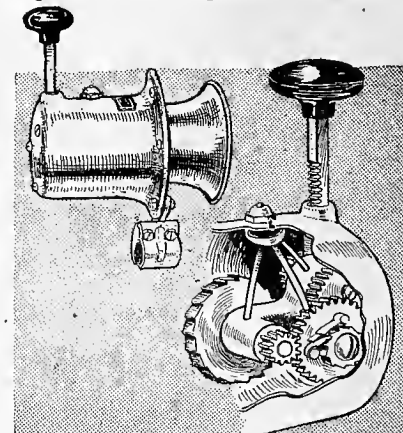


bevel coupled direct to the handle meshing with a small crown wheel, to which the actuating cog wheel is attached



(Messrs. H. Taylor and Co., Ltd., 21a, Store Street, W.C.)

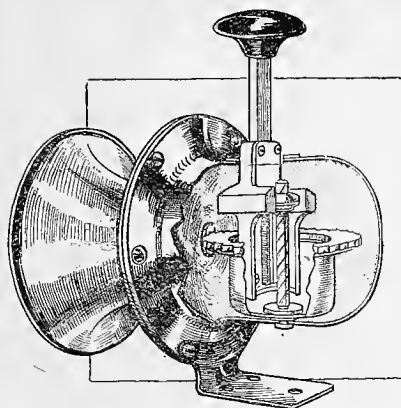
Next comes a pattern which is slightly more complicated. This is known as the **HAND KLAXON**. Like the Long Horn it is provided with a push-down handle, in



**Mechanical Horns.—**

the lower portion of which there is a rack which engages with a train of highly geared wheels, which cause the teeth of the sound cog wheel to hit against the contact point of the diaphragm. Both this and the Long Horn belong to the same type, as the rapid depression of the plunger causes the wheels to rotate for some little time, with the result that a prolonged note is produced in this manner. Yet another interesting feature is the lubrication system, as a squirt of oil given through the lubricator finds its way into a cup, whence it reaches, by means of pipes, the three principal bearings. (Messrs. The Klaxon Co., 1, King Street, St. James's, S.W.)

**THE DUNHILL.**—Curiously enough, the Dunhill mechanical horn works on very much the same principle as the Spartan, in which an Archimedean screw is em-

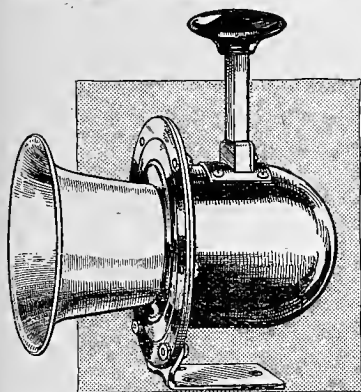


ployed on the diaphragm. A spring is employed to return the handle to its original position after being depressed. (Messrs. Alfred Dunhill, Ltd., 359-361, Euston Road, N.W.)

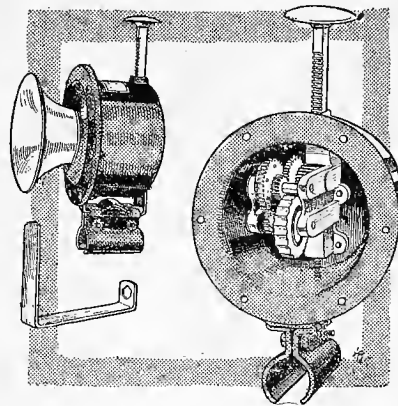
The STEWART HORN is an excellent one of very much the same type as the Klaxon, and in this also a train of wheels is set in motion by pressing down a rack, while the sound is produced in very much the same manner as in the Klaxon. In all the horns under review the note can be to some extent varied by adjustment of the contact point on the centre of the diaphragm, and to facilitate this the manufacturers of the Stewart supply a special tool which greatly aids this operation. In the case of some horns the whole bell mouth portion has to be removed before adjustment can be effected. (Messrs. The Cooper Stewart Engineering Co., Ltd., 11, Broad Street, Bloomsbury, W.C.)

A study of these horns is by no means uninteresting. The leader, of course, was the electric Klaxon, which produces much the same effect by means of an electric

motor. The original Klaxon, however, has been unrivalled as a road clearer, but such a system would be unwieldy on the average motor bicycle, consequently the mechanical horn has proved to be a very good substitute. No one can say that the noise it produces is calculated to promote good feeling between the motor cyclist and the pedestrian, though the latter may often be glad of its existence. He is a curious person, is the pedestrian. He hops out of the way and glares at you angrily after trying to throw himself under your front wheel, and yet, had it not been for the raucous note of the mechanical horn, he would probably have been rolled into the gutter. The note the mechanical horn produces is raucous and penetrating, and it owes its popularity solely to the fact that it can be heard a long way off, and above other street sounds in dense traffic. Many are now being used by both Navy and Army throughout the country, and their penetrating sounds may be heard calling road users to make way in "the King's name."



ployed. On the handle being depressed, a threaded arm passes down the Archimedean screw, causing the drum on which the teeth are cut to revolve rapidly, these in turn come in contact with a



The Stewart mechanical horn.

## Royal Engineers (Signal Section).

### Central Office Announcement concerning Recruiting of Despatch Riders.

TO obviate the difficulties and unfairness which were inevitable under the old system of recruiting motor cyclists for the Royal Engineers, and in order to ensure that all qualified men should have a fair opportunity of enlisting in the Motor Cyclist Section R.E. throughout the United Kingdom, instructions have been issued by the newly constituted Central Offices, of which the following is an extract:

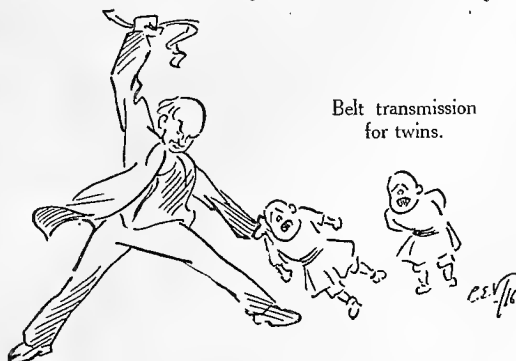
"Every man examined and found to be qualified for registration on a waiting list should be attested and passed into the Reserve (Group System). Such men should be supplied by the secretary of the local Motor Cyclist Reserve Committee with a certificate stating that they have been approved as suitable candidates for the Motor Cyclist Section R.E., which certificate should be handed to the Recruiting Officer by the candidate at the time of attestation. The Central Office must be informed of the number of the group in which each man on a waiting list has been attested, and in allotting vacancies will include as far as possible all men of those groups then under notice

of joining. If any man receives a notice to join under the Group System before being called up by the Central Office, the M.C.R. Committee secretary should immediately advise the Central Office, and endeavours will then be made to enlist him forthwith in the Motor Cyclists' Section R.E. If for any reason this is impossible, the Central Office will communicate with the secretary of the local

M.C.R. Committee, requesting that the latter should apply to the R.O. to have the man relegated to a later group. The Central Office should be informed of the result of such application. Further, to assist the Central Office in allotting vacancies, candidates should be classified as regards (a) experience, (b) education, (c) physique. Instructions as to how to carry out this classification have been issued, and candidates of the three highest classes will be called up in preference to those of inferior classes, but only subject to the rule as regards taking men of early groups having been complied with.

#### Artificers.

"About one in ten recruits should be qualified to serve as artificers. Such men should have at least two years' experience in the motor cycle trade, and should be capable of undertaking turning, brazing, and fitting operations."





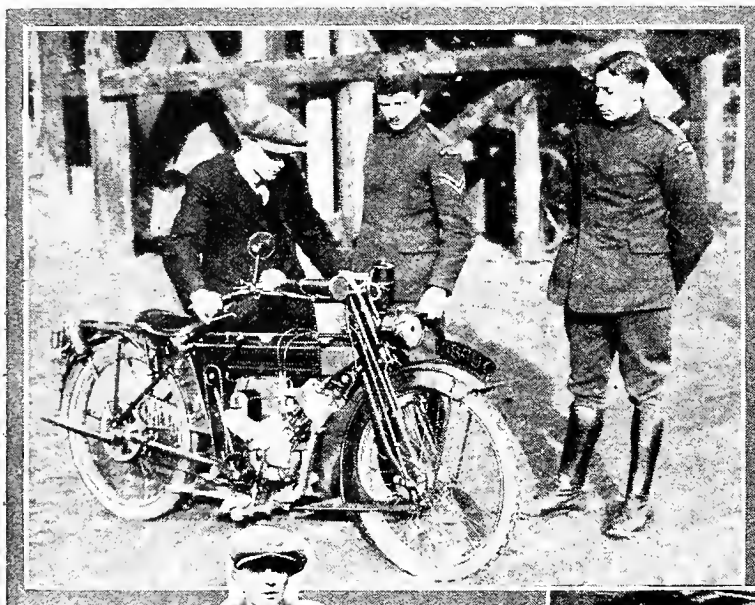
# Recruiting for the Royal Flying Corps.

## Trade-testing Men in Groups 2 to 5.

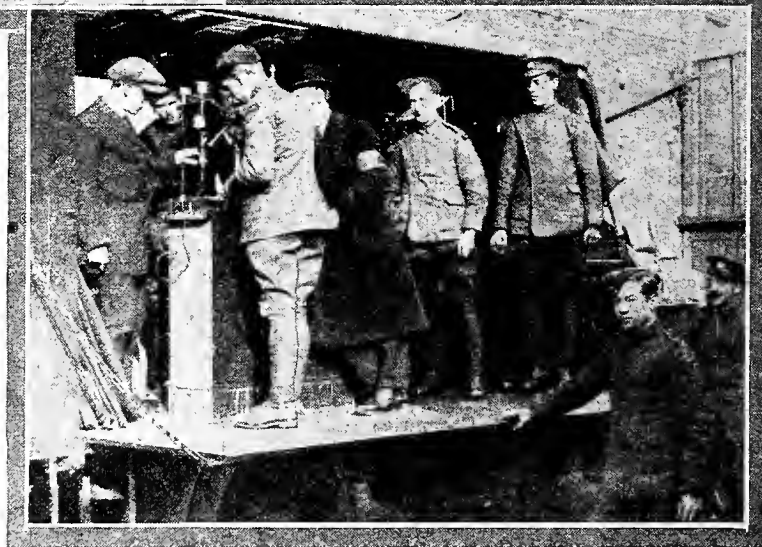
**L**AST week we published extracts from an official notice which had been issued by the Southern Command, respecting the requirements of the R.F.C., which extended to no fewer than 10,000 men. In it we mentioned that a special recruiting party of the R.F.C. would be in Birmingham from the 20th inst. with lorries and machine tools to trade-test the different men offering themselves. The information came into our hands on Tuesday, the 18th inst., and in our desire to assist recruiting, as we have done since the war—and even before the war by our "Military Motor Cycling Notes" feature—we gave details for the benefit of readers. Imagine our surprise, therefore, to receive on Friday and Saturday morning numerous letters from readers who, acting upon the paragraph, had gone to their local Recruiting Office, and had been informed, in several cases, that they knew nothing of the scheme. Birmingham men who went to their Recruiting Offices were

told that the R.F.C. party was certainly in Birmingham, but the only men required were those in Groups 2 to 5. (In the original notice these four groups were debarred.) We were not able to extricate readers from the confusion until the R.F.C. Officer in Charge at Birmingham telephoned to us stating that the instructions we reviewed, though admittedly official, had been countermanded, and that at present only men in Groups 2 to 5 were being tested in their different trades, with a view to being accepted for the R.F.C. This, we were told, applied to all England. The position then, at the moment, is that recruiting generally for the R.F.C. is closed for the time being, except for men attested in Groups 2 to 5.

On this page we publish photographs of scenes in connection with the R.F.C. trades-testing examination (including motor cyclists) now proceeding in Birmingham, of men in the Southern Command.



A MOBILE RECRUITING OFFICE  
FOR THE  
ROYAL FLYING CORPS.



TESTING PROSPECTIVE RECRUITS (GROUPS 2 TO 5) FOR THE R.F.C.

(Upper left) Starting off for a trial run on a P. and M.

(Lower left) Prospective R.F.C. motor cyclist displaying his powers of handling a machine on rough ground.

(Upper right) Questions about the magneto.

(Lower right) The travelling workshop. Examining prospective mechanics.

# Freak Hill-climbing in the Peak District.

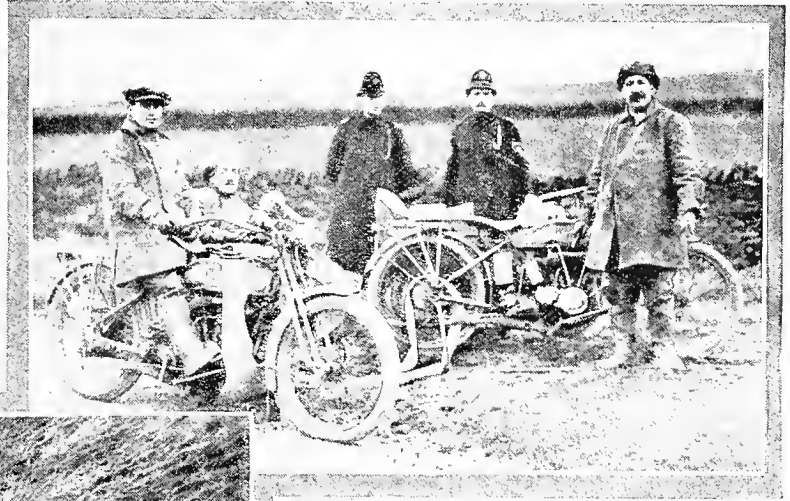
FINE HARLEY-DAVIDSON PERFORMANCE.

A PARTY of Sheffield riders, all mounted on Harley-Davidson machines, visited a new test hill a few days ago in the Peak District. Winnats Pass, as it is known, is near Castleton and just off the main road from that place to Chapel-en-le-Frith, and, as the pictures show, it would come into the freak hill category. Nowadays it is only used as a footpath, but at one time it was part of the main road to Buxton. History has it that many years ago some bad miners murdered a young couple who were making their way up the pass on horseback and hid the bodies under the rubbish of the mine heaps in the immediate vicinity.

Although we are not able to give the actual gradient of Winnats Pass, the photographs reproduced show that it is a very tough proposition both as regards gradient and surface. The latter consists mainly of loose stones, and it is a credit to any machine to make a clean ascent. Eight amateur riders put in an appearance, and everyone got up without mishap—one with two passengers. Such a collective performance speaks well

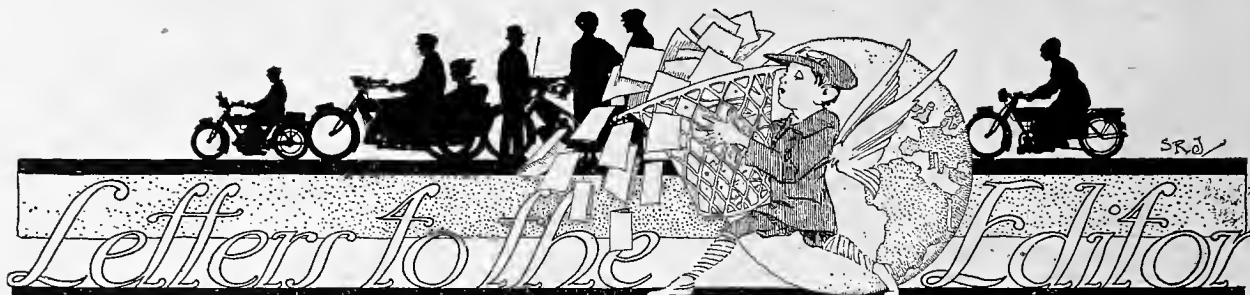
for the hill-climbing abilities of the Harley-Davidson.

With hill-climbing competitions of the recognised nature tabooed owing to the war, trips of the type referred to are the only form of competitive recreation open to busy workers. On the occasion of the Harley-Davidson trip some temporary excitement was caused by a policeman objecting to the camera man, owing to the Defence of the Realm regulations or something of the kind. However, the good man was satisfied eventually.



Photographs taken during the ascent of Winnats Pass described on this page. The top one shows the policemen who objected to photographs being taken. The circle shows the rider, who took up the two passengers on the grass near the top.





The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

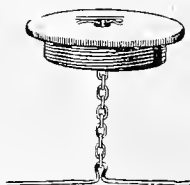
#### Auxiliary Cooling Devices.

Sir,—I was very interested in the article in *The Motor Cycle* of January 20th, and with regard to the subject of the first illustration I should like to make the following suggestion: Would it not be much better to replace the copper tubes by coils of copper wire or by spirals of flat pieces of copper turnings (like an Archimedean screw), because the radiating efficiency of such devices is much better than that of the copper tubing, owing to their having larger surface area per unit volume?

BERNARD E. HAWKINS.

#### Safeguarding Tank Stoppers.

Sir,—As the previous suggestion seemed to me a wee bit unornamental, I am sending you a little drawing which, from its age, commands respect; it is composed of a short length of chain threaded through the hole in the petrol or oil tank stopper, and a piece of stiff wire is attached to hang horizontally inside the tank; it must be slightly longer than the diameter of the orifice in the tank. This has the advantage of being out of sight, and enables the stopper to be usually attached to the tank, but yet readily detachable without the aid of tools.



G. A. EDWARD.

#### Decarbonisation.

Sir,—In *The Motor Cycle* last week your esteemed contributor "Ixion" quotes as part of his experience a single-cylinder motor on which he travelled 10,000 miles and removed the carbon twice in that distance. Also he quotes a hypothetical chain of circumstances wherein it would be possible to have a usable engine after 4,000 miles without decarbonising.

Now I have the privilege of having ridden most of the leading makes of motor cycles, principally of the single-cylinder variety, during the last eleven years, and for the last six years have averaged between 12,000 and 16,000 miles per annum. These engines have, with the exception of one make, required decarbonising at intervals of between 500 and 1,500 miles to ensure satisfactory running, the use of benzole in place of petrol tending towards the higher figure. The exception is the big 4 Norton machine, of which I have sampled two specimens for about 15,000 miles and 11,500 miles respectively. The first has been cleaned out twice, and the latter once. In neither case was the trouble of cylinder removal justified, as very little carbon indeed was present. The machines have had to withstand the vilest abuse, the first one being in continuous use on freak hills and congested traffic for gear testing purposes. The second machine is my own property, and is used mainly for long-distance fast runs (with sidecar, of course) over the hilly Peak District principally, the journey from Nottingham to Manchester (seventy-seven miles between termini) being usually made with three up in two and three-quarter hours. This is fast travelling when the traffic problem at each end is considered. At any time the bare hand may be held continuously on the cylinder, and it is to the cool running properties of this particular engine that I attribute its freedom from carbon deposit. No auxiliary cooling devices are in use.

The usual disclaimer.

J. COHEN.

#### Valve and Tappet Clearance.

Sir,—I have recently been overhauling my 6 h.p. twin, and, as I have had trouble with erratic firing of my front cylinder, I turned up "The Causes of Engine Stops" in December 9th issue of *The Motor Cycle*.

I am happy to inform you that I then discovered my trouble. I did not have sufficient clearance between the exhaust valve stem and the tappet. I noticed that the correct clearance was  $\frac{1}{16}$  in., but that  $\frac{1}{32}$  in. was not excessive in some cases. I therefore struck the happy medium, and sawed off  $\frac{1}{32}$  in. from the valve stem, drilling a new cotter hole and fitting a shorter and stronger spring.

I have now a perfect compression in both cylinders, and am anxiously awaiting the departure of winter so as to try this improvement on the road. TERRA NOVA.

St. John's, Newfoundland.

[Our correspondent's valve must have stretched in a most extraordinary way if cutting  $\frac{1}{32}$  in. off the stem gave the correct clearance! Evidently there is a mistake somewhere.—Ed.]

#### British Machines for British Riders.

Sir,—May I ("Penrot") be permitted a brief reply to "Wots Wright"? He describes his purchase of an American machine as "a fine service to my country," and this pitiful delusion is based on three alleged reasons. The first is a gross misstatement of fact, which, even if it were true, forms a *non sequitur* in his argument of more than usual imbecility. The second is the crux of the whole affair. He ought, if a responsible British citizen, to wait until the British manufacturer can give delivery of his order, and not to show the indecent haste for his new toy which appears to have been the deciding factor in his regrettable purchase. The third reason merely serves to show the hollowness of his contention. He must know that the tariff is primarily to prevent cash going out of the country, and not to raise revenue, and that the money raked in by the Exchequer is no compensation for the larger sum gone abroad.

These are "common facts of earth" patent to all but the most myopic egoists. If "Wots Wright" and those who share his views render many such "services" to their country, I think a few useful words might be written concerning them under the heading of your second leader in your last issue.

A. V. WRIGHT.

Sir,—I have read your correspondent's letter signed "Penrot." "Rotten Pen" would be a better name. It is commendable to boom one's own goods, but to publish such drivel about America, which is supplying all the Allies with the much needed ammunition and war supplies with an expedition unobtainable anywhere else, is another matter. Our workmen must be paid and materials paid for just the same as everywhere else. Our standard of wages is higher, and if you do not like it you should not order from us and then burst out in sickening emanations deserving of the waste paper basket.

DISGUSTED AMERICAN.

Sir,—I know very little of the merits or demerits of American machines, as I have always preferred to buy British-made to any foreign goods. My experience is, therefore, limited to British machines. I have, however, often wished that British manufacturers would turn out a machine with 28 in. wheels and 5 in. tyres for sidecar work; and,

while I sympathise to that extent with Mr. Cartwright, whose letter appears in your issue of the 13th inst., I think the attitude he takes up utterly deplorable. It is only now leaking out to what an appalling extent our trade in all directions had been captured by the unscrupulous methods of the Germans. Our eyes are now opened, and let us hope that German goods are damned for ever in the eyes of our countrymen. I do not suggest for a moment that our friends the Americans should be treated as our enemies, but I do suggest that no Englishman is justified in buying an American machine at the present time. And if a contrary view prevails to such an extent that American machines still continue to be sold in this country, I would urge the Government to treble the tax recently imposed.

"Penrot," in his letter in the same issue, uses strong language, but not a whit too strong. We are fighting for our very existence, and our markets must be preserved for our own manufacturers, whose reputations, as "Penrot" justly reminds us, were never higher than they are to-day. Why anyone should wish to own an American machine when there is such a galaxy of proved and tried British talent on the market I cannot understand.

OI1877.

[Both sides having had a fair hearing, this correspondence must cease.—Ed.]

### A Variable Jet Senspray Carburetter.

Sir,—I notice in your issue of January 15th a description of a handle-bar-controlled variable jet for a Senspray. I have had one in use since last July, and my experience fully bears out that of the writer of the article.

The slide, etc., closely follows that described, except that I use an ordinary Bowden single-lever control. As the writer says, it is very important to get the needle, etc., in line with the jet, so I think a method of doing this with certainty will be acceptable to your readers.

A piece of brass rod is placed in lathe-chuck, and turned down to a good fit in carburetter body where jet goes in. The carburetter body, divested of controls, is placed on this and the clamp tightened. A drill, slightly smaller than the required hole, is held in chuck in loose headstock, and a hole drilled in carburetter body. This is then opened out by means of a small boring tool to correct size. The next problem is to drill the hole in the spray tube for the needle. A small piece of brass rod about 1 in. long was turned to a fit in hole previously made, and a true hole of required size drilled up its centre; I used a  $\frac{1}{16}$  in. twist drill. This piece of brass is then sweated in carburetter in correct position, and used as a guide for drilling spray tube, of course using same size drill. By this means both hole in body and in spray tube will be found to be perfectly true with jet, and no trouble will be experienced in assembling. It may seem a rather troublesome method, but it is well worth it, and there is no danger of damaging carburetter, as might be done by haphazard drilling.

WALTER D. NEEDHAM.

### Some Fads and Fancies.

Sir,—I would like to thank Mr. R. E. Brown for his appreciation, and apologise for not answering sooner. My job here does not allow of getting *The Motor Cycle* every Thursday in time to reply the following week.

Our ideals are apparently in cordial agreement. Regarding Oildag, the vendors state that the small tin (1s. 6d. size) is sufficient for one gallon of oil. I have consistently used this quantity in half a gallon of Price's or Coolie. When an engine is new, a heavy dosing of Oildag, one small tin to a quart of oil, does an engine a world of good in my opinion. The effect on the running is most noticeable when coasting down a long grade with the valve raised. It gives the nearest approach to the silent glide one enjoys coasting down hill on a clutch machine.

Regarding the carburettors, I tried five or six different ones on this type of engine, and for fast touring I use the Senspray. For quieter running I use a three-jet Binks. The Senspray is my ideal as regards comfort of operation. The air lever can be practically a fixture from ten miles per hour to forty miles per hour. The longer throttle lever in the ultra T.T. position can then sit comfortably in the V angle between the thumb and first finger. A slight rotary movement of the hand anti-clockwise opens the throttle for a hill, and a reverse movement closes down

after the up grade has been surmounted. This is the great point about the Senspray for a fast machine; tap twiddling is reduced to a minimum. For an all-out burst the air lever is brought back and the throttle pushed out. The thumb can do all that. With a 38 jet, gear 4 $\frac{1}{2}$  to 1, my mileage varied from eighty-five miles per gallon in hilly Wales to one hundred and twenty miles per gallon in flat Lincolnshire. A 36 jet gave slightly better figures, but I always like the extra life and power on hills given by the extra .002.

I would like to suggest to Mr. Brown that he should lower his gear to 4 $\frac{1}{2}$  or 4 $\frac{3}{4}$  to 1 for ordinary touring. The 79 x 100 Norton engine can "rev." to some tune. He will be surprised at the increased liveliness of his machine, and road speed will not be lost. I shall be pleased to give any further information. A. LINDSAY (CAPT., R.A.M.C.).

### The Mysterious Sidecar.

Sir,—I have read Dr. A. M. Low's letter in your issue of January 13th with interest, and quite agree with what he says. I have ridden solo over one of the worst roads in Manchester on my new patent spring frame motor cycle, and found that absolutely no vibration is transmitted to the frame or rider. To test the machine further I attached an ordinary sidecar, and went out a seventy-mile ride over very bad roads, and found that the rigid wheel to the sidecar transmitted all the road shocks from the wheel to the motor cycle frame, and I could feel the vibration on the handle-bars. This proved to me that to make the perfect combination I must spring the sidecar wheel, and I immediately took out a patent for springing this in a manner similar to the motor cycle, and by this method I am hoping that I have solved the mystery of the sidecar problem.

GEO. E. RIGBY.

### Two-stroke Design.

Sir,—Mr. James Martin's article in your issue of January 20th gives a good deal of information about the theoretical operations involved in the transfer, compression, etc., of gas in a two-stroke. I am not competent to argue as to whether small throttle opening gives as a result a dense mixture of new and exhaust gases or a normal mixture as regards proportions but less dense. I should like to see it argued out.

The point that constrained me to write is that in order to enhance the value of his remedy he has altogether exaggerated the faults of the two-stroke, and his article to a novice would give the idea that it is a very faulty engine. I entirely disagree with the first two of his objections to a two-stroke, namely, (1) "coarseness in running" and (2) "tendency to four-stroke." The first I utterly deny. My two-stroke is far more flexible than any four-stroke I have ever ridden; the second, in a well-designed engine, is simply a matter of correct adjustment of carburetter. I would guarantee to run my Lewis for 100 miles any day at any speeds from 6 to 26 m.p.h. without once "four-stroking."

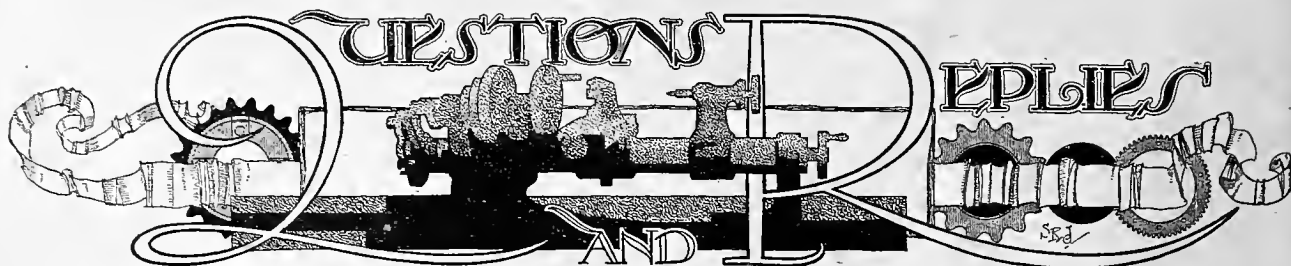
The third objection I agree with to a limited extent only. Careful adjustment and driving will give equally good results as a four-stroke, at any rate as regards petrol. I always get 120 m.p.g. The only single disadvantage I can find is that it requires decarbonising rather more frequently, but then again, this is such a very simple job for any amateur that it hardly counts against it, and certainly weighs very little against the real advantages of lightness, simplicity, reliability, longevity of tyres and belts, excellent hill-climbing, not to mention low first cost.

ROLYAT.

Sir,—May I be permitted to criticise a portion of the article in *The Motor Cycle* for January 20th re "New Design of Two-stroke Engines"? Part of this article reads: "When the throttle is open, say, one-fifth, then only a fifth part of new gas can enter the cylinder, and only one-fifth of exhaust gas is expelled." I admit that only one-fifth of new gas (petrol vapour) is admitted, but no vacuum is created, therefore the other four-fifths are air, this being sufficient to expel the exhaust. Continuing, "The piston has to go through another cycle and force in another one-fifth of gas before the mixture in the cylinder becomes rich enough to ignite." Now I maintain that as long as the throttle is open one-fifth the mixture is always of the same strength, viz., one-fifth gas and four-fifths air, and does not become stronger as the above suggests. Hoping to be enlightened on the subject.

NORMAN.





A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### An Unusual Accident.

[?]

My machine recently broke down on the road, and a passing car driver kindly offered to take it to the nearest town for me.

The help of two passers-by was obtained to lift the motor cycle into the car. While this was being done, the machine slipped and injured the hand of one of the passers-by. This man now claims damages from me, alleging that my negligence was the cause of the accident. I should wish to recompense him, but should like to know if I am legally liable.—R.H.W.

Our legal adviser writes as follows: "If the passer-by can really show that the machine did slip through the carelessness of your correspondent, he can certainly claim damages, but I should think he would have some difficulty in proving this. However, this is entirely a matter of evidence, and without full particulars, showing exactly how the occurrence took place, it is impossible to advise as to the position. What have the driver of the motor car and also the other passer-by to say, and are there any other witnesses of the occurrence?"

### Cleaning a Motor Cycle.

[?]

I want to know the best way to clean mud off my cycle, and at the same time preserve the enamel. The cycle is only six weeks old, but after the bad weather we have had lately it is coated with mud, and I want to give it a good clean and put it away for the winter.—F.S.

On no account should the mud be removed dry, as it would act like emery and scratch the enamel, spoiling the appearance. The best method is to soak the mud thoroughly with water, then remove it by means of a sponge and plenty of water, taking care to keep the water as much away from the bearings and magneto as possible. After removing the mud in this manner, the whole machine should then be cleaned thoroughly with plenty of paraffin. This will overcome the tendency to rust afterwards, and will preserve the enamel. If the machine is not to be touched again for the winter, it would be as well to paint all the bright parts with either vaseline or thick engine oil applied with a brush, and polish the enamel with a wax polish.

### The Warming of the Carburetter.

[?]

I am thinking of getting a two-stroke for short business trips in all weathers. I have been using a two-speed medium weight twin, and had a great deal of trouble last winter owing to the carburetter freezing on early morning trips in spite of additional warming. If I choose a two-stroke with the carburetter behind the cylinder, will it be better or worse in this respect?—J.T.H.

If the carburetter is placed fairly near the cylinder you should get no trouble from freezing. Naturally, if you have a long induction pipe, and if the carburetter is in an exposed position, this trouble occurs. We venture to think that if your carburetter had been really adequately warmed you would not have suffered from this trouble. The most satisfactory way of carrying this out in an air-cooled engine is to take a pipe from the main air intake and draw the air from a position close to the exhaust pipe, or, for preference, from a special chamber fitted up entirely enclosing the exhaust pipe.

### Fitting Dual Ignition.

[?]

I have a 6 h.p. twin-cylinder engine fitted with magneto ignition, and cannot get it started at low speed, so have fitted a coil and accumulator; this makes starting easy at slow speed. Is there any way of fitting the engine to work with both magneto and accumulator ignition, so that I could start up on accumulator, then run on the magneto? At present I have taken off the magneto, and am working with a four-volt accumulator and two single trembler coils. Is this correct? It seems to work all right, and gives a fine spark. I shall be pleased to have your advice, as I have had the magneto examined and put in thorough repair, and still I have difficulty in starting up.—J.F.

Unless you can fit two plugs in each cylinder you will have to fit a high-tension switch, which would not be worth the expense or trouble of installing. The machine, if properly adjusted, should start quite easily with the magneto. You will have to see that there is an efficient spark, and if so we can see no reason why you should not start easily from cold. Take care not to have your

plug points too close together, as too close a gap causes a feeble spark, whereas with a wider gap, say, up to .75 mm., the current has to make a greater effort to jump the distance, and consequently a more effective spark is produced. The contact points should be adjusted to separate .4 mm. by means of the magneto gauge. Always have the spark fully advanced, as a magneto gives the most efficient spark when in this position. You should also take care to see that there are no air leaks at the carburetter or induction pipe unions. What you need for easy starting is a strong mixture and little of it.

### Charging Accumulators.

[?]

I have lately acquired a 1914 7 h.p. Indian with electric equipment. I have heard it is possible to charge accumulators from the public lighting supply by interposing lamps to reduce the current. If it is feasible to charge the lighting accumulators on a 200 volt circuit, will you please tell me how many lamps of each of the following candle-power would have to be used: 25, 50, 75, and 100 c.p.? Could you also give the approximate cost?—B.H.C.

You get, roughly, 1 amp. for each 50 c.p. lamp in circuit, so one lamp would be sufficient to charge, but if you wish to charge more rapidly you may insert as many as three and charge at 3 amps. or more, according to the number of lamps inserted; but this should be regulated by the charging rate of the cells, which should be marked on the side. You can only charge from the main if it is continuous current. It is an expensive method of charging unless the lights are being used in any case. The fact that the accumulator is inserted makes very little difference to the strength of the light. You can connect the accumulator to the switch controlling the necessary number of lamps, taking one wire from each terminal of the switch and connecting the positive wire to the + of the accumulator, and — wire to the — of the accumulator, taking care that the switch is in the off position, otherwise you will short the accumulator, as when charging in this manner the accumulator takes the place of the switch. You can find out which wire is which by dipping them in a little vinegar and water, when bubbles will appear on the negative wire.

**SPECIAL NOTICE.**—Copies of "The Motor Cycle" may only be sent to neutral European countries if posted direct from the offices of the publishers, or by agents who have obtained permission from the War Office for this purpose. The publishers of "The Motor Cycle" have obtained the necessary permission, and, consequently, can send subscribers' copies as usual. Before sending through newspapers it is important to enquire if permission has been obtained as otherwise copies intended for neutral European countries will not be forwarded by the Post Office.

**Failure to Climb Hills.**

I have a 1914 8 h.p. water-cooled sidecar outfit, which I find very satisfactory on the awful Welsh roads over which I have to travel because of its weight and strength. One thing, however, troubles me. I have to climb a rather steep hill on leaving my house; it is quite short, but has about 100 yards with a gradient of from 1 in 4 to 1 in 5. The surface is not bad, but very slippery in wet weather. I cannot get the combination up this hill with a 10-stone passenger in the sidecar (my own weight is 10½ stones) on its low gear of 9 to 1. I may add I am not an inexperienced driver, as this is my eleventh machine. When the weather is inclined to be cold I notice hoarfrost on that part of the induction pipe which is nearest the carburetter, and when this occurs the engine pulls rather sluggishly, and I very often have to close down the air lever of the carburetter to stop misfiring. This is because of the long induction pipe, I suppose. I am using a 33 jet. The engine is in first-class order. (1.) Should this machine be able to take a passenger up the hill mentioned? (2.) Would the frosty induction pipe have anything to do with it not going up, or cause loss of power; if so, which would be the best way to warm it? (3.) What is the smallest tyre I can fit to the driving wheel of this machine with safety? (4.) What speed should I be able to get?—W.L.T.

The running of the engine would be considerably improved by the fitting of a warming pipe—that is, a pipe fitted to the fixed air inlet of the carburetter and brought close up against the exhaust pipe, so that the engine draws in warm air; failing this, a carburetter with a hot air or water jacket would be desirable. (1.) The machine should take a passenger up the hill mentioned when the engine has got thoroughly warm, but you would probably require a gear of 10 or 12 to 1. (2.) Undoubtedly the pulling is affected by the frozen carburetter and induction pipe. (3.) The smallest tyre we should advise for this machine would be a 3in. (4.) About 45 m.p.h. maximum.

**Moisture on Magneto.**

Could you kindly give me advice as to how to rectify the following trouble? My machine is a 1914 3½ h.p., and during the recent wet weather I have either not been able to start the engine or have had to run about 100 yards to do so. Eight weeks ago the makers of the magneto supplied a new contact breaker. The other day nothing was apparently wrong, but I could get no spark. The magneto (armature, make and break, etc.) has since been thoroughly cleaned, and a good spark obtained, but there is still a great difficulty in starting. The platinum points are correctly set, also the plug points, and I have thoroughly cleaned the Senspray carburetter with paraffin, and tried two different jets. On the day before the trouble started I fitted a zinc mudsplash to the bicycle. This does not touch any terminal of high-tension cable or plug, but is as near as ¼ in. to the magnets. Could this possibly affect the ignition?—E.E.P.

The trouble is possibly caused by moisture condensing either on the magneto or on the plug or high-tension wire. You should make sure all parts are perfectly dry, especially the high-tension wire and carbon brush and holder. In damp weather the rocker arm in the contact breaker is very liable to stick owing to the fibre swelling with the damp. You should make sure this is working quite freely. Cleaning the carburetter with paraffin is likely to do more harm than good. In cleaning a carburetter all that is necessary to do is to loosen any particles of dirt or fluff which may have collected and rinse out with clean petrol. Do not push anything through the jet to make sure it is clear; blow through it with the mouth or by means of a cycle pump. The zinc cover would not cause any trouble unless it was touching either the high-tension terminal or the contact breaker terminal; simply being near or touching the magnets would have no effect. If you suspect damp in any part it would be as well to store the machine in a warm room, but not near a fire, when the condensed moisture would be evaporated. Do not

flood the carburetter too freely before starting. To start, close the air lever, and do not give more than a quarter throttle opening. Try a new plug, the old one may be faulty.

**Misfiring.**

I shall be obliged if you will kindly give me your advice with respect to the following matter: I have a 1914 T.T. Douglas which has run splendidly until about a fortnight ago, when I took off the cylinders and ground in the valves. The trouble is that the machine ceases to fire in the front cylinder at speeds about 12 m.p.h. or under. The engine is fast when the throttle is opened, and fires in both cylinders. I am using a No. 24 Amac jet; a No. 26 improves the firing at slow speeds, but the engine is not by any means as fast as with the 24 jet. I have tried the plugs in each cylinder, and there appears to be a satisfactory spark. I am certain the trouble is in the front cylinder on account of it remaining cooler than the back. The valves are free in their guides, and there is sufficient clearance between the valves and the tappets.—H.B.

The trouble is probably due to an air leak in the induction pipe. See that the induction pipe nuts are sufficiently tight, and be quite sure that the valve clearances are equal in every case, and that all the valves are seating correctly; also make sure that the plug of the cylinder that is giving trouble is in good order, and the points adjusted to the correct distance, viz., about ⅜ in.

**EXPERIENCES WANTED.**

Readers desirous of obtaining the experience of others with various motor cycles or accessories must enclose a stamped addressed envelope in which the replies may be forwarded. Answers to the queries should be addressed c/o The Editor.

“A.C.R.” (Middlesex).—Grado Multi pulley on 2½ h.p. twin.

“C.R.C.” (Bristol).—2½ h.p. Peco and sidecar. Load carried, gears used, consumption, and reliability.

“F.P.” (London).—Binks spirit for Scott. Power, consumption with sidecar, effect on engine, and general efficiency.

“R.L.” (London).—Binks carburetter on a 5-6 h.p. single-cylinder engine, which now goes best at high speed.

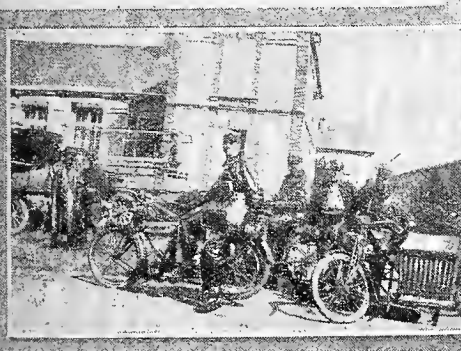
**RECOMMENDED ROUTES.**

GRAVESEND TO ALLINGTON.—H.C.

Gravesend, Meopham, Wrotham, Ightham, Riverhead, Westerham, Godstone, Redhill, Reigate, Dorking, Guildford, Hog's Back, Farnham, Odiham, Hook, Basingstoke, Whitechurch, Andover, Weyhill, Thruxton, Cholderton, Allington.

HERNE BAY TO CAMBORNE.—T.B.

Herne Bay, Sturry, Canterbury, Charing, Maidstone, Wrotham Heath, Ightham, Riverhead, Westerham, Redhill, Reigate, Dorking, Guildford, Hog's Back, Farnham, Alton, New Alresford, Itchen Abbas, Kingsworthy, Winchester, Romsey, Cadnam, Ringwood, Wimborne, Bere Regis, Dorchester, Bridport, Lyme Regis, Colyford, Sidford, Exeter, Okehampton, Launceston, Bodmin, Mitchell, Zelah, Redruth, Camborne.

**BRITISH MOTOR CYCLES WITH THE FRENCH ARMY.**

(Left) Triumph-mounted despatch riders attached to a lorry convoy. The one on the right has a sidecarrier attached.



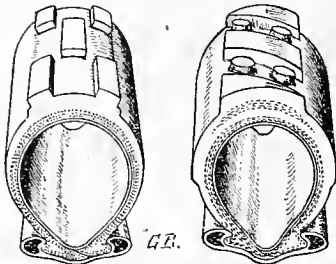
(Right) A few N.C.O.'s with a Rudge.

## TYRES AND CLOTHING.

Novelty is less pronounced in this section. Nevertheless many useful and novel designs of non-skid tyres and highly practical garments for motor cyclists are dealt with. The suitability of motor cycling apparel in warding off cold and wet is proved by the fact that covering originally designed for motor cycling is being largely used by the Army for trench wear.

### Rom Tyres.

When one mentions combination rubber and steel treads Rom tyres are instinctively thought of, as the Rom Tyre and Rubber Co. were practically the first manufacturers to make this type of cover, which has become so popular among motor cyclists for both winter and summer riding. As most of our readers know, the combination non-skid is composed of rubber bars alternating with steel studs. The idea is that on wet and greasy roads steel studs make the ideal



Rom rubber non-skid.

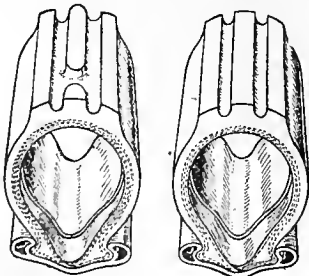
Rom combination tread.

non-skid, whereas in dry weather the rubber non-skid is to be preferred; the combination tread, therefore, makes an excellent compromise. Besides the popular combination cover the Rom Co. also make a rubber-studded pattern the studs of which are of square section. This cover is sold at a moderate price, which renders it an attractive proposition. A pattern similar to the combination cover is also sold, but minus the steel studs, and forms a hard-wearing cover. Rom tyres have been used extensively on the motor machine gun sidecars at the Front.

The Rom Tyre and Rubber Co., Ltd., 36, Brooke Street, Holborn, London.

### The Gamage Tyre.

The Gamage tyre is a particularly well-made article, and is of the ribbed pattern, which forms a most efficient non-skid.



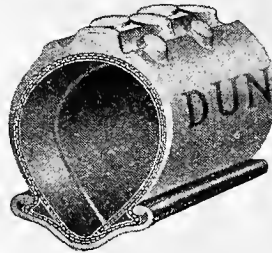
Two varieties of the Gamage ribbed cover.

There is ample thickness of rubber in the tread, while the casing is specially strengthened by many layers of the best quality canvas.

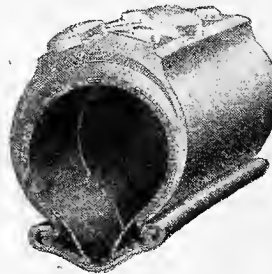
Messrs. A. W. Gamage, Ltd., Holborn E.C.

### Dunlops.

The chief novelty that Messrs. Dunlops have produced for 1916 is a rubber-studded beaded edge cover for light-weight machines, made for 24in. and



26in. wheels, and of 2in. and 2½in. section. The tread is a combination between the grooved and studded patterns, and is efficient against skidding. An interesting tyre is the combination

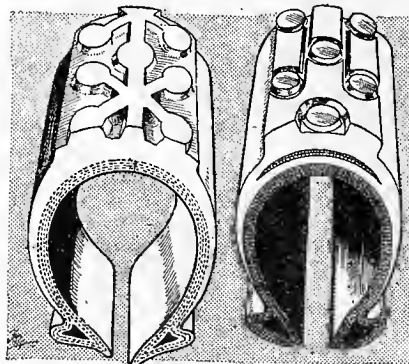


rubber type, specially designed for passenger work, made for 26in. wheels, from 2½in. to 3in. section, also for 650×65 mm. voiturette rims, and in the 700×80 mm. size.

Messrs. The Dunlop Rubber Co., Ltd., Aston, Birmingham.

### Clincher.

An interesting pattern of Clincher tyre is known as the De Luxe, which is a substantial cover in which the tread is composed of studs joined by ribs forming a



Clincher De Luxe cover.

Clincher combination tread.

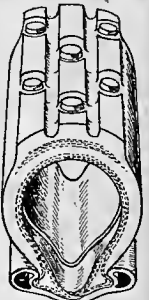
curious star pattern; it should be efficient as a non-skid until worn down. The rubber has been changed from grey to a tough white quality, and has been considerably improved in durability, since the cross ribs between the studs give a larger wearing surface. It is suitable for all makes of machines.

Another popular Clincher tyre is the combination pattern, the tread of which consists of rubber and steel studs embedded flush with the ribs. It has been specially constructed with a heavy casing to stand the strain of the driving wheels of high-powered motor cycles. The unique tread design ensures an efficient non-skid under all road conditions, and the studs are so securely anchored that they will not pull out with ordinary usage. It is made to fit voiturette rims.

The North British Rubber Co., Ltd., Clincher House, Great Portland Street, London, W.

### Avon Tyres.

The Avon India Rubber Co. have strengthened their combination cover, which is of the three-ribbed variety, the steel studs being countersunk in the ribs, making it suitable for machines of any horse-power. They also purpose, if possible, to put down moulds for making their Sunstone covers on the 28×3in. size, suitable for American motor cycles. They also hope to be able to add a 650 mm.×65 mm. three-ribbed and also an oversize cover of the same type to fit the same rims, which are frequently met with on high-powered machines.

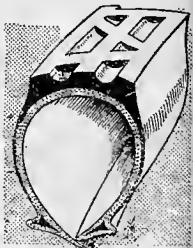


Messrs. the Avon India Rubber Co., Ltd., 19, Newman Street, Oxford St., W.

### Spencer-Moulton.

One of the most attractive tyres turned out by Messrs. Spencer-Moulton is the three-ribbed pattern, which we have used ourselves, and have found to be a most efficient non-skid. This tyre is recommended for general all-round utility; has excellent wearing qualities, and is very speedy. Owing to the ventilation of the tread afforded by the circumferential grooves and scientific method of construction adopted, the tyre keeps extremely cool and the minimum of friction is set up.

Messrs. George Spencer, Moulton, and Co., Ltd., 77, Cannon Street, E.C.



## Tyres and Clothing.—

## Palmer.

A most attractive cover has been lately placed on the market by Messrs. the Palmer Tyre, Ltd. It costs a great deal less than the Palmer Cord tyre of the same size, but is exceedingly durable, while the tread is of excellent rubber. The section which was shown to us had one of the ribs sliced for some little distance, and it was found to be quite impossible to pull off this piece of rubber. The tyre is made in the 28in. x 3in. size to fit 650 mm. x 65 mm. rims, or with a smaller bead for



26in. x 2½in. motor cycle rims; it can also be had in the 700 mm. x 80 mm. size to fit the rims referred to, as well as in the usual sizes. The tyre is built up of four plies of fabric, the strands of which run diagonally across the cover, alternately in opposite directions. This renders the cover exceptionally strong, and excellent results are being obtained from it. The inside is covered with a white paint, and in the event of a serious cut this paint may be scraped off and an internal patch applied. In these days when economy has to be studied, the introduction of the new Palmer four-ply fabric tyre will be much appreciated.

Messrs. the Palmer Tyre, Ltd., 118-123, Shaftesbury Avenue, E.C.

## Bates Tyres.

Among the several different pattern tyres sold by Messrs. W. and A. Bates, Ltd., probably one of the most serviceable is the No. 2 motor cycle tyre—the one illustrated. It is of the three-rib pattern, but the centre rib is broken at intervals, thereby giving a better grip on greasy roads and preventing wheel spin. The firm also make many useful accessories, one of which is the clip-on gaiter for fitting on the outside of a burst cover, while the tube gaiter which laces over the tube to prevent it blowing out of a damaged outer cover should also prove very serviceable. The Bates motor cycle tyres have been extensively used by the South African Defence Force in the German South-West Africa campaign. The firm also hold a two years' contract to supply tyres to the South African police throughout the whole of the Union.

Messrs. W. and A. Bates, Ltd., St. Mary's Mills, Leicester.

## "Stoppit" for Punctures.

Stoppit is a white glistening powder which, when mixed with water, forms a puncture-sealing solution. It is injected into the inner tube, where it will remain active as long as the tube is in use.

Stoppit, Ltd., 66, Moore Street, Birmingham.

## The Stelastic Tyre.

One of the most popular motor cycle tyres is the Stelastic ribbed "Chock-bead" cover. This is a practical non-skid unpuncturable tyre, which contains the qualities of the ribbed tyre and the non-cutting propensities of the Stelastic tread, which, as our readers will remember, consists of upstanding coils of steel wire embedded in rubber. The canvas



Stelastic ribbed tread.



Stelastic round tread.

used for the casing is of the best quality, so that side bursts are greatly minimised, while the walls are supported by the extra thickness of rubber extending from the tread to the beads. The illustration shows the particular form of bead fitted, and how securely it locks itself on to the rib.

Messrs. Stelastic Tyres, Ltd., 76, York Street, Westminster, S.W.

## Hutchinsons.

For 1916 Hutchinson tyres consist of the rubber-studded and the three-ribbed patterns in various sizes and types, the best known of which are the Brooklands, the Tourist Trophy, and the Passenger. The quality of Hutchinson tyres, which has so long been famous, is still maintained, and this quality was only obtainable after much money had been spent in the extensive laboratories at the Hutchinson factory in France. The rubber used in Hutchinson tyres is remarkable for its toughness and resiliency. A specially substantial three-ribbed tyre built up on four plies of the strongest canvas is suitable for use on heavy sidecar machines. It is made in the 650 mm. x 65 mm. size and 650 mm. x 65 mm. to fit 65 mm. rims, also 700 mm. x 80 mm. to fit the same rims. The well-known Hutchinson motor cycle boot, which has proved so invaluable in the trenches, is still listed.

Messrs. Hutchinson Tyres, Ltd., 70, Basinghall Street, E.C.

## The Kempshall Cover.

There is no change in Kempshall tyres for the coming season. The chief speciality is a 650 mm. x 65 mm. tyre of the well-known Kempshall non-skid pattern, designed to fit 700 mm. x 85 mm. rims. It is especially suitable for sidecar work, and on a sidecar combination it is said that 15,000 to 18,000 miles can be obtained on these covers. It is specially strengthened, and has five plies of canvas.

Messrs. the Kempshall Tyre Co., Ltd., 98-100, Long Acre, W.C.



## Hermetic Peerless Tyres.

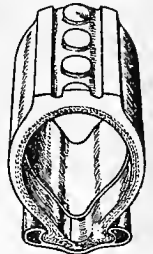
The Self-sealing Rubber Co. are now making their special heavy Hermetic Peerless motor cycle tyres in 28x3 size to meet the increasing demand for this size of tyre on both the home and Colonial markets. The pattern is the same as on the smaller sizes, viz., three ribs, the centre one being formed in a zigzag pattern to give a good grip in both directions.

The Self-sealing Rubber Co., Ltd., Hermetic Works, Birmingham.

## Stepney.

The Stepney Spare Wheel Co., who have long made tyres for cars, have now turned their attention to a cover suitable for motor cycles. It is a combination of the ribbed and studded patterns. The tread is formed by two rubber ribs running round the side, while the centre is formed by a row of rubber studs. The advantages are that the tyre combines the features of both types, the ribs preventing side-slip, while the studs give a good grip for the forward drive and braking action.

The Stepney Spare Motor Wheel, Ltd., Stepney Works, Llanely.



## Excelsior Retread.

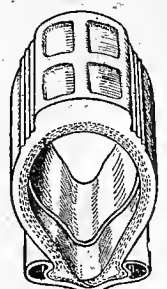
Messrs. the Excelsior Rubber Co. specialise in retreads, and are experts in all other types of tyre repairs. They claim to be the oldest established firm in the United Kingdom specialising in tyre repairs.

The Excelsior Tyre and Rubber Co., Hurst Street, Birmingham.

## Wood-Milne.

The extra strong "special" cover has four layers of canvas as support, and, on account of its strength and thickness of tread, can be recommended for heavy work. The road wearing surface is formed into squares, the ridges thus formed greatly assisting in the stability of a motor bicycle in grease.

A useful Wood-Milne accessory is the adjustable belt punch, which ensures the hole being drilled centrally. A sample is presented free to buyers of W.-M. tyres. Messrs. Wood-Milne, Ltd., Preston.



## Skew.

Skew covers are noted for their long wearing qualities. A liberal amount of first-class quality rubber on the tread ensures this longevity.

The Skew cover is sold in all sizes for motor cycles and runabouts, and the formation of the tread, which is composed of staggered indentations, possesses great anti-skidding qualities.

Messrs. Oylers, Ltd., 35, New Cavendish Street, Great Portland Street, W.



**Tyres and Clothing.—****A Chamois Leather Waistcoat.**

At Messrs. Taylor's we saw some very excellent chamois leather waistcoats, which motor cyclists will find especially comforting at this time of the year on cold days. The chamois leather is extremely pliable and comfortable to wear, and is also very warm. The waist-



coat in question is supplied with pockets, has a strap behind, long sleeves, and button cuffs, and is designed to button close up to the neck.

Waders with leather soles, which will keep the rider's extremities dry in any weather, are another speciality of this firm. We were also much pleased with a fleece-lined raincoat, which can be used either for motor cycling or walking.

Messrs. H. Taylor and Co., Ltd., 21a, Store Street, Tottenham Court Road, W.C.

**Clothing at Brown Brothers.**

Not many people are aware that Messrs. Brown Bros., Ltd., have a clothing department. Recently we made an inspection of this, and were most favourably impressed. One of the most practical motor cycling suits is made of the best quality water-proof material. The trousers are of the half-seat type, and adequately protect the front of the body. The coat is double-breasted and provided with a useful storm flap which prevents the rain from penetrating. It is interesting to note that a number of these have been supplied to the Belgian Government. We also saw some leather waistcoats and some remarkably fine tan cap

driving gloves lined with llama wool, which are both soft and very strong. They are sold at a very moderate price and appear to be excellent value for the money.

Messrs. Brown Bros., Ltd., 15, Newman Street, W.

**A Motor Cyclist's Coat.**

It is a curious fact that the war has not only brought the importance of the motor cycle before the general public, but motor cycling clothing has been used to a very large degree by military units which have nothing whatever to do with motor cycles. The motor cycle wader has been proved to be invaluable in the trenches, and the same may be said of the leather waistcoat. Oilskins, too, are in great demand. Now, the coat which we illustrate herewith was primarily intended

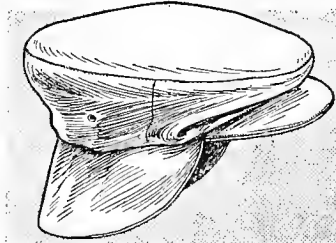


for the military, but with the very smallest amount of alteration it can be made suitable for the motor cyclist. It is one of Messrs. Dunhill's best productions, and is well cut in proofed twill and lined with camel fleece. Between the camel fleece and the twill is a lining of oil silk, which thus prevents any wet from reaching the wearer. It is provided with a belt and a strap round the waist, so that it excludes the wind. It has a particularly well designed collar, which is secured by a strap, and so arranged that it may button well out of the way when out of use. A very good point about it is that a spot of oil (though, of course, it will stain the coat) will not in any way interfere with its impermeability.

Messrs. Alfred Dunhill, Ltd., 359-361, Euston Road, N.W.

**A Motor Cycling Cap.**

Messrs. John Piggott's outfitting department is very completely stocked



with all that the motor cyclist needs to keep him warm and to exclude rain.

Motor cycle suits are to be found in all qualities, and to suit all pockets.

While looking round the clothing department we saw a very useful cap, an illustration of which is reproduced herewith. It will be noted that it is provided with a flap at the back which folds down, and thus prevents rain from getting down the rider's neck.

We also inspected several leather waistcoats, numbers of which have been supplied to officers for use in the trenches. They possess the advantage of being well ventilated.

Messrs. John Piggott, Ltd., 117, Cheapside, E.C.

**Smart and Useful Overalls.**

The overall suits made by Messrs. Mosely and Smith undoubtedly combine smartness with utility. The suit illustrated is made of thoroughly proofed material lined with tweed. It has four pockets, while the special watertight fastening in front renders it very suitable for cold and wet weather. The complete trouser overalls are made with an elastic band at the top, which renders them very convenient, obviating the fastening or unfastening of buttons or buckles. The legging portions are fastened by patent fasteners.

Messrs. Mosely and Smith, Butter-shaw, Bradford.

**A Motor Cycle Coat.**

A particularly practical motor cycle coat is sold by Messrs. Charles Cuthbe and Co. It is an improved form of the old-fashioned poncho, which is particularly effective in excluding the wet. There is no opening whatsoever except for the head, and therefore it is impossible for wet to get in. The neck opening is a type of gusset, and therefore should serve its purpose exceedingly well. The coat is provided with a belt.

Messrs. Charles Cuthbe and Co. are also known to our readers as the vendors of the Max motor cycle tyre and the Max belt, which latter is fitted with a special carefully centred core, and can be had in lengths of 60ft. It is composed of Ceylon rubber specially toughened.

Messrs. Charles Cuthbe and Co., 37, Great Eastern Street, E.C.



**Tyres and Clothing.—****Sidcar Shock Absorbers and a Cleaning Outfit.**

A useful sidcar fitment is sold by the Service Co. to interpose between the spring eye and the cross bar supporting the body. It has a shackle action, and the springing is in compression. This should greatly add to the passenger's comfort, as it tends to absorb all the smaller road vibrations, and should be much appreciated at the present time on account of the bad state of the roads in many parts.

Messrs. The Service Co., Ltd., 292, High Holborn, W.C.

**Clothing at Burberrys.**

For many years the firm of Burberrys have made a special study of the requirements of the motor cyclist as regards clothing, and riders are now able to purchase the very latest designs in motor cycle suits built up of the renowned Burberry material. One of the most ingenious motor cycle suits we have seen is the



Burberry Tielockan coat. It is a buttonless, double-breasted garment, mainly secured by a single strap. Inside the coat is a small strap which fastens a portion of the coat by means of glove button fastenings, the rest is pulled over into position, and the strap, which possesses two patent buckles, is then secured with the greatest celerity. This suit is made of the best Burberry Gabardine, and can be had lined with wool, fleece, or leather. It is fitted with excellent pockets, which enable one to have access either to the pockets of the Tielockan coat or to those in the inner coat. The back of the coat is slit behind, while the strap is also arranged so that it is adjustable at the back of the garment.

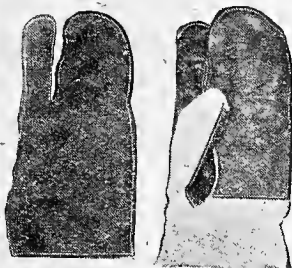
We also saw an attractive looking motor cycle coat, fitted with what is known as the Puttee collar, which means that the neck is secured by means of a long strap, which goes twice round, and then fastens up with glove button fasteners.

Quite a novelty in the way of gloves is the new Burberry Gabardine glove. The palms and fingers are covered with the best leather, while the back is of Burberry material lined with wool.

Messrs. Burberrys, Haymarket, S.W.

**Grose's Transport Gloves.**

Grose's transport gloves are very practical articles, and are eminently suitable for use by motor cyclists. The back is made of waterproof material, while the



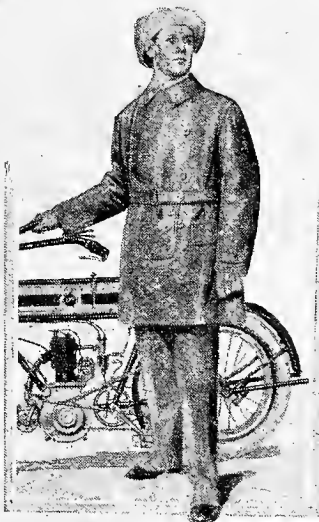
palm, thumb, and first finger are composed of the best leather. The rest of the glove is of soft leather, while the interior is of natural lamb's wool. The gloves are extremely warm.

As regards clothing, Messrs. Grose make a speciality of the Brooklands motor cycle suit, which is made of waterproof material. It is absolutely proof against the elements, and is of a most durable quality. Either seatless trousers or leggings may be had with this suit.

Messrs. James Grose, Ltd., 4, Old Jewry, E.C.

**The Aquacall Motor Cycle Suit.**

Messrs. A. W. Gamage have lately placed on the market a very excellent motor cycle suit known as the Aquacall. It follows very much the lines of the ordinary motor cycle overall suit, but is made of waterproof cloth instead of ordinary macintosh, and for winter use it is fleece-lined. Numbers of these are being sold to military motor cyclists. It is fitted with a belt and wind cuffs.



The leggings are slipped on, and there is no fastening at the side at all, as they are kept in position by means of an elastic strap under the boot.

Messrs. A. W. Gamage, Ltd., Holborn, E.C.

**A Serviceable Motor Cyclist's Suit.**

Messrs. Selfridge's clothing department has taken up the question of motor cyclists' clothing in a very practical manner. They have lately introduced a

riding suit, the material of which has the appearance of ordinary cloth. Actually, however, it is perfectly waterproof, and is of double texture throughout. The particular sample shown to us was of a drab colour, and of just such an appearance as one would find in a light overcoat. The effect is really quite attractive. The sleeves are provided with wind cuffs inside and a wind strap outside, and there is also a belt round the jacket. The trousers are of the semi-seatless type, and are so designed that they protect the rider's body in front. The legs are gusseted, and are supplied with glove button fastenings.

Our illustration shows the Selfridge double-texture waterproof suit, which is



somewhat similar to the one we have just described in design, except that the leg overalls are provided with straps round the ankles.

Messrs. Selfridge and Co., Ltd., Oxford Street, W.

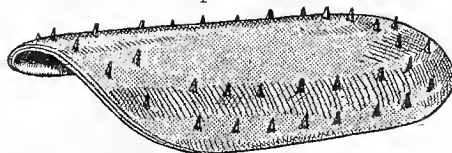
**A.K. Specialities.**

The A.K. clothing specialities are too well known to need illustration. Leather waistcoats, throat protectors, and leather racing helmets with ear rolls (often used by tourists) are the leading lines. We can speak of the quality of A.K. accessories from personal experience.

A.K. Manufacturing Co., Birmingham.

**The Chemico Blow-out Patch.**

An exceedingly useful accessory is the Chemico Blow-out patch, which owes its *lucus a non lucendo* title to the fact that it does not blow out itself, but prevents the tube from doing so. The patch consists of a specially prepared canvas, through which numerous spikes protrude. These spikes embed themselves



into the cover round the burst, and, therefore, securely anchor the patch by the pressure of the inner tube underneath. The American patents for this patch have been purchased by the County Chemical Co., Ltd.

County Chemical Co., Ltd., Chemico Works, Birmingham.

# IGNITION APPLIANCES AND LAMPS.

A perusal of this section leaves one with the distinct impression that electric lighting is rapidly gaining in popularity for motor cycles as well as cars. Probably lighting dynamos will become general ere long. It is gratifying to record an improvement in the quality and numbers of British magnetos, whilst it is generally admitted that British-made sparking plugs are second to none.

## The Simms Sparking Plug.

The Simms is a well-made plug provided with substantial electrodes. From its design, we should say that it should be most unlikely to soot up. The insulating material is of porcelain.

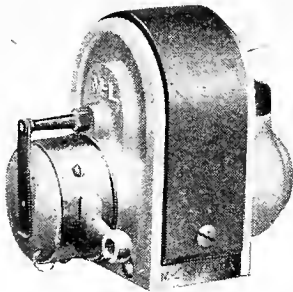
Messrs. Simms Motor Units, Ltd., 191, Wardour Street, W.



## M.L. Magneto.

The M.L. magneto, which is entirely made in Coventry, is certainly a most workmanlike job. The general outlines closely resemble those of the Bosch.

These machines are at present made in three types, each type being made in both standard and lightweight models. The types are for singles, horizontal twins, and V twins between 50° to 60°. These magnetos are very thoroughly tested,



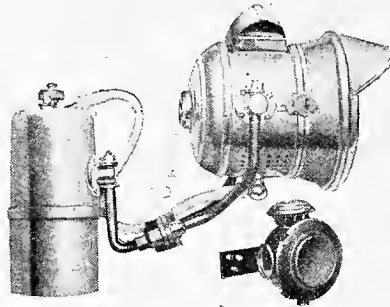
which test includes a six-hour endurance run at high speed, and a limit test for sparking at low speed and for the energy contained in the spark. The demand for these magnetos has been so great that the firm have been obliged to take over much more extensive premises, into which they will move shortly.

The M.L. Magneto Syndicate, Ltd., Carlton Works, Coventry.

## The J.P. Head Lamp.

A head lamp which is excellent value for the money asked for it, and is sold complete with generator, is the J.P. It will be noticed that the bracket fixing is such that it complies with the Defence of the Realm regulations.

A very neat tail lamp in oxidised finish was also shown to us on the occasion



of our visit. Both it and the head lamp are British made.

Messrs. John Piggott, Ltd., 117, Cheapside, E.C.

## The Dumolite Rear Lamp.

Seeing that rear lamps are practically everywhere compulsory in this country, we direct attention to the Dumolite motor cycle rear light, which was early on the market as one of the most practical leaders of this type. The lamp is cast out of solid aluminium, together with the bracket, and well finished. It is provided with a tap at the base, and has also a white

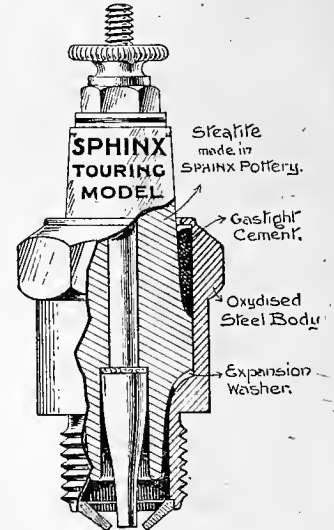
glass at the side, so that it may be used for illuminating the rear number.

Messrs. A. J. Dew and Co., 21-23, Endell Street, Long Acre, W.C.

## Sphinx Plugs.

The Sphinx Co., which has been for some time unable to give prompt deliveries to the general public of its well-known spark plugs owing to the demands of the Government, is now able to supply more quickly, and is fast making good its overdue orders. The firm has now established its own pottery for the manufacture of steatite insulators, and so claims to be the only manufacturer of purely British steatite plugs. The touring model plug is of the two-gap type, the central electrode is of a most substantial construction, and the other two electrode points are made of iridium. The steatite insulator is secured in the

oxidised steel body by means of gastight cement, while in the other two models, C28 and A3, this is secured by means of a locking nut.



Messrs. the Sphinx Manufacturing Co., 242, Bradford Street, Birmingham.

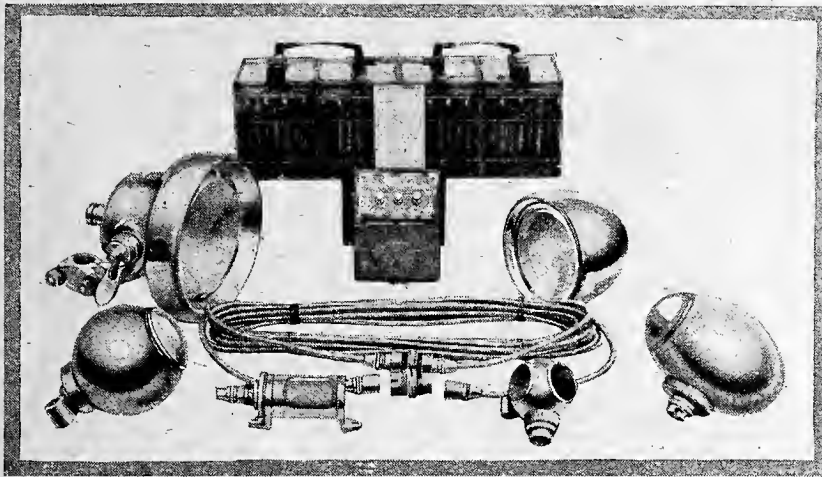
## C.A.V. Magnetos and Lamps.

While at Messrs. C. A. Vandervell's we recently saw the latest pattern sidecar combination electric lighting outfit. In this case the source of current is a large 33 ampere-hour 8-volt accumulator, for the storage of which there is plenty of room in the sidecar. Sold with this set is a very neat switch-box, designed to be clipped on to the top tube. The outfit comprises a powerful head lamp for the motor bicycle, two types of tail lights, and two types of sidecar side lamps, as well as a small inspection lamp, together with the necessary cable.

Messrs. Vandervell have also for a long time devoted their attention to the manufacture of C.A.V. Ruthardt magnetos, and we illustrate herewith eight magnetos, suitable for various patterns of motor bicycles, such as Norton, B.S.A., Rudge, Douglas, and Triumph. The variation generally occurs in the shape of the baseplate, the height



The range of C.A.V. British-made magnetos



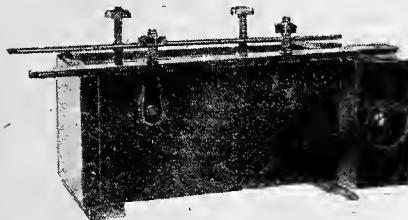
New C.A.V. sidecar lighting set.

of the spindle, and type of spindle. Some of these magnetos are also provided with means of fixing a Bowden control, while other variations occur in the design of the advance spark lever.

Messrs. C. A. Vandervell and Co., Ltd., Warple Way, Acton Vale, W.

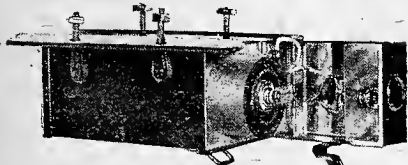
#### A Combined Rear Lamp and Number Plate.

Quite a good rear lamp for motor cycles and sidecar combinations has been placed on the market by A. W. Bond. The case contains a dry battery, as will be seen in the illustration, and



Bond's self-contained rear lamp.

the lid thereof contains an electric bulb, switch, and red light, which shows to the rear and illuminates the number which is painted upon the exterior of the box. The case is fitted transversely at the rear of the luggage carrier. The whole device is waterproof, contains a



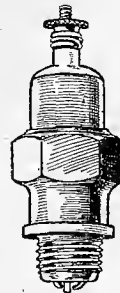
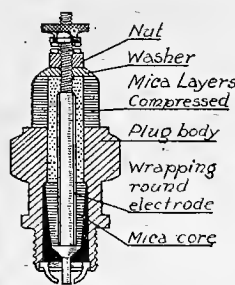
Bond's self-contained rear lamp showing bulb, battery, and windows of red and white glass.

large battery, which lasts for sixty to seventy hours, and costs but 2s. to replace. The bulb is mounted on a spring, so that it cannot be damaged by vibration. There are no external wires, and consequently the lamp should be a most reliable one.

A. W. Bond, 245-247, Euston Road, N.W.

#### The Apollo Plug.

A well-made and substantial plug is the Apollo high compression plug. This plug is specially designed to withstand the high compression encountered in aero and some motor cycle engines. The insulator of this plug is made of mica

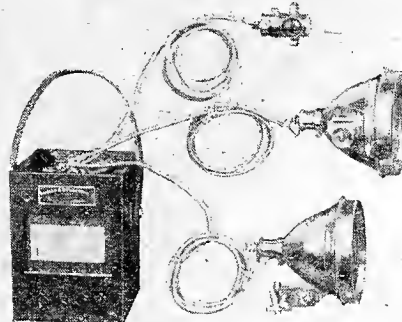


by a special process, and the plugs are tested to a pressure of 500 lb. per square inch. The electrodes are of the two-gap variety and are very substantial.

Apollo Mfg. Co., Moseley Street, Birmingham.

#### Some Ward and Goldstone Lamps.

Messrs. Ward and Goldstone have lately devoted considerable attention to electric lighting on motor cycles. The



accumulator used with the sidecar combination set is 7in. high by 4½in. x 5½in., and when charged will provide a current

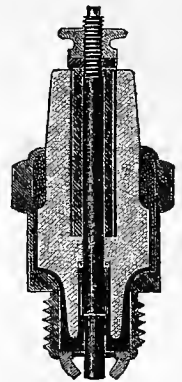
giving from fifteen to twenty hours continuous work. A separate switch is fitted to each lamp.

This firm has also placed on the market a special motor cycle lighting set known as the Penetra, consisting of a motor cycle head light complete with metal filament bulb, twin armoured conducting cord, switch, and four-volt Volex Giant battery, which gives up to sixty to eighty hours lighting. This can also be supplied with a tail lamp.

Messrs. Ward and Goldstone, Sarapson Works, Salford, Manchester.

#### The Forward Spark Plug.

The new type M Forward plug is of the two-gap variety, the three electrodes being very substantial. The points where this plug differs from the previous patterns are that the outer insulator is fixed into the metal body by means of a patent enamel which ensures the plug being absolutely gas-tight. To prevent any likelihood of trouble due to an accidentally cracked insulator, an inner one made of mica is fitted which effectually prevents short circuits from this cause.

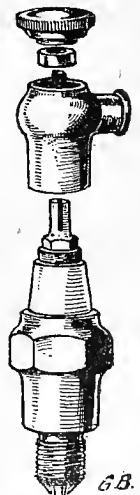


The Forward Motor Co., Summer Row, Birmingham.

#### Bluemel Accessories.

Most of the accessories sold by Messrs. Bluemel for the use of motorists are so well known that even a passing mention is almost unnecessary. An accessory which is familiar to practically every motor cyclist is the handy tyre inflator with folding stirrups; the usefulness and

excellent workmanship of this have made it universally popular. Another fitting sold by this firm, and which we illustrate, is the Shortproof plug terminal; this consists of a cap made of a kind of vulcanite, which fits over the plug terminal to protect it from rain or damp. The terminal is easily detached by merely pulling off. The spigot on to which it is pressed is screwed on to the plug terminal and is detachable; being screwed to a standard thread, it is suitable for practically any make of plug. Our illustration shows it as fitted to a Bluemel Steatite insulator plug. The sidecar windscreen made by this firm is also a useful fitment. It is made with a light tubular frame, the transparent portion being of celluloid. It is adjustable, and can be moved instantly to allow of entering the car.



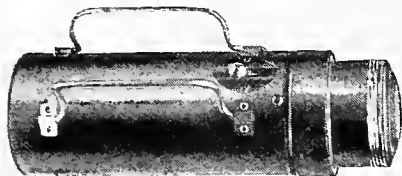
Bluemel Bros., Ltd., Wolston, near Coventry.



## Ignition Appliances and Lamps.—

### Ignition Appliances and Plugs.

An exceedingly useful electric torch has been placed on the market by Messrs. Robertsons Motors. It contains a very large battery, and gives a splendid light.



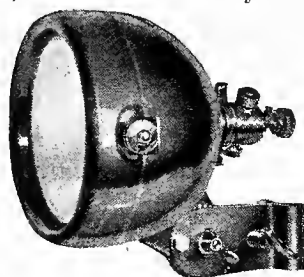
Robertson's electric torch.

It stands 8in. high, and is 2½in. in diameter. It will burn for 100 hours, and can be conveniently carried in a sidecar and used for effecting repairs by night.

Messrs. Robertsons Motors, Ltd., 157b, Great Portland Street, W.

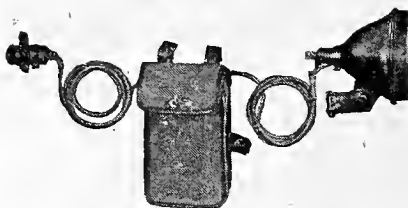
### Electric Head Lamps.

Few accessory dealers understand more clearly the wants of motor cyclists than Mr. A. H. Hunt. The larger lamp, which is plated, is an exceedingly practical head light. It is beautifully finished, and has a scientifically designed



reflector calculated to give the best possible results. It conforms exactly to the new regulations under the Defence of the Realm Act, even to the manner of the adjustment of the lamp to the bracket. Though the lamp cannot be swung in such a manner as would enable it to be used for signalling, the beam can be set so as to suit the requirements of the rider, as a small degree of movement is allowed. The bulb holder is also worthy of note, as it provides a particularly firm fixing for the wire and, at the same time, permits the bulb to be accurately focussed. The bracket is substantial and easily attached to the handle-bars. The other lamp is of somewhat smaller dimensions, moderate in price, of pleasing appearance, and very efficient. The bracket is also different from that of the lamp we have just described, since it is designed to fit upon the ordinary lamp bracket. A very similar focussing arrangement to that employed on the lamp first described has been adopted, but the wires fasten on externally, and in the centre of the back of the holder there is a switch.

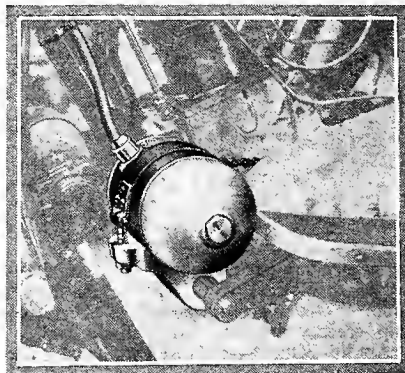
Mr. A. H. Hunt, 115, Cannon St., E.C.



Lucas dry battery lighting set, sold by Messrs. Ward and Goldstone.

### The Lucas Lighting Dynamo.

Now that electric lighting is becoming every day more popular, the Lucas dynamo is a fitting which will undoubtedly appeal to the motor cyclist with the luxurious sidecar outfit. This machine is made in two sizes, E10 and E20, both giving the same output, viz., 6 volts 5-6 amps.; the only difference being that the smaller one has to be run at a slightly greater speed. The machines are cylindrical in shape, and are made absolutely water-tight, yet all parts, such as the commutator, likely to require attention are easily accessible, being enclosed under a detachable conical-shaped cover held in place by a single large screw. The current when charging is kept practically constant by a patent electric regulator which is perfectly simple and reliable. When the dynamo is not charging there is no magnetic drag whatever, and when charging the



minimum of power is required to drive it, and it does not perceptibly influence the pulling of the engine. The famous King of the Road acetylene lamp sets for motor cycles remain unaltered.

Messrs. Joseph Lucas, Ltd., Birmingham.

### F.R.S. Lamps.

The famous F.R.S. lamps, both acetylene and electric, are sold in numerous different shapes and sizes suitable for practically any type of cycle. The outline of these lamps is quite distinguishing, all corners being nicely rounded off, thus giving a neat appearance while at the same time rendering them easy to clean. A neat fitting on some models is a special lug for carrying the A.A. badge. The chief feature is, of course, the F.R.S. special Mangin lens fitted to all models, the perfect design of which makes it possible to use practically every available ray of light. A very neat accessory is the F.R.S. electric adapter. This is a device intended to fit over the

existing burner, by means of which it is possible instantly to convert the lamp from gas to electric. It consists of a small holder into which screws a small electric bulb and parabolic reflector. The current is supplied from a small dry accumulator carried in a leather case. Although the beam of light is penetrating, there is very little glare. An excellent dynamo outfit suitable for any machine is also made and sold at a very reasonable figure.

Messrs. F.R.S. Lamps, 7 and 9, Pershore Street, Birmingham.

### Standard Plug.

A very serviceable moderate-priced all-British plug is the Standard. The electrodes, which are made of pure nickel, form two gaps, and are very substantial. The porcelain insulator is secured in position by a brass locking nut; it is, therefore, quickly and easily detachable if at any time it becomes necessary to renew either this or any other part, all of which can be obtained at a low cost.

The Standard Accessories Co., Ltd., 66, Moor Street, Birmingham.



### Lodge Plug.

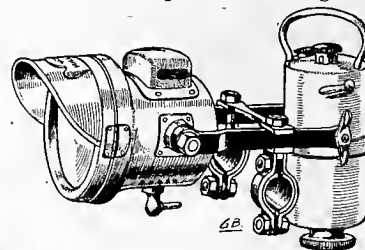
The latest design of Lodge plug is the racing model. The metal body of this new plug is grooved in order to expose a considerable surface to the air for extra cooling; the brass top is also grooved in a similar manner. The insulation is composed of mica. The points are the same as those in the special two-stroke model, viz., single gap, the side electrode being formed by a nickel plate let into the body, having a hole in the centre through which the centre electrode, also of nickel, projects, and a small protuberance on the side.

Lodge Sparking Plug Co., Ltd., Wrentham Street, Birmingham.



### Miller Lamps.

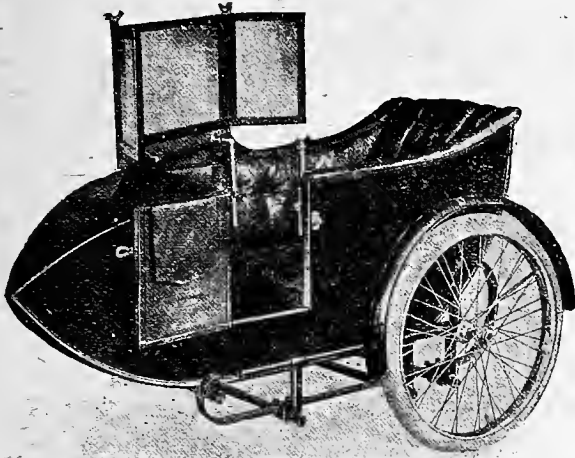
Among the large range of lamps manufactured by Messrs. Miller and Co., the No. 31H is undoubtedly a most serviceable fitting. A 4in. genuine



Mangin mirror is fitted, and the lamp is of graceful appearance. The generator and lamp are carried on the one bracket, so that the weight of the lamp balances the weight of the generator. This is carried on a girder type bracket clipped by two clips on the top of the handle-bar.

Messrs. Miller and Co., Miller Street, Birmingham.

# DUNHILLS PATENT TRIPLE WINDSCREEN.



In Polished Walnut with Nickel Fittings :

Price complete with side wings	- - -	£3 0 0
Price of Single Screen	- - -	£2 2 0

**A**N ideal windscreen—keeps the passenger always snug and cosy in the coldest weather and free from draughts.

The side wings are detachable, and the screen can be tilted to any angle. It will fit any make of car.

A twist of a wing nut is sufficient to release the catch and let the screen swing across and allow the passenger to alight.

**Dunhills** LTD.,  
359-361, EUSTON RD., LONDON, N.W.  
— 42-43, LOMBARD STREET, E.C. —

MANCHESTER :  
50-92, Cross Street.

GLASGOW :  
72, Vincent Street.

# BINKS CARBURETTORS ON 2-STROKES

These grand little machines are wonderfully improved by fitting a Binks, it makes them **run slower without 4-stroking**, start easier, and makes them tick over when in free, and greatly increases the mileage per gallon.

Winner of the much coveted Manufacturers' Trophy (by Mr. Robbins), and used by Mr. O'Donovan on his wonderful record-breaking feats.

## WHY NOT AT ONCE IMPROVE YOUR MACHINE?

I send on approval for 4 weeks' trial and return your money, less examination fee, if you are not delighted with it.

### TESTIMONIALS EVERY DAY.

"I have fitted the Carburetter, and I find it does on my Allon 2-stroke, 40 more miles to the gallon than the carburetter sent out with the machine."

"I can now run at just half the speed without any 4-stroking. I am thoroughly satisfied."

"I have now got the jets right, and on my Calthorpe can do 115 miles to the gallon, and the power is marvellous."

"My machine is quite another thing since I fitted the Binks. Very little 4-stroking, 120 miles to the gallon, and terrific power."

And so on, and I can show you the originals at my works.

## MY TREATISE ON CARBURATION AND LIST FREE TO EVERYONE.

PRICE  
**49/-**

Plus 10%

With  
Spare Jets and  
full  
instructions.

Makes the Scott, Douglas, or Enfield run dead slow — like a steam engine.

Makes big twins possible, and American machines a delight to their owners.

G.  
**BINKS,**  
LTD.,  
**ECCLES.**



# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.**, and crossed **& Co.**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20 Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pay carriage one way. For all transactions exceeding 10 in value, a deposit fee of 2s. 6d. is charged, when under 10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### Advance.

**ADVANCE**, 3 1/2 h.p., 1912, good running order and condition, Bosch., B. and B.; bargain, £10.—Dunn, Sunningdale, Berks. [9004]

### A.J.S.

**A.J.S.**, 1916, 2 1/2 h.p.; £58.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

**A.J.S.**, 1916, 4 h.p., in stock; £76.—Williams, Chapel Ash Depot, Wolverhampton. [X0193]

**1915 1/2 h.p. A.J.S.**, lamp, horn, spares, as new.—Hussey, Vine St., Stafford. [9048]

**1916 2 1/2 h.p. A.J.S.** in stock; £55; 4 h.p. A.J.S., £76.—Cross, Agincourt, Litherham. [X0152]

**A.J.S.** 1916 6 h.p. Combination, and 2 1/2 h.p. 3-speed models in stock.—Moss, Wem. [X0172]

**1915 6 h.p. A.J.S.** Combination, lamp, horn, rear lamp, excellent condition; £82.—Palfreeman, Plealey, Mansfield. [X0185]

**A.J.S.**, 1914, 2 1/2 h.p., 2-speed, clutch, kick starter, a trip speedometer, lamp, horn, splendid condition; £45.—Moore, 50, Ramshill Rd., Scarborough. [8795]

**5 h.p. A.J.S.**, countershaft gear box, chain drive, kick starter, complete with Canelet sidecar, beautiful condition throughout; any trial; sacrifice £45.—Pike, Derwent Mill, Matlock. [X0091]

**YOU SAVE YOUR TIME  
IF YOU GO FIRST TO**

**WAUCHOPE'S**  
WHERE THE BARGAINS  
SAVE YOUR MONEY.

THESE ARE SELECTIONS FROM  
OUR TO-DAY'S BARGAIN LIST.

## Second-hand Machines in Stock.

No.	h.p.		
10145.	2 1/2	1915 2-sp. <b>ALLON</b> .....	£32 10
10150.	3 1/2	1914 3-sp. <b>NUT-J.A.P.</b> and Sc. ....	£42 10
10161.	4	1914 3-sp. <b>TRIUMPH</b> .....	£40 0
10162.	2 1/2	1914 2-sp. <b>CONNAUGHT</b> & Sc. ....	£32 10
10163.	2	1914 2-sp. <b>CALTHORPE</b> .....	£17 10
10164.	3 1/2	1912 <b>ZENITH</b> and Sidecar .....	£25 0
10165.	4	2-sp. <b>SINGER</b> , 1914 model .....	£32 10
10166.	4 1/2	1916 chain-cum-belt <b>B.S.A.</b> , T.T. model .....	£55 0
10172.	10	1914 2-sp. <b>HENDERSON</b> & Sc. ....	£55 0
10177.	6	1912 <b>ZENITH</b> and Sidecar .....	£35 0
10126.	5-6	1914 <b>RUDGE</b> Multi and Sidecar .....	£45 0
10123.	3	1915 2-sp. <b>ROYAL ENFIELD</b> .....	£42 10
10120.	3 1/2	1914 <b>RUDGE</b> Multi .....	£35 0
10117.	3 1/2	1911 <b>F.E. TRIUMPH</b> .....	£27 10
10094.	2 1/2	1915 <b>LEVIS</b> .....	£22 10
10093.	3 1/2	1913 3-sp. <b>ROVER</b> Combination .....	£42 0
10092.	3 1/2	1911 2-sp. <b>N.S.U.</b> .....	£20 0
10091.	2	1912 <b>CENTAUR</b> .....	£15 0
10085.	10	1913 2-sp. <b>HENDERSON</b> & Sc. ....	£55 0
10076.	4 1/2	1915 3-sp. <b>B.S.A.</b> Combination .....	£65 0
10075.	6	<b>BEDELIA</b> Cycle Car .....	£25 0
10068.	3 1/2	1912 <b>QUADRANT</b> , vari. gear .....	£20 0
10059.	2	1915 2-sp. <b>CALTHORPE-J.A.P.</b> .....	£27 10
10043.	2 1/2	1914 <b>ALLDAYS</b> , 2-stroke .....	£17 10
10042.	2	1915 3-sp. <b>DOUGLAS</b> , Model U .....	£50 0
10021.	3	1912 <b>SWIFT</b> .....	£20 0
10014.	7	1914 2-sp. <b>HENDEE</b> Special and Sidecar .....	£55 0
9995.	4-5	1913 3-sp. <b>HAZLEWOOD</b> & Sc. ....	£37 10
9974.	2 1/2	1915 2-sp. <b>DOUGLAS</b> .....	£45 0
9953.	2 1/2	1915 2-sp. 2-stroke <b>TYLER</b> .....	£27 10
9946.	2	1914 3-sp. <b>T.T. FORWARD</b> .....	£29 0
9935.	3 1/2	1915 3-sp. <b>SUNBEAM</b> .....	£67 10
9931.	6	1914 3-sp. <b>A.J.S.</b> and Sidecar .....	£73 10
9896.	3	1913 2-sp. <b>twin ENFIELD</b> .....	£35 0
9867.	2 1/2	1911 2-sp. <b>ENFIELD</b> .....	£26 0
9853.	6	1914 2-sp. <b>ENFIELD</b> Combin .....	£60 0
9839.	3 1/2	1907 <b>TRIUMPH</b> and Sidecar .....	£22 10
9772.	3 1/2	1914 water-c. 3-sp. <b>HUMBER</b> .....	£35 0
9767.	5	1908 2-sp. <b>REX</b> and Sidecar .....	£27 10
9746.	6	1914 3-sp. <b>NEW HUDSON</b> & Sc. ....	£60 0
9076.	5	1907 <b>F.F. ROC</b> .....	£20 0
8896.	5-6	1912 4-cyl. <b>F.N.</b> and Sidecar .....	£45 0
8832.	1 1/2	1909 <b>MOTOSAGOCHE</b> .....	£9 0
8718.	3	2-sp. <b>FAFNIR</b> and Sidecar .....	£22 10
8682.	6	1913 2-sp. <b>V.S.-J.A.P.</b> .....	£40 0
8175.	6	1913 2-sp. <b>N.S.U.</b> .....	£45 0
7992.	3 1/2	2-sp. <b>FAFNIR</b> and coachbuilt Sidecar .....	£22 10
7521.	5-6	1911 4-cyl. <b>F.N.</b> .....	£20 0
6842.	3 1/2	1912 <b>F.E. RUDGE</b> .....	£27 10

Over 300 on offer, new and second-hand, including latest models of all best makes. Lowest prices. Easiest easy terms.

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**WAUCHOPE'S**

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LONDON, E.C.**

Phone: 5777 Holborn.

Wir: "Opifcer, London."

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**1915 6 h.p. A.J.S.** Combination, absolutely in stock, this luxurious outfit complete only costs £102/10; exchanges, easy terms.—Julian, Broad St., Reading. Phone: 1024. [X1485]

**5 h.p. A.J.S.**, 2-speed countershaft, kick start, clutch, Bramble coachbuilt, thoroughly overhauled, new Amac, etc., lamps, tools, spares; £45.—Cummins, Ast-woods, Staverton, near Cheltenham. [X0166]

**A.J.S.** 1915 Combination, 6 h.p., perfect condition, wind screen, Lucas head, rear lamps, horn, tyres and tubes unpunctured; fair spot cash offers wanted.—Griffiths, Chemist, Kidsgrove, Staffs. [X0181]

### Alldays.

**ALLONS**; immediate delivery these grand machines.—W. P. Edwards, Taunton. [X9969]

**ALLON**, 2 1/2 h.p., 2-stroke, 2 speeds, clutch, almost new; £34.—W. P. Edwards, Taunton. [X9961]

**ALLDAYS** Allon, all models: immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0763]

**FOR** Sale, perfectly new 2-speed gear Allon motor cycle, with hand-operated clutch; price £40.—Apply, Denis Best, Temple Laugharne, Worcester. [8974]

**ALLON**, 2-speed, July, 1915, very carefully used, and in excellent condition; £35, or with cash for 4-h.p., 1914 or 1915, twin (solo), clutch, etc.—W. Smith, Ledbury. [8886]

### Antoine.

**ANTOINE**, 3 1/2 h.p., free, handle start, mag., just overhauled, Clincher tyres, good running order.—J. Booth, West Stockwith, Notts. £13. [8913]

### Ariel.

**ARIEL**, 1912, 3 1/2 h.p., variable pulley, recently overhauled; £20, nearest.—Munro, 14, Palace Sq., Inverness. [X0094]

**ARIEL**, 1911, 3 1/2 h.p. motor cycle, B. and B., Bosch mag., tyres equal to new, aluminium footboards; £17/10; splendid puller.—Wright, 69, Welbeck St., Hull. [X9957]

**1914 Ariel** 5-h.p. and 3 1/2 h.p. Combinations; £93/10 and £80/7; actually in stock; deferred payments quarter down and 12 monthly instalments; exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9015]

### Arno.

**SMART** Arno Combination, 1914, 3 1/2 h.p., 3-speed, cane sidecar, well upholstered, lamp, horn, Sen spray; 38 gns.—Railway Garage, Staines. [9152]

### Auto-Wheels.

**AUTO-WHEEL**, quite new, never been used; accept £10.—F. Liddiard, Prittlewell. [X0186]

**AUTO-WHEEL**, in excellent condition, perfect order; £7/10.—L. Fearn, Altrinton, Derbys. [9111]

**AUTO-WHEEL** de Luxe, £15/15; a second-hand standard model, £10.—248, Bishopsgate, London. [9133]

**AUTO-WHEEL** de Luxe, B.S.A., not run 300 miles, perfect condition; £10.—Holt, Dalton Sq., Lancaster. [X0240]

**AUTO-WHEEL**, 14 gns. model, brand new, only shop-soiled; 12 gns.—3, The Parade, Twickenham Rd., Isleworth. [8953]

**AUTO-WHEEL** with cycle and light sidecar; 16 gns.; deferred payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9019]





## MOTOR CYCLES FOR SALE.

## Chater-Lea-Villiers.

LATE 1915 Chater-Lea-Villiers, 2½ h.p., Senspray, not done 500 miles; owner enlisted; kumps and horn, complete; £35.—Daan, Grocer, Hoo. [8948]

## Clyno.

1914 Clyno, 2-stroke, 2-speed, clutch, Lucas set, and horn, Watford trip, 3,000; bargain, £26.—5, Gamble Rd., Tooting. [8957]

1913 Clyno Combination, 3-speed, kick starter, new tyres and chains, horn, 2 lamps, splendid condition.—Hallett, Leestock Green, Hemel Hempstead. [X0188]

CLYNO, 2½ h.p., 2-stroke, 2-speed, clutch, new tyres, new Watsonian sidcar, perfect order, take two anywhere, all accessories, spares; £35, or exchange Douglas and cash.—Royal Oak, Biggleswade. [8995]

## Connaught.

CONNAUGHT Miniature in stock, immediate; exchange.—W. and H. Motor Co., Ltd., 287, Deane-gate, Manchester. [8681]

CONNAUGHT, 1915 (late), 2½ h.p., 3-speed, free engine, 2-stroke, nearly new; cost £48, sacrifice £33.—26, High St., Teddington. [8794]

CONNAUGHT 1915 Standard Model, 2-stroke, 2½ h.p., Amac carburettor, drip feed lubricator fitted, mileage under 500, excellent condition; cost £36/17, accept £26; exchanges.—Ideal Cycle Co., Thundersley, Essex. [9119]

## Diamond.

DIAMONDS, 1916, all models in stock, ready to ride away.—Birmingham Sole Agents, T. Stevens, Gooch St., Birmingham. [X0238]

DIAMOND, the little machine with a big reputation, single and 2-speed models at Colmore Depot, 211, Deansgate, Manchester. [8904]

## De Dion.

DE DION, 10-12 h.p., 4-seater, mag., new hood and curtains, screen, Stepany, excellent condition; £70; exchange good combination and cash.—Rimell, c/o 45, Pembor Rd., Kensal Green. [X0014]

## Dot.

DOTS.—All models from £38/10 to £81/18; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8588]

## Douglas.

DOUGLAS, 2½ h.p., V, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½ h.p., U, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½ h.p., W, 3-speed, clutch, in stock; £56/14.

DOUGLAS, 2½ h.p., X, lady's, kick-start, in stock; £56/14.

DOUGLAS, 2½ h.p., War Office model, in stock; £54/12.

DOUGLAS, brand new, models U, V, W, and X, in stock, with C.A.V. mag., at rock-bottom nett cash prices; trade supplied promptly; lists on application. Douglas specialists. Tel.: 388. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [6864]

NEARLY New 1915 Douglas; £48.—A. J. Young, Newmarket. [8328]

DOUGLAS, 1913, perfect order; bargain, £27.—Walbro Motor Co., Ely, Cambs. [X9953]

DOUGLAS, new War Office model, in stock; £54.—Walbro Motor Co., Ely, Cambs. [X9955]

DOUGLAS, 1916; immediate or early delivery; any model.—W. P. Edwards, Taunton. [X9965]

DOUGLAS, 1915, 2½ h.p., 3-speed, T.T., Cowey, horn; £47/10.—Hampton Rd., Beckenham. [X0163]

DOUGLAS, 1913½, 2½ h.p., 2-speed, free, T.T., perfect; £27/10.—English, Ironmonger, Newark. [X9676]

DOUGLAS, 1915, 3-speed, in fine order, speedometer, and all lamps; £42.—Sydney Hall, Stevenage. [X0157]

DOUGLAS, 1912, 2 speeds, clutch, footboards, etc., beautiful condition; £28.—27, Friday Rd., Epsom. [9110]

DOUGLAS, 1914, 2½ h.p., 2-speed, usual accessories, fine order; £36.—77, High St., St. John's Wood. [9007]

1915 T.T. Douglas, Oct. lamps, Lucas horn; £45.—11, Conway Grove, Woodborough Rd., Nottingham. [X0178]

1914 Douglas, Colonial model, all accessories, splendid condition; £38.—Earl, 5, Heath St., Hampstead. [X0130]

1914 2½ h.p. T.T. Douglas, splendid order, lamp, complete; £35.—Bryden, Wellington Rd., Leeds. [9066]

DOUGLAS, 2½ h.p., late 1914, 2 speeds, clutch, kick starter, equal new; £38.—10, Norwood Crescent, Southport. [X0146]

2½ h.p. Douglas, 2-speed, and clutch model, excellent condition, done 5,000 miles; £37/10.—Pythian Garage, Banbury. [8894]

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## LIST OF EX-STOCK BARGAINS.

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## 1916 MODELS.

ALLDAYS-ALLON, single speed	£34 0
ALLDAYS-ALLON, 2½ h.p., 2-speed	£42 0
ALLDAYS-ALLON, 2 sp. and clutch	£45 0
SUN-VILLIERS, 2½ h.p., single-speed	£29 10
SUN-VILLIERS, 2½ h.p., 2-speed	£35 10
JAMES, 2½ h.p., 2-speed	£38 11
NEW RYDER, 2½ h.p., single-speed	£28 13
NEW RYDER, 2½ h.p., 2-sp. J.A.P.	£33 12
ZENITH, 4½ h.p., countershaft	£73 16
B.S.A., 4½ h.p., 3-sp., all chain	£64 0
B.S.A., 4½ h.p., ditto, chain-cum-belt	£62 0
ALLDAYS-MATCHLESS 2½ h.p.	£22 10
INDIAN, 5 h.p., 3 speeds, Model B	£70 0
INDIAN, 7 h.p., 3 speeds, Model C	£78 0
ENFIELD, 3 h.p., 2-speed, T.T.	£52 10
ENFIELD, 6 h.p., Combination	£69 5
LEVIS 2 h.p., Popular model	£23 1
MORGAN 8 h.p. de Luxe, water-cooled	£117 18
CALTHORPE 10 h.p. Light Car Coupe, dynamo lighting, Royal blue	£246 0

## 1915 MODELS

## AT REDUCED PRICES.

ROYAL RUBY, 2½ h.p., 2-str., 2-sp.	£38 10
ROYAL RUBY, 2½ h.p., ditto, single-sp	£29 10
ROYAL RUBY, 2½ h.p. J.A.P., single-sp	£32 10
ROYAL RUBY, 2½ h.p. J.A.P., 2-speed	£39 10
BLACKBURN, 3½ h.p., 3-sp. c-shaft	£67 9
J.H., 6 h.p., 3-speed, countershaft	£73 10

7½% cash discount on all above.

## SECOND-HAND BARGAINS.

## SIDECAR OUTFITS

REX, 1914, 8 h.p., Spacke engine, 3-speed	£48
REX, 1914, 6 h.p., hood and screen	£46
REX, 1914, 6 h.p., 3-speed, coach Sidecar	£50
TRIUMPH, 1911, 3½ h.p., clutch, and S'car	£22
MATCHLESS, 1914, 8B, M.A.G., 3 speeds	£75
ZENITH, 1914, 8 h.p., clutch, Milliford	£68
BAT, 1913, 6 h.p., 3 speeds and Sidecar	£52
V.5-J.A.P., 1913, 8 h.p., 2-speed, Sidecar	£32
MOTOSACOCHE, 6 h.p., 1915, sporting Sc.	£65

## SOLO MOUNTS.

REX, 1909, 3½ h.p., 3-speed, handle start	£21
ENFIELD, 1915, 3 h.p., T.T., 2 speeds	£42
BLACKBURN, 1914, 3½ h.p., 3 speeds	£50
INDIAN, 1914, 7 h.p., T.T., clutch	£42
F.N., 1912, 2½ h.p., 2-sp., shaft drive	£17
P. & M., 1914, 3½ h.p., 2 speeds, little used	£58
INDIAN, 1914, 7 h.p., electric equip., 2-sp.	£46
P. & M., 1913, 3½ h.p., 2-sp., handle start	£40
VELOCETTE, 1915, 2½ h.p., 2-sp., 2-stroke	£32
ZENITH, 1913, 3½ h.p., clutch	£38
DIAMOND, 1914, 2½ h.p., 2 speeds	£19
CALTHORPE, 1914, 2 h.p., 2 speeds	£19
ALLDAYS-ALLON, 1915, 2-str., 2-speed	£34
DOUGLAS, 1914, 2½ h.p., T.T.	£20
CALTHORPE-J.A.P., 1915, 2½ h.p., 2-sp.	£22
KERRY-ABINGDON, 1910, 3½ h.p., 2-sp.	£22
TRIUMPH, 1914, 4 h.p., T.T. and clutch	£26
ALLDAYS, 1914, 2-sp., 2-stroke	£10
MOTO-REVE, 2 h.p., magneto, twin	£10
MOTOSACOCHE, 2½ h.p., mag., late model	£14

## LIGHT CARS, &amp;c.

STANDARD 1914 9.5 h.p. Light Car, all equipment	£188
MORGAN 1913 8 h.p. Grand Prix No. 1	£87

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100 and 136, Gt. Portland Street,

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## MOTOR CYCLES FOR SALE.

## Douglas.

DOUGLAS, 1914, run 400 miles, as new, 2-speed, clutch, lamps, etc.; £38/10.—11, Luna Rd., Thornton Heath. [9002]

DOUGLAS, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas.—Moffat, Yeovil. Tel.: 50. [9203]

DOUGLAS, 1913, clutch, kick starter, 2-speed, footboards, good condition; £35, or exchange.—Standing, Ashford, Middlesex. [8891]

DOUGLAS.—Immediate delivery from stock; not agents only, but Douglas experts and specialists.—Gibb, Gough, Gloucester. [X3538]

SHOP-SOILED Douglas, War Office model; offers wanted, with or without Spur sidcar.—Grose, 8, New Bridge St., Ludgate Circus. [8879]

2½ h.p. Douglas, very nice condition, Miller lamp set, 4 tools, horn, and well equipped; nearest 17 gns. secures.—30, Park Av., East Ham. [X9998]

4 h.p. 3-speed 1915 Douglas, only run 1,500 miles, speedometer, lamp, horn, complete, guaranteed; £55.—Brook Motor Cycles, Burnham, Som. [8377]

DOUGLAS, 2½ h.p., splendid order throughout, engine and mag. just overhauled, new tyre and belt; sacrifice £16/10.—Speechley, 45, Church Rd., Acton. [X0219]

2½ h.p. 1913 Douglas, fixed gear, footboards, tyres, 2 belt, new lamp, horn, splendid order; Buif sed; £26; any trial.—G. H. Baldwin, Winchfield, Hants. [8901]

1915 Douglas, 2½ h.p., Colonial model, V, practically new, Watford speedometer, Lucas King's Own lighting set, spare tyre and belt; £45.—Silver Motors, Llandudno. [X0009]

3½ h.p. 1914 Douglas, spare belt, F.R.S. big head, 32 electric tail lamps, Anac, Bosch, tyres good, clutch; going abroad; £37/10, offers.—Lt. Williams, R.E., Brightingsea. [X0017]

DOUGLAS, 1913, 2 speeds, kick starter, £34; 1914, 2 speeds, T.T., very fast, £37; 1915, 2 speeds, kick starter, almost new, £44.—Percy and Co., 587, Euston Rd., London. [9082]

DOUGLAS, Douglas, Douglas.—Write us your requirements. We can supply all latest models to be had.—Alexander's, Scottish wholesale and retail agents, 115, Lothian Rd., Edinburgh. [8254]

1915 T.T. Model V Douglas, 2-speed, Hutchinson tyres, Lucas lamp, rear lamp, horn, tools, etc., condition guaranteed perfect; £43.—Robinson's, Garage, Green St., Cambridge. [0613]

2½ h.p. Douglas, 1913, 2-speed, clutch, kick start, speedometer, horn, lamps, and spares; £35, or exchange with cash for 1915-16 4 h.p. Douglas; 3-speed, kick start, clutch.—Prince, Weyhill Rd., Audover. [6912]

DOUGLAS, models U and W, actually in stock; also 1913 2-speed, kick starter, all accessories, 35 gns.; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9044]

DOUGLAS, 1914-15, 3½ h.p., 2-speed, clutch, semi T.T., 7 gns. electrical equipment, small mileage, splendid order, engineer owned; £46; seen by appointment.—Vesnar, Elm Lodge, Queen's Rd., Teddington. [X0042]

1914 Douglas, 2½ h.p., 2-speed, clutch, kick starter, Stewart speedometer, new tyre Dunlop front, John Bull back, lamps, tools, etc., splendid condition; owner ordered abroad; £36.—White Bros., 78a, Junction Rd., Upper Holloway, N. [8971]

DOUGLAS Model U, £50/8; Douglas Model V, £50/8; War Office Model, £54/12; Douglas Model W, £56/14; Douglas Model X, £56/14.—Above models actually in stock at Sole Wholesale and Retail Midland Distributing Agents, Colmore Depot, 51, Colmore Row, Birmingham. [X2344]

1910 Douglas, 2-speed gear, thoroughly overhauled, in perfect running order. We are offering this machine at the ridiculously low price of 17 gns. to clear. It is without doubt the cheapest Douglas in England to-day.—Julian, Broad St., Reading. Biggest motor cycle and light car dealer in the South. 45 years' reputation. [X9628]

## Dreng.

DRENG Lightweight Motor Cycles, 27 gns.; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8589]

## Enfield

ROYAL Enfields, 1915, second-hand 6 h.p. combinations, from £70; trial run.—Below.

ROYAL Enfields, new 1916 combinations; £89/5, in stock; exchanges; beginners taught free.—Below.

ROYAL Enfields.—For Woolwich, Plumstead, Greenwich, Blackheath, Charlton, North Woolwich, and Silvertown, sole district agent. W. Hill, 20, High St., Woolwich. [X9387]

ENFIELD 3 h.p. Twin, 1916, all accessories, as new; £47/10.—47, Hamilton Rd., Reading. [9000]

1913 Enfield Combination, lamp, horn, sidcar, hood, done 5,000; £46.—4, Thornton St., Kempston, Bedford. [9097]

1916 Model 180 6 h.p. Royal Enfield Sidecar Combination, actually in stock; 85 gns.—Alfred Proctor, Chesham. [X0139]

# Halifax Motor Exchange

68, HORTON ST., HALIFAX.

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## NEW 1916 MODELS.

LEVIS, 2½ h.p., 2-stroke .....	£32 0
LEVIS, 2½ h.p., 2-speed .....	£47 10
SUNBEAM, 3½ h.p., 3-speed .....	£73 10
SUNBEAM, 8 h.p., 3-speed .....	£94 10
EXCELSIOR (American), 7 h.p., 3 speeds ..	£75 0
CALTHORPE Minor Sporting 2-seater ....	236 gns.
MORGAN, M.A.G. engine, and accessories ..	£113 13
MORGAN de Luxe and accessories .....	£117 18
NEW IMPERIAL, 2½ h.p., 2-speed .....	£36 15
NEW IMPERIAL, 2½ h.p., variable magneto ..	£37 18
OVERLAND Touring Car, electric starter ..	£275 0
DOUGLAS MODELS.—Orders booked now.	

## EXCELSIOR.

1916, 7 h.p., twin, 84x89, mechanical and hand lubrication, kick starter, high-tension magneto, spring forks, 2-gallon petrol capacity, 3-speed countershaft gear, multiple-disc clutch with band and foot control, handle-bar control, spring seat-pillar, 3in. non-skid tyre, finish Excelsior grey; latest 1916 model, £75.

We are sole Yorkshire distributors. Liberal terms to trade.

## NEW 1915 MODELS.

*CONNAUGHT, 2½ h.p., 2-speed .....	£41 16
*WOLF-J.A.P., 2½ h.p., 2-speed .....	£37 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke ..	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed .....	£39 10
*ROYAL RUBY, 6 h.p., 3-speed .....	£87 0
DOUGLAS, 2½ h.p. V., just delivered .....	£50 8
EXCELSIOR, 7 h.p., dynamo lighting, etc. ..	£71 10

\* Cash offers wanted.

## PERFECTION SIDECARS

to suit American Excelsior and Harley-Davidson machines, 28 x 3 Dunlop tyre, grey coach-built body and chassis .....

1914 3½ h.p. 3-speed ARNO .....	£29 10
1913 3½ h.p. ROVER, 3 speeds .....	£37 10
1913 3½ h.p. ROVER, Grado gear .....	£27 10
1912 3½ h.p. ZENITH-GRADUA .....	£26 10
1912 3½ h.p. 2-speed F.B. BRADBURY .....	£29 10
N.S.U., 3½ h.p., 2-speed, spring forks .....	£18 10
EXCELSIOR, 3½ h.p., 3-speed, Druid .....	£19 19
2½ h.p. 2-speed DOUGLAS .....	£24 10
8 h.p. 3-speed CHATER-LEA .....	£33 10
1910 3½ h.p. Tourist TRIUMPH .....	£22 10
KERRY, 3 h.p., magneto, Saxon forks .....	£12 10
5½ h.p. Magneto REX, spring forks .....	£12 10
N.S.U., Twin, 2-speed, spring forks .....	£15 10
REX, 3½ h.p., magneto, spring forks .....	£14 10
DOUGLAS, 2½ h.p., twin, spring forks .....	£16 10
TRIUMPH, 3 h.p., magneto, spring forks .....	£14 10
MINERVA, 3½ h.p., magneto, variable gear ..	£13 10

## £145 RITZ LIGHT CAR. £145

The last word in light car values; 10 h.p. 4-cylinder, mechanical lubrication, electric horn and lighting, hood, screen, tools; luxuriously sprung, and a grand top gear car. Deliveries from stock. Trial runs by appointment. Exchange liberally catered for.

## SIDECAR COMBINATIONS.

Brand new 1914-15 6 h.p. REX Sidette ...	£69 10
1914 6 h.p. REX Sidette, almost as new ...	£57 10
W.C. WILLIAMSON and Sidcar (new) .....	£89 15
1913 6 h.p. 2-speed F.E. REX, chain drive, smart coach Sidcar .....	£43 10
ROVER, 3½ h.p., 3-speed Combination .....	£43 10
1912 6 h.p. REX 2-speed and Sidcar .....	£34 10
1911 3½ h.p. N.S.U., 2 speeds and Sidcar .....	£19 19
1910 3½ h.p. 2-speed REX and Sidcar .....	£24 10
6 h.p. 2-speed V.S. and Sidcar .....	£23 10

## MISCELLANEOUS.

WILLIAMSON 3-speed Cy-cl-a (new) .....	£126 0
MORGAN, 1914, sporting, hood, screen, etc. ..	£82 10
PREMIER 7-h.p. 2-seater Car .....	£67 10
Cycle Car Front and Rear Axles and Wheels ..	£2 15
New Upholstered Sidcar Bodies .....	12/6, 13/6
Triumph Pattern Horns .....	5/9, 6/9
1915 Rex Coach Sidcar, brand new .....	£12 10
New Mechanical Horns. Special reduced price ..	15/11
Triumph Pattern Horns (new) .....	5/11

## MOTOR CYCLES FOR SALE.

### Enfield.

ENFIELD 40 gn. 2-speed 2-stroke, been ridden 10 miles, for 35 gns., carriage paid.—Pitts, Motor Stores, Redditch. [X0273]

ENFIELD, 1915 (late), 3h.p., twin, done under 1,000, horn, Miller lamp; seen by appointment; £44.—Strong, Magor, Mon. [X9667]

ENFIELD Combination, late 1914, 2 Lucas lamps and horn, all accessories; £60.—Browning, 68, Gt. Percy St., King's Cross. [9134]

ENFIELD 6h.p. 1916 Combinations, delivery from stock; price £89/5, or deferred payments.—Layton's Garage, Bicester, Oxon. [X0228]

ENFIELD Combination, 6h.p., condition as new, complete with mudshield, lamp, horn, and spares; 70 gns.—Horsley, Wheelgate, Malton. [X0110]

1915 Enfield, 3h.p., 2-speed, model 140, new, but slightly shop-soiled; list price £52/10, going at £43.—Alexander's, 115, Lothian Rd., Edinburgh. [8255]

ROYAL Enfield, 2½h.p., 1911, twin, chain driven, just overhauled, new Dunlops, splendid running order; £20.—W. A. Stephen, Hyer Hall, Barnet. [X0048]

BARGAIN.—As new, 1916 3h.p. Enfield, only done 100 miles; owner enlisting; best offer over £48 secures.—Parker, Ilstree, Portsmouth Rd., Esher. [8882]

1912 6h.p. Enfield, special wide coachbuilt sidecar to seat 2, accessories, etc.; £45, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0722]

ENFIELD, 1912, 3h.p., 2-speed, fast little bike, engine just overhauled, tyres practically new, all in good order; £18.—Walbro Motor Co., Ely, Cambs. [X9954]

1915 6h.p. Enfield Combination, new in November, used 20 miles only; cost £92, accept £75/10; owner enlisted.—Alexander's, 115, Lothian Rd., Edinburgh. [8979]

1915 15% Enfield, 3h.p. twin, kick start, gears, tyres as new, lamp, horn, only very little used; property of officer on service; £45; must sell.—G. H. Baldwin, Winchfield, Hants. [8900]

ENFIELD, late 1915, 3h.p. M.A.G. engine, 2 speeds, latest type, complete with large Lucas horn and lamp set; cost £56, accept £41 for quick sale.—Apply, Nye, de Ronco, Ltd., Grey St., Newcastle-on-Tyne. [8966]

1915-1916 6h.p. Enfield Combination, lamp, generator, and horn, only used 3 times, bought in November, costing £92, would pass for new; owner enlisted; £74.—Alexander and Co., 115, Lothian Rd., Edinburgh. [8253]

ENFIELDS, actually in stock: Standard 6h.p. combination, 35 gns., hood and screen £5 extra; also De Luxe model, electrical equipped, 100 gns. Your old Enfield taken in part exchange; easy deferred payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9009]

### Excelsior.

1915 American Excelsior, 7h.p. 3-speed, only used 200 miles, and as new; £55.—Alexander's, 115, Lothian Rd., Edinburgh. [8984]

AMERICAN Excelsior, 1914, 7h.p. 2 speeds, with coachbuilt sidecar, speedometer, horn; £44.—Ade- laide Motor Co., 84, Chalk Farm Rd., N.W. [8997]

1916 Excelsior (British), 8h.p. J.A.P., Jardine 3-speed gear, Mills-Fulford Empress sidecar, Lucas dynamo lighting set; £112, complete.—Below.

1916 Excelsior (British), 2-stroke; £30/16.—W. Brandish, the Triumph Garage, Foleshill Rd., Coventry. [X8949]

EXCELSIOR (American), 7.9h.p., 3-speed model, quite new; usual price £75, accept £58, or deferred payments.—Layton's Garage, Bicester, Oxon. [X0229]

AMERICAN Excelsior, 1916 models, £75, De Luxe £85; immediate delivery. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8597]

### Fafnir.

FAFNIR, 3½h.p., 1911, new Chater frame, Druid forks; £20; exchange screw-cutting lathe. £60, Boundary Rd., Walthamstow. [9101]

### F.N.

F.N., 5-h.p., 4-cyl., 1911, drip feed, in splendid condition; £15; exchange lathe.—101, Boundary Rd., Leyton. [9102]

2½ h.p. F.N., mag., 3 speeds, in perfect order; first 24 cheque secures £15.—Percy and Co., 337, Euston Rd., London. [9088]

F.N., 1913, 4-cyl., mechanically perfect, coachbuilt sidecar, turnout cost £80, what offers?—Strachan, Butchers, Banbury. [X0119]

F.N., 2½h.p., running order, B. and B. new mag., good tyres and tubes; offers.—Apply, Castell, Queen St., Stradbroke, Eye, Suffolk. [8966]

### Harley-Davidson.

HARLEY-DAVIDSONS in Stock.—Premier Motor Co., Birmingham.

MODEL 11J, with dynamo electric lighting; £76/13, duty free.—Premier Motor Co., Birmingham. [8684]

## CASH, EXCHANGE, or EASY PAYMENTS.

The following are actually in stock.

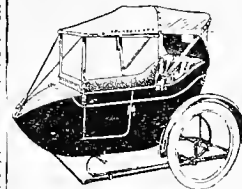
1916 4½ h.p. B.S.A., 3-speed, Model K	£62 0
1916 Grand Prix MORGAN, No. 1, speedometer, etc. ....	£120 0
1916 SPORTING MORGAN, all on	£109 0
1916 6 h.p. NEW HUDSON ....	72 gns.
1916 FORD Touring Car, 20 h.p.	£135 0
1916 FORD Chassis, 20 h.p. ....	£115 0
1916 FORD Van, 20 h.p. ....	£130 0
1916 20 h.p. FORD Ambulance	£135 0
1916 6 h.p. ENFIELD Combination	85 gns.
1916 6 h.p. J.H. Combination ....	90 gns.
1916 5-6 h.p. EXCELSIOR, Sturmeay countershaft 3-speed gear ..	68 gns.
1916 4½ h.p. EXCELSIOR, Sturmeay countershaft 3-speed gear ..	64 gns.
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on ....	£120 0

## SECOND-HAND BARGAINS.

1915 3 h.p. ENFIELD, 2-sp., kick starter, very smart, all accessories, original tyres, unmarked .....	£39 0
1915 2-sp. 2-str. NEW HUDSON, done 500	28 gns.
1915 B.S.A. Combination, all chain drive ..	£63 0
3½ h.p. 1900 REX de Luxe, 2-sp., handle stg	£19 0
6 h.p. ZENITH, clutch model and Sidecar ..	£40 0

## FARLOW SIDECARS.

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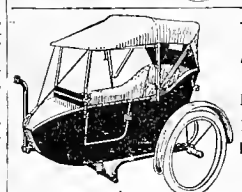
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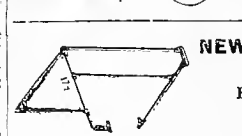
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**HARLEY-DAVIDSON**, 1915, 7-9 h.p., T.T. bars, hand and foot controlled clutch, single speed, fast, excellent condition. £50.—Lieut. Churchman, Bell Hotel, Saxmundham. [9132]

**HARLEY-DAVIDSON**, nearly new, 11J model, 3-speed, electric light, speedometer, spare tyre, Coronet sidecar; special bargain, £70.—Larkhill Garage, Larkhill Camp, Salisbury. [8914]

**HARLEY-DAVIDSON**, 7-9 h.p., June, 1914, small mileage, owner on service, perfect condition, coachbuilt sidecar; £55.—Captain Gordon Playter, Bhimpore Barracks, Tidworth, Hants. [X0121]

**HARLEY-DAVIDSON**, 11J, with Millford Empress special sidecar, turnout as new, tyres unpunctured, mileage does not exceed 500; £78.—Colmore Depot, 31, Colmore Row, Birmingham. [X0018]

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**1915 Henderson**, 4-cyl., 10 h.p., and £20 sidecar, shop-soiled only: will accept £85 to clear.—Alexander's, 115, Lothian Rd., Edinburgh. [8986]

**HENDERSON** and large Coachbuilt Sidecar, 8-10 h.p., 4-cyl., 2-speed, clutch, speedometer and spares, only run 2,000 miles, condition and appearance as new: £70.—Westbrook, 37, Priory Rd., Kew Gardens. [9062]

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**HOBART**, 24 h.p., Villiers engine, latest model, only ridden about 2 months, splendid condition; a bargain.—Knight, 4, Seymour Rd., Hampton Wick. [8881]

**HOBART**, 1915 August, 2-stroke, 2-speed, 24 h.p. Villiers engine, lamp, etc., complete, like new: £30.—2nd Lt. Pitts, Ivy Bush Royal Hotel, Carnarvon. [8975]

## Humber.

**HUMBER**, 3 1/2 h.p., good condition: £7.—3, The Parade, Trickenham Rd., Isleworth. [8954]

**ALMOST NEW Water-cooled 3 1/2 h.p. Humber**; a trial: £50.—A. J. Young, Newmarket. [8327]

**HUMBER**, 3 1/2 h.p., 2 speeds, coachbuilt sidecar, in tip-top order and condition: £25.—Percy and Co., 337, Euston Rd., London. [9085]

**1913 3 1/2 h.p. Humber**, 3-speed, and Canoelet sidecar; £40, or exchange for higher powered outfit.—J. Bartlett, Woodhouse, And ver. [X9665]

**HUMBER**, 3 1/2 h.p., late 1911, 2 speeds, 1914 Water-cooled sidecar, excellent condition, used week-ends only: £26.—Mascott, Llandrindod Wells. [X0195]

**3 1/2 h.p. 1914 Humber**, 3-speed, torpedo sidecar, all accessories: £50; cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0724]

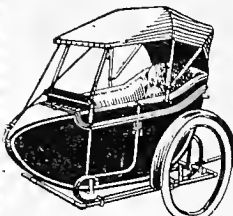
**2 1/2 h.p. Twin Humber**, 1913 1/2, 3-speed and clutch, grand condition, very fast: £27, or nearest offer, or consider exchange for 3 1/2 h.p.—G. Williams, 6, Gwendolene Av., Upton Park, E. [9001]

**1914 3 1/2 h.p. Humber**, 3-speed, new tyres, tubes, and built speedometer, lamps, horn, engine and gears just overhauled, whole condition equal to new: £40, also £16/14 1914 Bramble sidecar, £10.—Fairlie, Tisbury, Wilts. [8926]

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**1915 3 1/2 h.p. Indian**, 3-speed, kick starter, T.T. bars, tyres perfect, not ridden 500 miles; cost £65, accept 48 gns.—B. Carroll, Thorndene, Lytham. [8962]

**INDIAN**, 1915 (July), 5 h.p., 3-speed, unpunctured, dynamo, C.A.V. head light, tail light, horn, fast; bargain, £45.—Lt. Williams, R.E., Brightlingsea. [X0016]

**1915 Indian 7 h.p. Road Racer**, model D, free engine, clutch, hand-operated, speedometer, lamp, generator, horn, complete; £38.—Crisswell's Garage, Newmarket. [X0183]

**INDIAN**, 1916 model B, 5 h.p., not a month old, 3 speeds, kick starter, lamps, horn, perfect condition; £60; officer ordered abroad; quite genuine.—Wigg, 31, Bow St., London, W.C. [9136]

**5 h.p. Indian**, 1915, mechanically perfect, very fast, Dunlop tyres little wear, 3-speeds, clutch, P. and H. lamps, speedometer; £55.—King and Harper's Garage, Bridge St., Cambridge. [X0126]

**INDIAN**, red, 7-9 h.p., 1913, Millford coachbuilt sidecar, speedometer, lamps, tools, recently overhauled, excellent running order; owner in France; price £50.—Cooper, 86, Woodstock Rd., Oxford. [X0102]

**1915 5 h.p. Indian**, 3-speed, engine thoroughly overhauled, Kempshall tyres, front tyre good; 40 gns.—Julian, Broad St., Reading. Biggest motor cycle and light car dealer in the South. Phone: 1024. [X0263]

**1915 1/2 Indian**, 5-6 h.p., 3-speed, Millford sidecar, lamps, horn, tools, not done 700 miles, perfect condition; £65; will ride 50 miles.—Lieut. Stileman, 9th Berks, Bovington Camp, Wool, near Bournemouth. [9030]

**1915 Model C 7 h.p. Indian**, 3-speed, new, slightly shop-soiled; list price £78, going now at £68/10, complete electric equipment and speedometer; don't miss this chance.—Alexander's, 115, Lothian Rd., Edinburgh. [8256]

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**INDIANS**.—All models from £49/10 to £90; early delivery. No connection with any adjoining concern whatsoever. Office hours 8 a.m. to 6 p.m. Closed dinner hours.—Messrs. Green Taxis, Villiers St. Garage, Claring Cross, London. [8600]

**INDIAN**, 1914, 7-9 h.p., Millford coachbuilt sidecar, fitted with hood, screen, luggage grid, pair electric head lamps, tail lamp, Binks and Indian carburetter, all accessories, condition like new; any severe trial given: 64 gns.—265, High St., Sheerness. [8908]

**INDIAN**, model B, £70, Power Plus G £75, Power Plus F £90, electric model, all in stock; also 1915 model B, semi-T.T. 3-speed, only 2 months old, 55 gns.; exchanges, liberal deferred payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9011]

## Ivy

**IVY** 1914 2-stroke, little used and as new, lamp, horn; £24/10.—Layton's Garage, Bicester, Oxon. [X0230]

**1913 3 1/2 h.p. Ivy** Precision Motor Cycle and sidecar, 3 speeds, Bosch mag., B.B. carburetter, lamps, tools, bags: £30.—12, Blackhorse Lane, Walthamstow. [X0099]

## Ixon.

**IXION**, special show finish, in stock; immediate.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [8660]

## James.

**1913 4 1/2 h.p. James** and Canoelet sidecar, complete, lamps, etc.; £41.—Cross, Jeweller, Rotherham. [X0150]

**JAMES**, 4 h.p., 1914, bought June, 1915, fixed gear; bargain, £25.—Collins, 192, Windmill Lane, Smithwick. [X0187]

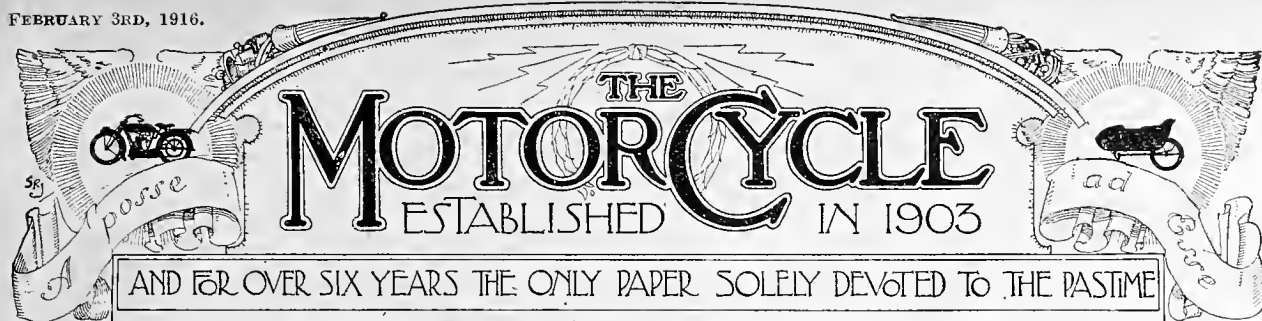
**JAMES** Late 1915 Combination, complete with lamps, horn, apron, not run 1,000 miles; £60.—Stevens, Gooch St., Birmingham. [X0238]

**JAMES**, May, 1915, 3 1/2 h.p., 3-speed countershaft, chain drive, as new; what offers?—A. Darrington, Penrhyn, Holt Whites Hill, Enfield. [8883]

**JAMES**, 1915, 2 1/2 h.p., 2-stroke, 2-speed lightweight, in splendid order; £29/10.—Eice and Co., 15-16, Bishopsgate Av., Camomile St. E.O. [0492]

**JAMES** 1916 Combinations, actually in stock, £80/15; one with Lucas lighting set, £97/7.—T. Stevens (James Expert), Gooch St., Birmingham. [X0237]

**1914 1/2 James**, 4 1/2 h.p., 3-speed countershaft, kick start, James Canoelet sidecar, Lucas lamp, new condition; trial: £45, complete.—Hallam, Rosedale, Dove Holes, Stockport. [X0101]

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**Six Thousand Recruits.**

**N**OW that compulsory service is at hand, we may pause to record in figures the services that it has been the privilege of this journal to render in the matter of voluntary recruiting. At the outbreak of war, when this country—not entirely to its discredit as a peaceable nation—was caught entirely unprepared for war on land, it was clear that strenuous efforts would be required on the part of Great Britain to uphold the cause of the Allies. It was patent, too, that motor cyclists as a body, being mostly of a young and energetic class possessed of overflowing patriotism and enthusiasm, were destined to take a great part in the world conflict. That being so, we lost no time in utilising *The Motor Cycle*, with its huge following scattered all over the world, as a recruiting medium, particularly, of course, for the motor cyclist sections. It is a tribute to British patriotism that never an appeal has passed unanswered, whether it has been R.E., M.M.G.S., R.F.C., or A.S.C., M.T. When in years to come one halts to reflect upon the organisation of our Army, nothing will be more stirring than the vision of splendid young fellows rolling up in hundreds to answer the call. Now as the end of the voluntary term of enlistment is approached, we look back with no little satisfaction upon having passed the 6,000 mark, this number representing recruits whose applications for enlistment we have handled personally. It is hardly necessary for us to interpose that this number by no means represents the total number of motor cyclists serving in H.M. Forces, as thousands are rendering yeoman service in the infantry ranks and various other sections of our big Army. Neither do we attempt to estimate the number of men who, in response to announcements in the editorial columns, have proceeded to the centres named and enlisted direct.

Originally, by reason of the immense influx of recruits, it was impossible for recruiting officers

to give motor cyclists the specialised attention necessary; consequently, after a time, we received direct appeals from Army officers to assist, and the Editor was subsequently appointed an Inspecting Officer for Royal Engineer Despatch Riders, and authorised by the C.O. of the Motor Machine Gun Service to examine motor cyclist and car driver recruits in their technical ability, and to accept those proficient. The men came from all over the British Isles and were frequently referred to us by their local recruiting officers. Work of this kind must necessarily be outside the scope of the ordinary recruiting officer, whose main duty is to fill the line regiments.

It is hardly necessary to say that our work has been entirely honorary, since we have regarded it as a duty and a pleasure to assist the hundreds of readers who applied. On many days quite a formidable number of applications were received, which involved the help of several assistants. We value highly a letter received last June from Lord Kitchener, which was followed by a hearty appreciation from the Commanding Officer of the M.M.G.S. (Lt.-Col. R. W. Bradley, D.S.O.), and other officers. One of the pleasantest features in this work is the number of letters which we receive from men on active service, and which indicate in no unmistakable manner how the writers feel they have still another bond of union with this journal. Though it is a fact that the record number of 6,277 motor cyclist recruits have passed through our hands we do not parade the fact as a virtue, but rather as an illustration how *The Motor Cycle* has proved a national asset in this time of stress, in directing keen recruits to the proper and most suitable channels, besides having offered enrolment with the minimum of trouble and delay to the recruit.

Henceforward, our energies are to be directed more to the examination of men applying for the specialised sections of the Army in which motor cyclists figure most strongly, and certifying their proficiency or otherwise.





# Ladies and the Motor Cycle

Useful and Practical Dress Designs Reviewed and Illustrated.


By MAY WALKER.

**D**ISCUSSIONS on dress are ever interesting to the feminine mind, and opinions differ more if anything than on other subjects. However, the following hints and suggestions, founded on practical experience, can be followed by the lady motor cyclist without much trouble or expense.


### Prize-winning Designs.

In the first place, I would like to refer to the winning costumes in the motor cycling dress competition promoted some time ago by the *Ladies' Field*. The first prize of an open-framed Douglas spurred on riders and "would-be" riders to tax their ingenuity in dress designing, and many interesting suggestions resulted. Of the three prize-winning outfits, personally I consider that there is very little to choose, as regards practicability and appearance, between first and second prize designs. The winner of the first prize did not solve the difficulty of garb for the rider of a man's machine. Her contention was that the frame of the motor cycle be cut to fit the dress rather than the skirt to suit the mount, and, on that principle, any kind of strong, tailored costume can be worn on an open-framed model so long as the skirt is not made too long.


The second prize costume comprises an ordinary walking skirt made with buttons to unfasten down the front, such as I have previously recommended in these columns. It is comfortable and not at all unsightly when on the machine. When buttoned up, it gives no indication of being anything unusual—a small advantage appreciated by the woman rider who has no wish to attract attention when she has dismounted. For the latter reason, I would favour an oilskin coat or Burberry to cover the clothes when riding, so that when discarded the rider shows no signs of travel.




The second prize design, submitted by Mrs. Mortimer. It can be used on a lady's or man's machine.



The practical and attractive outfit, awarded first prize in *The Ladies' Field* competition.



Design for lady motor cyclist's costume evolved by Mrs. Evelyn Saxby, and awarded third prize in *The Ladies' Field* competition of two years ago.



A lady motor cyclist wearing the adaptable hat and the "Striside" skirt. The former is an all-purpose type of headgear. For riding in bad weather the ends may be twisted round the neck and fastened by the cord to buttons, so affording protection for the ears.

## Ladies and the Motor Cycle.—



The "Striside" skirt—a practical garment for walking or motor cycling.

The "Striside" skirt is a sensible garment made by Messrs. Harrison and Co., of Hammersmith, with a corset top and a divided skirt which falls into graceful folds both on the machine and off. It is especially suitable for long journeys when a change of garment at the end of the day is possible. It is really a combined motor cycling and walking skirt and will appeal to many.

An oiled silk mackintosh would be ideal for motor cycling if it could only stand hard wear. It is lightweight, soft, and pleasant to wear, but it must be left for the sidecar passenger, whose movements are less calculated to tear it. With a woollen coat beneath it the wearer is warm and impervious to all kinds of weather. The ordinary kind of oilskin coat, with a belt for the waistline, is the best coat for the

rider, and a sports coat beneath is better than the cloth coats suggested by competitors in the competition referred to above.

## Hats.

The oiled silk hood shown on the right is the best contrivance I have found for keeping a hat in place, and free from dust and rain. Any small hat could be comfortably worn under this. Or if the silk hood be worn over the adaptable hat that I have shown a neat winter headgear is possible. The hood is made to fasten under the chin, and is a far better shape for ladies' wear than the ordinary sou'-wester. The softer material, too, allows it to be rolled up for the pocket, where it takes no more space than a handkerchief. This hood, too, makes the usual veil unnecessary. I have seen no other hoods advertised than those I myself possess, so I venture to give the address of the manufacturers, Messrs. Anderson and Abbott, Harpenden, Herts. The hoods are made in many charming shades and sold at a nominal figure.

## Gloves and Goggles.

For summer wear, reindeer gloves are strong and not too weighty, but in winter I have found nothing to equal the wool-lined fur-backed leather. A good pair can be bought for about half-a-guinea. I do not favour gauntlet gloves. They are not so warm for winter and unnecessary for summer.

Personally, I rarely use any protection for the eyes, but I quite understand that some riders would find goggles necessary. I dislike



Ordinary oilskin coat for driver and oiled silk coat for passenger. Both driver and passenger present a neat appearance and are ready to face the worst elements.

glass goggles, and if I used any they would be the mica ones, bound with chenille suggested by one of the *Ladies' Field* winners.

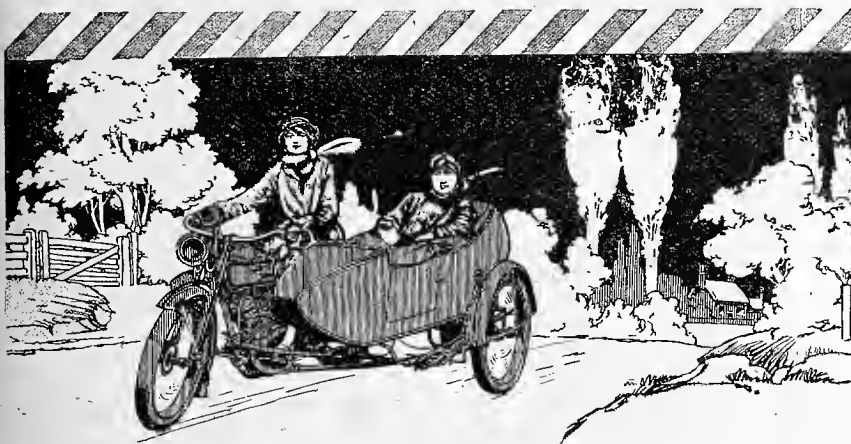
## The Importance of Suitable Footwear.

Spat puttees over brown leather boots provide the warmth and protection needed in winter, while the stout-soled brogue shoe is sufficient in summer.



Efficient mudshields are necessary if the lady rider is to keep her clothing free of mud splashes on a winter's run. The type illustrated above, allowing cooling air to pass to the engine through the centre opening, has proved very satisfactory in practice on our lady contributor's machine.

In conclusion, I may refer to the illustration of a mud shield made of hammered tin which is a combined protection for both rider and machine. It is at present fitted to an Ariel that I sometimes drive, and which is used in all weathers and over all kinds of roads.



An attractive drawing which appears on the cover of the 1916 catalogue of the Harley-Davidson motor cycles, just issued. This catalogue, incidentally, is well got up, and is quite out of the ordinary, having an index arranged according to the marginal headings on the right-hand pages.

# POT-POURRI.

## A DOCTOR'S SUGGESTED DESIGN FOR A TOURIST MACHINE.

**I**N this article I have endeavoured to outline a design for a 4 h.p. fast tourist machine, utilising for this purpose various "good things" which I have come across at one time or another. I hope the gentlemen responsible for the various parts I am making free with will pardon this summary dissection of their products. My apologies are due principally to Mr. Scott. He will have the satisfaction of knowing that my attempt at "painting his lily" is due to a keen admiration for his machine.

The desiderata for a fast touring machine, to my mind, are (1) "road worthiness," under which heading come efficient springing, good steering, and freedom from skidding propensities. (2.) Ability to stand the racket of sustained speed. In other words, *stamina*.

I shall now endeavour to outline the machine I should like to build.

I would start with a Scott frame. A fairly wide riding experience has taught me that no diamond-frame machine can surpass the Scott open frame for the aforementioned "Roadworthiness." To this frame I would fit Druid forks, replacing the upper pair of rigid links by a pair of Terry's spring links. This springing gives excellent results, both from the steering-comfort point of view and from that of tyre wear. The rear stand would be of the spring-up variety as fitted by Norton and by Rudge-Whitworth. Why this simple, efficient, labour-saving type of stand is not universal passes my comprehension.

Front and back wheels would be built up with Roman rims (flat base), heavy gauge spokes, and genuine water and mudproof hubs.

Both wheels would be easily detachable by undoing not more than two nuts, without disturbing brake mechanism.  $26 \times 2\frac{1}{2}$  in. tyres should ensure freedom from puncture trouble.

### The Engine.

Obviously, the simplest course is to stick to the Scott engine and radiator, and on this basis I will proceed. Everyone knows the Scott is a water-cooled twin two-stroke, fitted with an outside flywheel and two driving sprockets.

A three-jet Binks carburetter would supply my engine with the necessary gas. I would further suggest that an induction pipe be cast integral with the engine instead of using the stub adapter as is necessary on present models. This would avoid air leaking troubles, which I found inseparable from this fitment, as the induction pipe has to support the weight of a heavy carburetter. As a result vibration sooner or later loosens the joint.

The radiator and connections, to my mind, are ideal—simple, efficient, and neat.

The exhaust I should conduct to the extreme rear of the machine by large bore piping direct from the exhaust manifold. If desired small silencers could be fitted there. Back pressure, so fatal in a two-stroke, would be markedly eliminated thereby.

### Transmission.

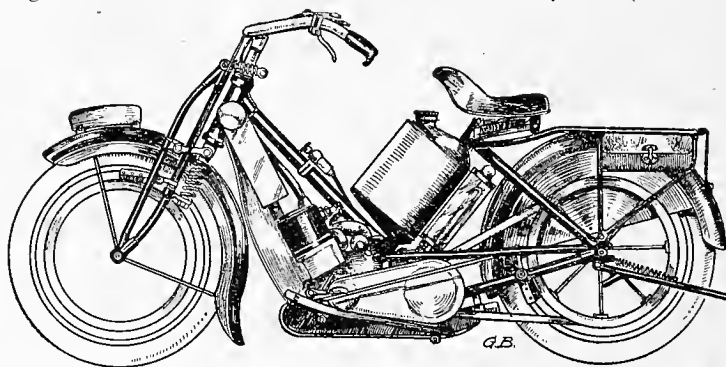
A countershaft gear box providing three speeds is essential for tackling anything in the way of bad hills with absolute confidence. I would therefore adopt a three-speed gear box, for preference a Sturmey-Archer with handle-bar-controlled clutch. The difficulty with this fitment would be the matter of alignment of the chain and belt, as the chain drive would be taken from the left-hand sprocket to the gear box and from the gear box to the back wheel by belt (1 in. section). I purposely chose

belt for the final drive because of the simplicity and easy removal of the back wheel allowed by this system. A countershaft gear box, as delightful to use as the Sturmey-Archer and designed for this particular machine, would be ideal. On the off side, well shielded by the crank case, I would place the magneto, taking the drive from the right-hand engine sprocket. If possible a positively driven oil pump might be worked from the crankshaft on the off side as well. This pump would be the heart of the lubrication system as fitted to the 3 h.p. Enfield twin. The glass oil reservoir could be situated behind the petrol tank. In addition, a tell-tale oil flow indicator on the down tube in front of the rider would acquaint the rider of any stoppage of circulation.

For a magneto I plump solidly for the British C.A.V. I want nothing better. In the course of my runs I occasionally meet on the road riders whose magnetos "are too proud to spark." Hence my preference for the British article.

A machine built somewhat on these lines would, to my mind, be a success. Detail fitments are largely a matter of personal taste. These I have left alone. Mudguarding could be improved by the enclosing of the top half of the rear wheel on both sides with light, easily detachable shields. In the front shields *à la* Scott are quite efficient. An improvement would be the fitting of a light aluminium undershield, as in car practice, extending to the extreme width of the footrests and from the engine to behind the gear box, so protecting not only the rider's feet but all working parts of the engine and transmission.

M.B.



Design for tourist machine outlined by writer of this article.

## OCCASIONAL COMMENTS.

By "IXION."

**Standardisation!**

I happen to be busy experimenting with a number of carburetters. Of course, I expected that I should need a different petrol pipe for each vaporiser; I do not grumble about that, as I don't wish ingenious designers to be hampered by such arbitrary factors as a fixed location for the entry of the feed pipe into the float chamber. But, not being experienced in the manufacturing sides of the industry, I was a little surprised to find that I needed a store of about a dozen different coned unions and nuts to be sure of fitting up my various gasometers on one and the same motor bicycle.

**My Dimming Dodge.**

Mr. R. O. Clark's dimming disc is the idea of a mechanic; mine the notion of a sempstress. But I flatter myself that mine can be slipped into a pocket very handily. I need mine for the localities where one thickness of tissue paper is enforced, and it consists of a muslin bag, covering the entire lamp, and drawn tight by strings threaded in a deep hem at the back. It is split up both sides, so as to clear the bracket arms; the string is divided and fitted with a spring-eye coupling. It seems to satisfy the police. Moreover—but this is strictly *entre nous*—I think it allows more light to filter through than the Home Office tissue paper; but that is as may be.

**Improving Two-stroke Carburation.**

I wonder how many of my readers have discovered that two-stroking at slow speeds is improved by fitting some form of atomiser over the spraying nozzle? Apparently the engine suction at low speeds is insufficient to vaporise the petrol properly, and one is apt to get a lumpy mixture, so introducing one more factor in favour of the perfect combustion—I had almost said of "an incombustible mixture." Some carburetters fitted to these mounts are already equipped with special atomising fittings—the brass pepperpot of a B. and B., the drilled penthouse of an Amac, and the cross funnel of a Senspray. But if any reader is using a plain, open-mouthed jet on a two-stroke, he should try the effect of adding an atomiser. I believe Terrys supply a coiled wire contrivance which can be slipped over such jets. It makes for economy and regular firing at low speeds.

**A Mixture Knock.**

I have been running in a new engine, which was delivered in rather a stiff condition; and after the first hundred miles or so, a knock developed, perceptible especially when climbing hills slowly, or picking up after a corner. As such knocks seldom cure themselves, I took the engine down, but without finding any ostensible explanation, and it was with rather a baffled sensation that I put everything together again. Pending this examination, I had postponed certain slight attentions to the carburetter, which had seemed well adapted to the pristine stiffness of the engine, but ceased to afford even acceleration as the bearings bedded home. Still musing upon the mysterious knock, I set to work on the carburetter, and when the readjustment was complete, hey presto! my engine knock

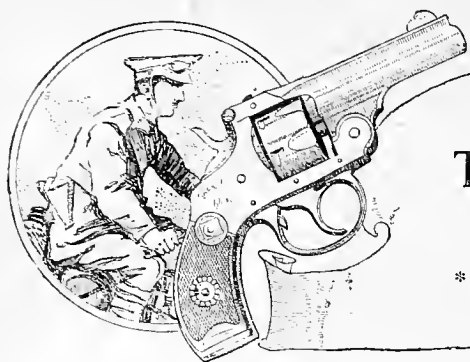
had disappeared. I do not state these facts with any dogmatic confidence in the implied solution. On the face of it, it looks as if the knock was ascribable to bad mixture, and was analogous to the hill-climbing knock which every novice soon learns to cure by shutting his air lever a trifle; or perhaps I should say "soon learnt," as this particular knock is much less evident with the modern semi-automatic carburetter than it was with the old "sensitives." My favourite crony scouts the implied conclusion, on the ground that the engine, when stiff and new, would require an over-rich mixture, and that I must have weakened the mixture when I reset the vaporiser. Unfortunately, I do not know whether this is so or not, as I stuffed in the only spare jet I had before experimenting with a broach, and the spare jet happened to suit; nor can I find the old jet for purposes of comparison. However, on the chance of the facts being as they appear, I should value some technical explanation from a reader learned in the ways of gases; adding a proviso that the Editor will not allow the time-honoured discussion on knocking in all its forms to be revived just yet.

**A Disgruntled Australian.**

The post has just brought me an extremely irate letter from a pseudonymous Melbournian who purchased a Low generator, largely as the result of my jottings upon it, and met nothing but trouble. I wish it were less libellous, as I should like to share the pleasures of its wit with my readers. His experiences are so fundamentally opposed to my own that I am left to speculate as to their origin. Is he one of those uncanny individuals for whom nothing will ever come off, resembling, in a motoring sense, a friend of mine, who is always brought to death's door if he unwittingly eats a dish with eggs in it? Or has he been genuinely unfortunate and got hold of a seriously faulty generator? Or has his sample been badly knocked about on its long journey to him? Two of his points I commend to the notice of the manufacturers.

He complains that the generator was supplied to him minus a bracket, and that he had to pay 5s. 6d. to have a bracket made. The generator is certainly designed to fit in the rear prong of a standard Lucas or F.R.S. bracket; but not everybody uses this bracket. Firms who sell generators minus lamps, especially at a high price, would be more popular if they gave the option between the existing Low type and another type with a single arm top tube holder. Lastly, he emphasises the difficulty of maintaining a gastight joint between the broad flat rim of the container and the top. In this I thoroughly agree. I have struck the same hoodoo, and have removed the standard rim in favour of a narrower type. My correspondent has soldered a double ring of brass wire round the rim to give the rubber washer something to bite on—this is a simpler cure than my process. He has further removed the spring above the rubber bellows valve; I warn him that this will lead to trouble, as there is now no particular reason why the bellows valve should close when more water is required to be put in.





## The Best Motor Cycle War Story.

\* "Adventures of a Despatch Rider."



**C**APT. WATSON, a Balliol man, decided on July 25th, 1914, to take part in the Great War.

When Great Britain came in, and he read in the papers that the War Office wanted motor cyclists, he decided that a motor cyclist he would be, so he went straight up to Great Portland Street, and arranged to buy himself a mount. At 4.45 p.m. the same day he was a corporal in the Royal Engineers. We have not met the author, but we can imagine him to be the best type of man who rides a motor bicycle. He tells his story in a very human way, and in an easy pleasant style which shows he possesses literary ability in no mean degree. It is the first instalment of the motor cycle despatch rider's history of the war, extending from the time war was declared until well into last year, when the romance of the D.R. faded, owing to the fact that both armies had retired to their earthen burrows. Those gallant lads saw life in those days; they retreated and advanced, and then changed their quarters. Much happened in that period, all of which the author relates in a manner which calls for sincere admiration. It is indeed good reading. How the men left Ireland and landed at Havre brings back sad memories of an old friend, one of the first motor cycle officers in the Army who went through it all, and has now earned his well-deserved rest along with one of the Cecils to whom the author refers later on.

### The First Shell.

It was near Mons. "We had already heard guns, but on my way back I heard a distant crash, and looked round to find that a shell had burst half a mile away on a slag-heap, between Dour and myself. With my heart jumping against my ribs I opened the throttle, until I was jumping at 40 m.p.h. from cobble to cobble. Then, realising that I was in far greater danger of breaking my own neck than of being shot, I pulled myself together, and slowed down to ride sedately home." Brave deeds were done by the D.R.'s in those early days. "Huggie took a despatch to the 13th, and returned under very heavy shrapnel fire, and for this he was very properly mentioned in despatches." "They (the Heavies) had run out of fuses. . . so, Grimers was sent off with a haversack—mine—to fetch fuses and hurry up the lorries. How he got there and back in the time that he did, with the traffic that there was, I cannot even now understand."

During the retreat there was much that happened. "On our way we came across a deserted motor cycle. Someone suggested sending it on by train, until some-

one else remarked that there were no trains, and this was fifteen miles from Paris! At Tournan, appropriately, we turned. We were only a few miles S.E. of Paris. The Germans never got farther than Lagny. There they came in touch with our outposts, so the tactful French are going to raise a monument to Jeanne d'Arc—a reminder, I suppose, that even we and they committed atrocities sometimes."

### The Advance.

After lucidly describing the great retreat and its miseries the author refers to the advance, and dilates upon the joy which filled the hearts of our gallant soldiers when the order came to go forward. "We accepted any quantity of luscious fruit, the French were more than hospitable at that time. . . In a quarter of an hour Maj. Hildebrand (now a colonel and recently mentioned in despatches) . . . turned up in his car." How glad the inhabitants were to welcome our men when they came to those villages which the Germans had so rapidly evacuated. "A small girl of about eight brought me her kitten and wanted to give it to me. I explained it would not be very comfortable tied with pink ribbons to my carrier. She gravely assented."

Earlier in the story one despatch rider went off on a mission and was never seen again. During the advance another met his death. "He crashed into a German barricade, and we found him next morning



**EASTWARD BOUND!** A group of R.E. despatch riders, who have lately completed their training in the Bedfordshire district, now en route to the Near East.

\* Captain W. H. L. Watson. William Blackwood and Sons, 5s.

## The Best Motor Cycle Story.—



German prisoners employed for road cleaning and repair in France. The British despatch rider on the left says the Germans are quite happy on this work, and no doubt prefer it to idling

with his eyes closed, neatly covered with a sheet, in a quaint little house at the entrance of the village of Doué."

**Riding under Fire.**

"A clever despatch rider may reduce this to a fine art. He knows exactly at which corner he is likely to be sniped, and hurries accordingly. . . . He does not race along with nose on handle-bar. That is a trick practised only by despatch riders who are rarely under fire. . . . The experienced motor cyclist sits up and takes notice the whole time. He is able at the end of the ride to give an account of all he has seen on the way. . . . On a motor cycle, if you are going rapidly you cannot hear bullets or shells coming, or even shells bursting unless they are very near. Running slowly on top with the engine barely turning you can hear everything."

**Not a Tragedy of War.**

The scene was a deserted and much battered village. "My engine silent, I could only hear a little whisper from the houses opposite, and a dripping that I did not care to understand. Farther on a house had fallen half across the road. I scarcely dared to start my engine again in the silence of this desolate destruction. Then I could not, because the dripping was my petrol, and not a slaughtered animal. A flooded carburettor is a nuisance in an unsavoury village." The English Tommy taught the French much they did not know of their own language. "If you pronounce Hinges in the French fashion; you give forth an exclamation of distressful pain. The name cannot be shouted from a motor cycle . . . so we all called it plainly and bluntly Hinges, as though it were connected to a door." The inhabitants noticed this. Thinking that they and their forefathers had been all wrong, for surely these fine men with red hats knew better than they, the English pronunciation spread.

—The village became "Ingees, Le Cateau is Lec Catoo, Boescheppe is Bo-peep, Ouderdon is Eiderdown," and we may add that Villers-Cotterets is Villager's Cottages.

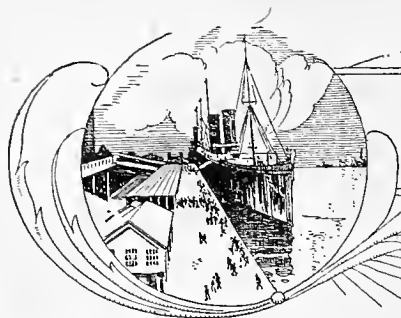
Those motor cyclists of the famous fifth division saw much service. Mons, Le Cateau, Crepy-en-Valois, the Marne, the Aisne, La Bassée, the Defence of Ypres, St. Eloi, Hill 60, and the Second Battle of Ypres. Truly a fine record." In connection with the attack on La Bassée, the writer says: "I was sent with a message for the Devons. It was the blackest of black nights, and I was riding without a light. Twice I ran into the ditch, and finally I piled up myself and my bicycle on a heap of stones lying by the sides of the road. I did not damage my machine. That was enough—I left it and walked." On getting his commission in the cyclists, Capt. Watson writes, "I had worked with the others for nearly seven months, with Huggie, who liked to be frightened; with George the arch scrounger (forager); with Spuggy, who could sing the rarest songs; with Sadders, who is as brave as any man alive; with N'Soon the Dashing, of the tender skin; with Fat Boy, who loves 'sustaining' food and dislikes frost; with Grimers and Cecil, the best of artificers; with Potters and Orr and Moulders and the Flapper. I cannot pay them a more efficient tribute than the tribute of the Commander-in-Chief. 'No amount of difficulty or danger has ever checked the energy and ardour which has distinguished their corps throughout the operations.'"

And so ends the best unfinished history of the despatch rider, and the finest tribute to the pastime since the motor cycle was.



"I DON'T WANT TO BE A JUDGE!"

An amusing photograph taken at a Services competition. For the benefit of overseas readers it may be explained that the letters on the nose of the sidecar stand for Headquarters Constabulary Detachment (London).



## Extracts from Overseas Letters.

AFRICA

AUSTRALIA

### The Opinions of Motor Cyclists scattered all over the World.

**W**E continue the feature, commenced last month, of quoting extracts from letters of readers in far-off lands. We pride ourselves upon a continuous inflow of communications from keen readers of *The Motor Cycle*, and a not inconsiderable percentage are from men in the British Empire Overseas. A study of the opinions expressed adds emphasis to several well-known facts, among them the desirability of rear springing, stronger rims, larger tank capacity, and larger tyres. One Antipodean correspondent brings up a simple point which is very often overlooked by manufacturers, that is the desirability of arranging the carburetters to provide plenty of extra air, seeing that the machines are to be used in much hotter climates than that which exists at home. The average novice does not know how to correct these simple matters, even if he desired to "tinker" immediately he had taken delivery of his mount.

As regards the items to which attention is directed with a view to strengthening the different parts, it is hardly likely that the majority of makers will need impressing with this fact when normal outputs are resumed, seeing that they are having the benefit of exceptional experience in the war zone, the conditions here constituting the nearest approach to the state of affairs in Oversea Dominions. As a natural result sturdiness will be the keynote in the design of new models after the war.

Overseas readers are constantly writing and asking if it would not be possible for manufacturers to put the prices against the various articles they advertise. One writes from Penang: "It means nearly three months to obtain such information, then add another three to write and get one, and nearly a year has gone."

#### Prices of Machines.

MR. M. STOLTENOFF, Hunters Hill, New South Wales: "I think that the prices of some of the modern English machines on the market here are most extortionate, and can never see where the value comes in. For example, for a modern Chater-Lea here agents are asking £130, whereas for the best American machine they are only asking £85 with just the same fittings. There is no doubt, in my opinion, that the American machines will get a very strong hold on this market before long, especially as some of the best riders here are giving up English machines for American ones."

#### Suitable Finish.

MR. E. CLARKE, Christchurch, N.Z.: "I own two motor cycles, a 2½ h.p. lightweight for solo work, and a 3½ h.p. twin for sidecar. The finish of the lightweight is black, while the other is khaki colour. My experience is that the neutral colour is more suitable for conditions out here than black. In dry weather, after cleaning my black-finished machine, a very short ride makes it look just as bad as

before it was touched, whereas with the other machine I may neglect it for a considerable time, and its condition is hardly noticeable.

"So far as New Zealand is concerned, sole agencies are a curse to motorists. My own machine is a very good one, but after the treatment I have received, I shall not be able to purchase another of this make in the future."

#### American Machines.

MR. C. WEATHERLAKE, Newcastle, New South Wales: "I have been riding motor cycles since 1903, and in the course of my business as a traveller cover some 12,000 to 15,000 miles per annum over some of the worst roads in Australia. I have a new bicycle every year, and at present am riding an 8 h.p. three-speed Harley-Davidson, which, after 4,000 miles, is in perfect condition, and is as good as new. This, for our roads and my work, is the best machine I have ever had. I can ride 200 miles in the day, and at the end of the run not a drop of oil is visible on the crank case.

"I may state that *The Motor Cycle* is eagerly read when I return to Newcastle every week."

#### Transmission Troubles.

MR. W. HILL, Bathurst, New South Wales: "As to the 'Chain v. Belt' question, I will not attempt to argue as to the well-known merits of each, but in this part the belt is more popular. When chains are in use they should be totally enclosed. Where the chains were not enclosed I know of a couple of instances where the machines needed the sprockets renewing every twelve months.

"Rear springing would be welcomed by Colonial riders, to whom a fifty-mile trip over some of the Australian main roads is something to be dreaded. It should be strong and durable, however, and not too flexible. Too much of the latter would be worse than none at all.

"There are a number of other details which I will mention, about which no argument is required, such as improved lubrication, wide handle-bars in preference to the narrow English touring type giving so little control when ridden solo, good mudguard clearance, large toolbags, well armoured, and at least 2½ in. tyres."

#### Manufacturers' Prices.

MR. IVOR F. MUNRO, Cootamundra, New South Wales: "Advertisers of accessories should quote weight (packed) of their speciality. This may seem a small matter (and so it is), but it may mean the sending of an order or not. For instance, I would like to experiment with a certain carburetter. The makers advertise the price of the carburetter in England. The carburetter possibly weighs, say, 2 lb. It may be packed in a card box weighing a further few ounces, or it may be put up in a solid wooden box (for safety in transit) weighing more than the article being sent. Regarding local prices, I am afraid the only way to lower these appreciably would be for an English manufacturer to open a branch here and do away with the agency. As it is the articles have so many profits to be added to them that they always seem to be attached to an aeroplane—a high flying one at that. I have been riding a Bradbury 3½ h.p. single since 1912, both for business and pleasure, over all classes of country. The only time I have been 'left' by it was when a motor car ran into it and broke the front forks. It has plenty of clearance, a sturdy

# THE ARRIVAL OF THE 1916 MODEL

# American EXCELSIOR

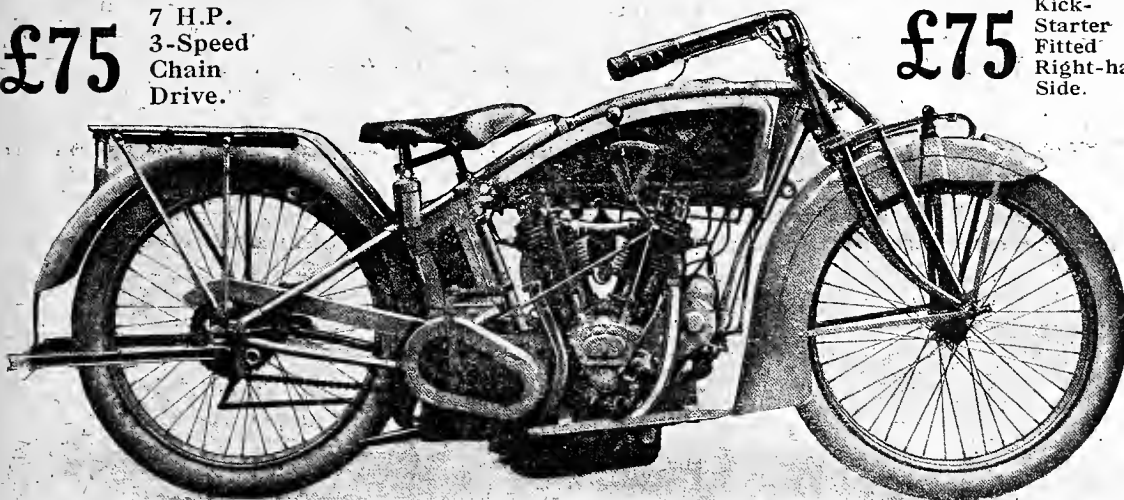
## BETTER VALUE THAN EVER.

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3-Speed  
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The most perfect motor cycle it is now possible to produce.  
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The serene consciousness of personal safety, with absolute  
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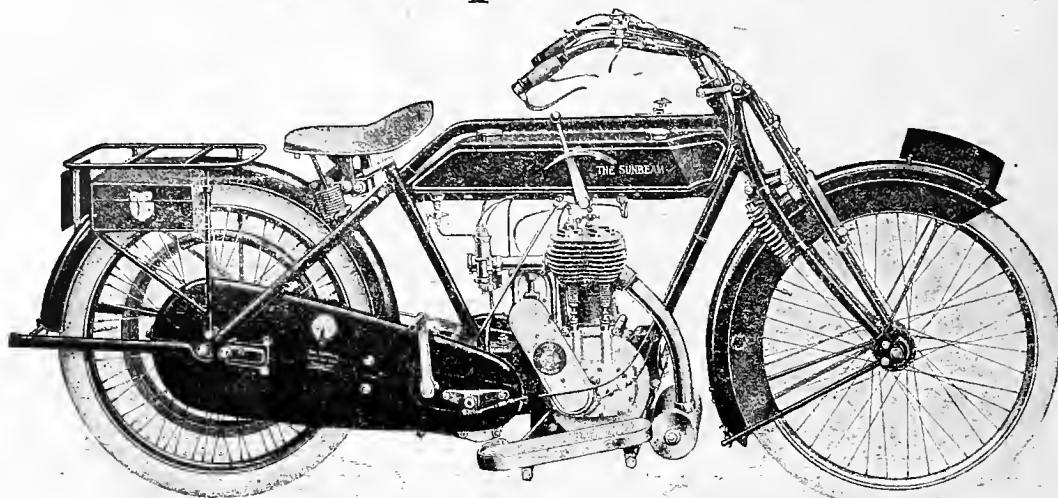
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# Edmund

## THE Spring Frame Motor Cycle

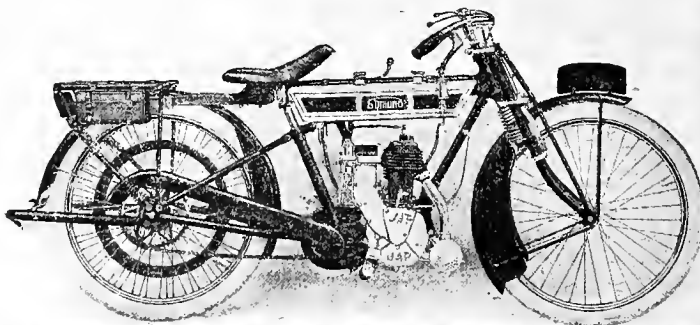
— the machine that solves finally and for all time the springing problem. Note its specification:—

ENGINE—2 $\frac{1}{2}$  h.p. J.A.P. single-cylinder, bore and stroke 70×76, cubic capacity 292 c.c. GEAR—Enfield 2-speed gear incorporating patent slipping clutch and cush drive. CARBURETTOR—Amac, straight through type. IGNITION—Variable, M.L. enclosed pattern, handle-bar control. TRANSMISSION—Entirely by Renold chain, giving smooth drive in connection with cush drive in back wheel. LUBRICATION—Best & Lloyds semi-automatic drip feed to crank-case. FRAME—Edmund patent adjustable spring frame made throughout of special reinforced tubing; springs can be adjusted in a few minutes to suit, exactly, weight of rider. Shock absorbers incorporated in compression bars. FORKS—Druid. TYRES—26×2 $\frac{1}{4}$  Avon (Druid type). BRAKES—Powerful foot brake on brake rim, large Bowden on front wheel. FOOTBOARDS—Footboards are fitted as standard, specially strong cranked footrests when specified. TANK—Double tank attached to top bar, pannier fashion; this member being sprung, petrol and oil are conveyed from their respective tanks by petrol-proof rubber tubing (in conjunction with copper tubing) as used by the British and French Governments on flying machines. Capacity: 1 $\frac{1}{2}$  gall. petrol, and 1 qt. oil. SADDLE—Specially padded pan-seat without springs, no lateral play possible. CARRIER—Strong semi-sprung carrier with two pannier tool bags and tools in tool roll. FINISH—All-weather finish (black); all bright parts heavily plated.

**Price 44 Gns.**

Then ask us for description Folder which tells you all about it.

**C. EDMUND & CO., LTD.,  
Crane Bank, Chester.**



## Extracts from Overseas Letters.—

engine, and a solid frame. I average, by speedometer, 6,000 miles per annum. Engine oil costs from 5s. 6d. to 8s. 6d. per gallon, petrol 2s. 6d. to 3s. (I think it is about 1s. 10d. in Sydney), valves 7s. 6d. each (without springs, cotters, etc.), 26×2½ or 2½ tyres, four-ply, £3 10s. each, and tubes 16s. By the way, mudguards should be made so that mud can be removed without detaching wheel."

## Road Dangers.

An officer on H.M.S. *Warspite* writes: "One of the greatest dangers on Australian roads are travelling flocks of sheep, which occupy the entire road, and at night are invisible until you are on top of them. If the drovers were made to carry a lantern or light of some sort many accidents would be prevented. I had an unpleasant experience, running into a flock in charge of a drunken drover. Fortunately, no damage was done, but a short brawl ensued before I was allowed to pass through the flock. These incidents are unpleasant, as there is no possibility of help, and if the drover chooses to be obstinate it is impossible to get on. The Zenith machine is about the best for Australia, as it is strong, well sprung, and a variable gear is essential on account of steep hills, which usually have a bad surface and must be climbed slowly. A popular machine is the 7-9 h.p. Indian, but, personally, I prefer the Zenith."

## They're all Good!

MR. C. STOKELL, Canterbury, New Zealand: "Concerning the type of machine most suitable out here, I do not think motor cycles could be restricted to one type, or ten as far as that goes, for all have their advocates, whether they be single or twin, heavy or light, chain or belt drive, and all find a ready market at a pretty stiff price. If a motorist is asked what is the right clearance, or any other detail, he cannot tell you in inches, but points you out his new cycle, and tells you it's 'just right'; it may be anything from three to six inches. Any ordinary standard model seems all right for this district. As far as I can see, the rims, which are far too light, are the weakest spot in most of the machines; they dent badly and frequently part at the brazed joint if ridden hard over main roads, loose stones accounting for this. The ordinary rim as fitted to most bicycles weighs about two pounds; a rim weighing four pounds with welded joint and built up with ten or sixteen gauge spokes makes a very fair wheel which will stand a good deal of fast riding. Rear springing is another detail which needs attention, but should not be constructed

regardless of weight as at present, with half a cart spring or two stuck on anywhere, but something light and simple, employing open coil springs of the Druid pattern which take both thrust and rebound silently and effectively. Designers of two-stroke engines who study economy should connect the release valve to the crank case instead of the exhaust pipe, for these engines as at present constructed continue to pump through as much gas when cut out as under working conditions; of course, the carburetter could be closed, but this is not done by most riders. Fixed-engined two-strokes when used for hard work in the country are belt destructors pure and simple. To make the belt grip when wet it has to be strained so tightly that it often breaks in the first run; also, the small end bearing seems to cut out very soon. There is a scarcity of 3½ h.p. twins on the Christchurch market, 3½ h.p. being the all-round bicycle here. Some riders swear by the single, but the fact that the twin seems much less liable to knock than the single puts it high in my favour. Lamps go fairly well when new, but after a while seldom give satisfaction, the gas blowing back through the water under the slightest provocation; they are my brother's pet grievance, and so sore is he on this point that he is making one in which the water is forced into the carbide under pressure—with such an arrangement, there being no chance of blow back, there should be 'some' light. Most roads in Canterbury are very flat, and a fair amount of sport can be had from any old machine."

## Riding Conditions in N.S.W.

MR. J. A. SIMPSON, Parramatta, New South Wales: "I have been taking your publication for several years, and may state that both my daughter and I read it thoroughly. My daughter has ridden since she was seventeen years old, and was, I believe, the second lady in Australia to obtain her rider's licence, the palm being carried off a few weeks earlier by a lady in Western Australia. My daughter has always taken a thorough practical interest in her motor bicycle, being able to dismantle and reassemble her machine, and knows more of motor cycles than many men on the road. It seems to me that English makers will have to look out for the American makers. As a sample: a well-known English twin of 6 h.p. now costs £115 in Sydney, while you can buy an 8 h.p. American at £85, and several riders that I know speak most highly of this make. My experience with back tyres (driving), when used for sidecar work, is that makers do not fit large or heavy enough tyres. I had two covers 650×65 not worn out, but cut through the walls in no time, which comes about by the fact that you cannot inflate enough to stop a roll when turning, and have now put on a 710×90 (on same rim), and have had a delightful time, with no punctures and no heartbreaking gashes. The clearance on sidecars, to my mind, is not high enough, and at least 5½ in. on bicycle is required. It is a marvel how machines stand up to the work on the roads about Sydney, which are the worst I ever struck—I know Melbourne, Victoria, and also South Australia—and speaks well for the makers of motor cycles. Makers of carburetters do not give sufficient extra air either on bicycles or cars. For instance, my machine came out with an Amac No. 30 jet and float chamber at back of jet chamber. I altered to 28 jet, put float chamber to front, drilled five holes ⅜ in. (vertical) in mixing chamber, and, in place of split pin holding needle above float, put another 50% wider to reduce lift of needle valve on account of rough roads. I have always ridden my Matchless with sidecar and 11 stone passenger. Given a fair road and average hills I do from 60 to 64 m.p.g. heavy benzine. Sidecars are very much on the increase, but I do not think anyone out here would attach a sidecar to any bicycle of less than 6 h.p."

[A further selection of overseas riders' opinions will appear in the first issue of March.—Ed.]



Wounded South African soldiers who were taken for an afternoon's run by Cape Town motor cyclists. Some of the sidecar outfits that were used may be seen in the picture.

# A 422 c.c. Horizontal Levis.

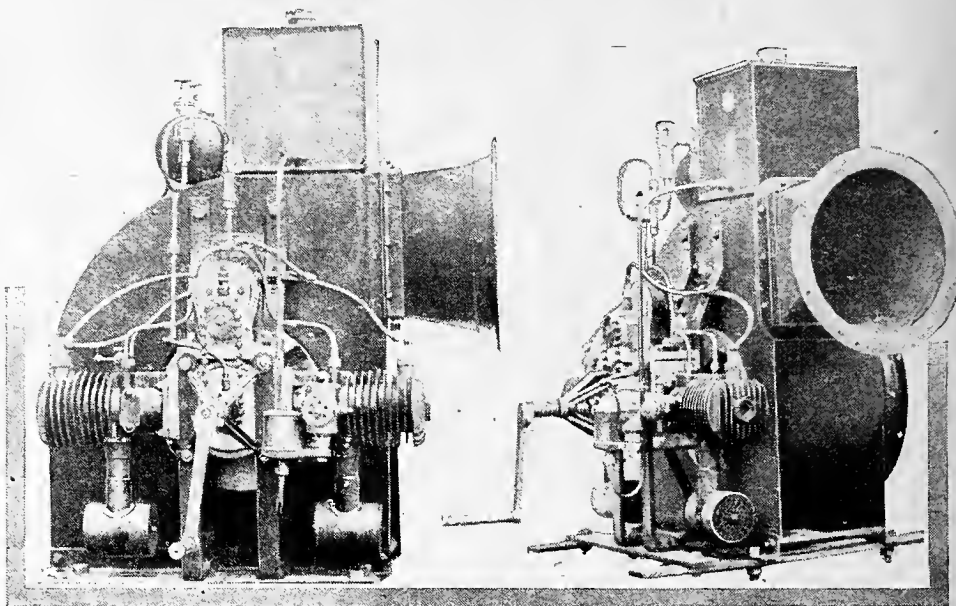
A New Type Engine  
used for Admiralty  
Purposes.

**H**ARDLY an engineering firm exists to-day but which is busily engaged in munitions of war of one sort or another, and, as we have pointed out on several occasions, motor cycle manufacturers are no exception to the rule. If it is not shells, it is aeroplane parts; if not aeroplane parts, it is field kitchens; if not field kitchens, hand grenades, and so on. But two or three selected firms—significantly enough, those producing horizontally opposed motor cycle engines—are busy in the manufacture of blower sets used for inflating airships after descent in order to keep the fabric stretched. Last week Messrs. Butterfields, Ltd., of Stechford, near Birmingham, invited us to inspect a batch of these sets going through their works.

On entering the test room we saw a mechanic get to work at the starting handle, and in three turns the little two-stroke Levis belched forth a raucous note what time the blower commenced operations sweeping up paper, shavings, and sending over small crates which were disposed about the floor, so strong was the draught produced. Mariners talk with bated breath of North Sea gales, but we should imagine it would be good practice for men of the R.N.V.R. to stand near a healthy Levis blower and imagine themselves on the bridge.

The engine fitted to this blower set is an entirely new one, and has not previously seen the light of day. Certainly it is but a reduced facsimile of the 5-6 h.p. horizontal twin which secured a notable success at Style Cop on its first appearance last autumn. This latter engine had two cylinders of the 2½ h.p. size, each of a capacity of 348 c.c. The new engine fitted to the blower has two air-cooled cylinders of the 2¼ h.p. Popular model Levis, giving a total capacity of 422 c.c.

The set is built on a flat iron base, the blower being supplied direct to the Levis Works by the Admiralty. A square petrol tank, holding one and a half gallons, is fitted above the blower casing, and at the rear is a cylindrical oil tank, the feed being governed by an ordinary B. and L. lubricator. From this lubricator there is an oil lead to each side of the crankshaft bearing, and another through a separate sight feed lubricator with an adjustment screw, this lead conducting oil to each cylinder, and again branched to feed each side of the hollow



Levis blower set for inflating airships. The engine is a new horizontal twin two-stroke of 422 c.c., which will later be used in a new model Levis motor bicycle.

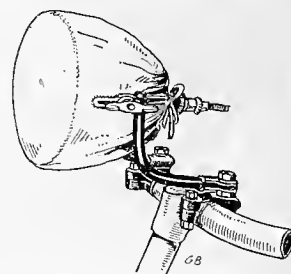
gudgeon pins. A C.A.V. single-pole magneto is used, which necessitates the fitting of a two-pole Lodge plug to one of the cylinders, on account of the fact that, a two-throw crank being used, the cylinders are arranged to fire simultaneously. A marine type Amac carburetter is fitted, which gives wonderfully easy starting from cold in the two instances of engine sets which were started up for our inspection. It may be interposed that the handle starting is arranged direct on the engine-shaft. It will be seen from the illustration accompanying that the flywheel is enclosed in the blower casing, the runner of the blower being coupled direct to the crankshaft. The shaft is a plain two-throw stamping of Ubas steel without balance weights of any kind, the fact of the two cylinders firing together providing almost perfect mechanical balance, though, of course, the firing torque cannot be so good as an engine having even firing.

## A New Horizontal Levis Promised.

Naturally, our conversation with Mr. W. H. Butterfield turned to the possibility of the engine being used in a motor cycle frame, and we were told that already one of the 422 c.c. engines had been tried on the road in a frame, and had given great promise, its most notable achievement being the ascent, on a 4¼ to 1 top gear, of Ankerdine Hill, which is a fairly long and tiring ascent of about 1 in 8. Messrs. Butterfield have every intention at the moment of adopting this 422 c.c. model as a standard Levis production, and were it not for the needs of the Admiralty one of these sets would very quickly be mounted in a finished frame with a view to prolonged testing, but that desirable step must be postponed for the present.

The larger 5-6 h.p. engine, the size of which we have already given, will ultimately be water-cooled, and will almost certainly figure in a light cycle car anon.

There is usually something to see of interest at the Levis Works, and on the occasion of the present visit, after examining the blower set, we were invited to witness sidecar stunts on the Levis test hill. It will be recalled that this test hill is an artificial one running to the roof of the Levis Works, the gradient being as steep as 1 in 3. It was originally intended for motor bicycles, but a 2½ h.p. model Levis with an Enfield gear, having a low ratio of 14 to 1, has now been fitted up with a light sidecar attachment, and the venturesome may enjoy the hair-raising experience of being shot up the hill with barely three inches to spare on either side. Keen though we are to try any new motor cycle, we preferred on this occasion to remain in the guise of an onlooker. Accordingly Mr. Butterfield produced two men out of the works to occupy the sidecar seat, and the little Levis tugged the three to the roof quite comfortably.



Dimming a lamp to comply with the "Lights Order" section of the new lighting regulations. Instead of tissue paper a muslin bag is fitted over the lamp—a method which can be recommended for electric lamps, though hardly safe for acetylene. This is the plan referred to by "Ixon."

## OVERSEAS GOSSIP.

## Motor Cycle Doings in the Empire Overseas.

## Indians in Australasia.

THE Hendee Manufacturing Co., we understand, have made an important alteration to their Australasian business, it now being transferred to a local company, controlled by Mr. J. H. Rhodes, with headquarters in Melbourne. The Hendee Co.'s Melbourne branch is consequently closed, and Mr. T. K. Hastings, who looked after the firm's Australasian interests, has returned to the United States to take up other important work on behalf of the company.

## Royal Enfield Wins in Spain.

A 3 h.p. Royal Enfield won the King Alfonso Cup in the International Motor Cycle Trials recently held in Spain. The 35 kilometres (roughly 59 miles) was covered in 1h. 52m. 31s. (=32 m.p.h.).

## Membership of the Cape Peninsula Club.

Membership of the Cape Peninsula (S.A.) Motor Cycling Club shows a slight falling off, according to the annual report issued at the end of the year. This is not surprising in view of the war, and when hostilities are over the membership roll will doubtless go up once more. At present there are 241 members, and the club's bank balance amounts to £116.

## 490 Miles Trial in New South Wales.

Results have just come to hand of a twenty-four hours reliability trial held over an out-and-home course from Sydney, N.S.W. The test included the ascent of the famous Blue Mountains, and the total mileage was 402. First three places were secured by the following, all of whom used Dunlop tyres:

- A. Biden (8 h.p. Harley-Davidson sc.).
- J. Audsley (3½ h.p. P. and M.).
- A. E. Thomas (4¼ h.p. B.S.A.).

## The British and American Export Trade.

A graphic illustration of the manner in which American motor cycle manufacturers are getting the British overseas trade now that exports of motor cycles from this country are necessarily limited (on account of war demands) is furnished by a statement issued by the Hendee Manufacturing Co. This is to the effect that during the months of October, November, and December, 1915, the foreign shipments to countries

outside the war zone or Canada have exceeded the entire shipments of the company's last fiscal year.

## Hill-climbing in Victoria.

The Victoria (Australia) M.C.C. hill-climb at Wheeler's Hill, near Melbourne, proved an unqualified success, and, incidentally, the supremacy of the British mount in open competition. Results:

- SOLO MACHINES UNDER 600 C.C.
- 1. E. Mayman (3½ h.p. Triumph).
  - 2. A. Cheadle (4½ h.p. Peerless).

- SOLO MACHINES OVER 600 C.C.
- 1. E. Gates (6 h.p. Regnis-M.A.G.).
  - 2. J. Booth (7 h.p. Indian).

## SIDE CARS.

- 1. J. Priestley (7 h.p. Ideal-Jap.).

There was a splendid entry list, comprising British, American, and Australian assembled machines.

## Victorian Half-mile Record.

Jack Booth, the famous Australian rider of Indian machines, has covered the flying half-mile at a speed of 81.81 m.p.h. This is the average of one run in each direction.

## The Use of Motor Cycles for Telephone Repair Work.

The British Columbia Telephone Co., who have practically a monopoly of the telephone business throughout the western Canadian province, make extended use of motor bicycles and sidecar outfits in repair work. At present the company operate with twenty machines, and these are used for the quick despatch of repair men and their tools to scenes of breakdown. The success of a telephone service depends on keeping down the number of breakdowns, and those that do occur to the minimum of time, and with the employment of motor cycles a considerable improvement has been effected in these respects.

## British Success in Canadian Hill-climb.

In the Toronto Motor Club's hill-climb at Davisville, Canada, the slow test was won by a Matchless and sidecar, the time being six minutes and a fraction, while the same machine travelling all out over the same course only occupied fourteen seconds.



## A FRENCH BY-ROAD IN WAR TIME.

This photograph, showing despatch riders on Douglases and a Rudge respectively, was taken in France, and provides a good impression of the difficulties in the way of grease and mud encountered by military motor cyclists.

## A Sidecar Outing for Wounded Soldiers.

LAST year, it may be remembered, The Motor Cycle organised, with the co-operation of a patriotic lady, a very successful sidecar outing for wounded Belgian soldiers. The reason that Belgian soldiers were taken instead of British was due to the curious idea dominant in the minds of the hospital authorities that the sidecar was not a fit and proper vehicle in which to take out wounded, the idea existing being the absurd one that sidecars "jolted."

Since those days, however, matters have progressed, and we have been successful in obtaining the very hearty co-operation of the secretary of one of the best known London hospitals—himself the owner of a sidecar combination—in the planning of another run of a similar nature. This gentleman has kindly consented to give his support to a run recently proposed by the Harley-Davidson Motor Co., Ltd., the idea being to run down in Harley-Davidson

passenger outfits to such a place as Burford Bridge a number of wounded soldiers, to whom lunch will be given, which will be followed by an entertainment, professional artists being engaged. All expenses will be defrayed by the Harley-Davidson Co. Owners of this make of sidecar living in the London district who will be able to co-operate in this very excellent scheme are invited to communicate with the company at Harleyson House, 74, Newman Street, W.





## SPECIAL FEATURES

COSTUMES FOR LADY MOTOR CYCLISTS.

OPINIONS OF OVERSEAS RIDERS.

6,000 RECRUITS.

## TIME TO LIGHT LAMPS

GREENWICH TIME

Feb. 3rd	...	...	5.19 p.m.
" 5th	...	...	5.22 "
" 7th	...	...	5.26 "
" 9th	...	...	5.28 "

## Exclusive Week-end News.

The *Motor Cycle* regularly includes all the week-end news, which accounts to some extent for the exclusive announcements we are able to make.

## Two-stroke Engine Problems.

Any reader interested in two-stroke engines who may not have read the very practical article in our issue of January 20th, entitled "A New Design of Two-stroke Engine," by James Martin, should make a point of doing so. An interesting correspondence on the questions raised commenced on page 91 last week, and is continued in this issue. Mr. Martin will shortly reply to his critics.

## Motor Cycles in Macedonia.

Those who expressed doubts as to the use of motor cycles in Macedonia will surely politely climb down upon reading the vivid letter from a despatch rider at Salonica that appears in the Military Notes of this issue. R.E. despatch riders and their machines in the advance and retreat from Serbia were put to what is perhaps the most severe test ever yet imposed upon this section of the Army. That they surmounted such trying conditions is a credit to both riders and machines.

## Ladies' Riding Apparel.

Among the features of this issue is an article by our lady contributor Miss May Walker on the absorbing question of dress for lady motor cyclists. Striking illustrations accompany it.

## Support for our Spring Frame Campaign.

Another design of spring frame, by a leading maker is shown in an illustration this week. It is the Royal Ruby which we announced last autumn. Last week we inspected another design which was under test on the road, and particulars will appear shortly.

## America's New Type Cycle Cars.

America has produced an entirely new breed of cycle car. The Yankee notion is a miniature racing car, even the wheels being of proportionate size, the power plant being an air-cooled motor cycle engine and gear box. A series of designs appeared in our issue of June 17th last, but the very latest, a most attractive little runabout, is illustrated on page 118.

## More Free Dimming Discs.

Messrs. Joseph Lucas, Ltd., Great King Street, Birmingham, are prepared to present to users of Lucas lamps perforated discs which meet the requirements of the new Lighting Order in those districts where Part III. applies. The discs are of three sizes—4½ in., 5½ in., and 5½ in.

We have received from Messrs. C. A. Vandervell and Co., Ltd., two perforated cardboard discs, which are to be distributed free to users of C.A.V. G.C. or B.C. side lamps or motor cycle head lamps.

## Waiting List of Despatch Riders.

For the information of enquirers respecting positions in the Royal Engineers as despatch riders, we notice from particulars in our possession that practically every district committee's waiting list is up to the strength allowed by the Central Office. As soon as R.E. recruits are wanted, an announcement to that effect will appear in these columns as heretofore.

## Motor Cyclists' "Through Routes."

Our best thanks to those readers who have so kindly offered to check the routes in certain districts which appear in the new edition of *The Motor Cycle Route Book*. Proofs of the routes have now been issued to readers who have a special knowledge of the roads in certain districts, and by this means of double checking with "local" knowledge, our publishers will be able to produce a book in which the routes given are not only correct, but are the best from a motor cyclist's view-point.

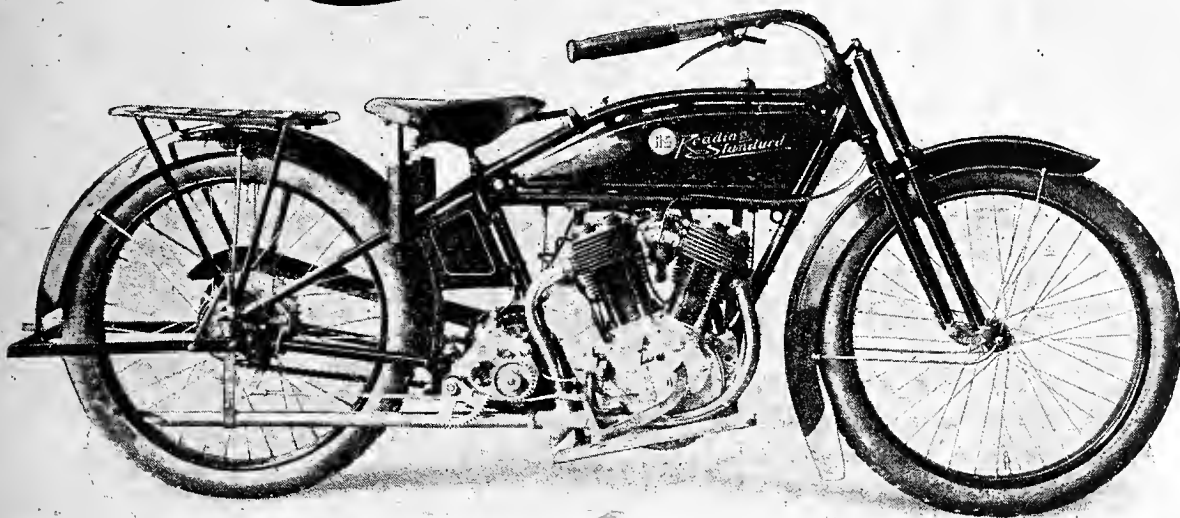
## Ulster Centre Annual Meeting.

The Ulster Centre of the Motor Cycle Union of Ireland held its annual general meeting on Friday evening at the Grand Central Hotel, Belfast, combining the business proceedings with a smoking concert. The chair was occupied by Mr. R. G. Lindsay, the president. The report of the committee showed that, owing to the war and the condition of affairs generally at home, the activity of the Union was greatly curtailed, but, nevertheless a restricted programme of events was carried out. The chief of these was the Irish End-to-end two days trial, and although shorn of a good deal of its erstwhile interest by reason of the absence of the usual cross-Channel competitors, it proved a very successful event. The report gave prominence to the fact that more than half of the members of the committee were serving in the Army. The names of sixty were given in the report, and it was mentioned during the evening that thirty of them now had commissions. The financial statement was satisfactory, despite a substantial fall in the revenue. The committee was able to adjust its expenses to the existing conditions, and closed the year with a substantially increased credit balance. Both reports were adopted. The election of officers results in Mr. R. G. Lindsay being made president for the sixth time. The other officers elected were as under: Hon. treas., R. McCann, and hon. sec., J. J. Kennedy. Although the meeting gave no directions to the incoming committee on the subject of competitions, it is understood from the speeches that a restricted programme on the lines of those of last year will be carried out, including, of course, the classic Irish event—the End-to-end trial.



A STAFFORDSHIRE SCENE. Sunset on Rudyard Lake.

# Reading Standard



## Introducing — A Motor Cycle of the Highest Class Attainable.

**T**HE NEW MODEL "READING - STANDARD" FOR 1916 has earned the enthusiastic admiration of all who have seen and tried it. It embodies more real improvements and refinements than any other motor cycle. It gives great speed, great flexibility, most power, and least trouble. It is the crowning achievement of twelve years' practical experience by us in the highest class motor cycle manufacture. No better machine has ever been produced in any factory. We invite tests and comparison to prove the absolute truth of these statements.

### **NOTE these Points in the Specification of the New R-S:**

Three-speed sliding gear, with double locking device. Large multiple disc clutch, foot and hand operated. Large valve area. Motor positively oil-tight. Mechanical oiler, plunger type, driven by worm shaft, also hand pump. Step starter. New front fork (with double fork sides). New R-S "Perfection" seat pillar giving absolute comfort and entire immunity from road shocks. Heavy and reinforced tubing throughout the frame. Integral cam gear, *i.e.* gear, shaft and cams all in one piece, turned from solid bar. (Cams and gears are made of properly treated Vanadium steel.) Side-by-side valves. Powerful foot brake.

The R-S is manufactured throughout in one up-to-date factory. We give one year's guarantee. **SERVICE BUILT INTO EVERY DETAIL.** A Catalogue awaits your enquiry.

**The READING-STANDARD Motor Cycle Co.,**

28 & 29, BAKER STREET, PORTMAN SQUARE, - - - - - LONDON, W.

Telegrams: Clairmat, London.

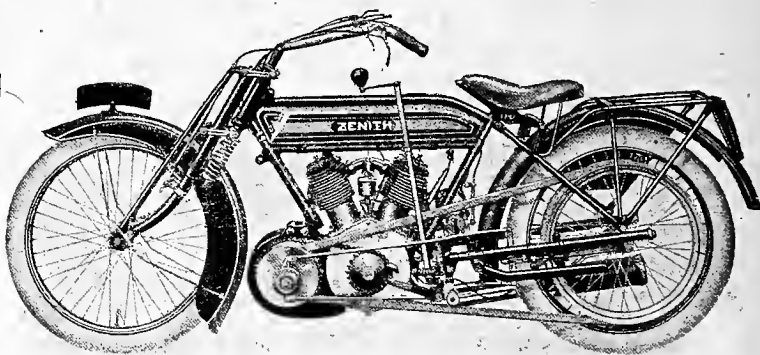
Telephones: 508 and 563, Mayfair.



# IF YOU LIKE to hear a "click" as you change gear you don't want a **ZENITH**



The Infinitely Variable GRADUA GEAR is quite silent in operation, whilst possessing the even greater merit of permitting the engine to turn at a uniform rate (the speed at which it can most efficiently work). This represents a big saving of wear in all the working parts, belt and tyres.



Our Catalogue awaits your request.  
Models from  $3\frac{1}{2}$  to 8 h.p.  
**ZENITH MOTORS, Ltd.,**  
HAMPTON COURT, ENG.

THE BELT FOR RUDGE, ZENITH, PHILIPSON,  
GRADO. BRAMPTON, or ANY GRADUAL GEAR.



The BELT that is breaking ALL RECORDS

## — ECONOMY —

BY INCREASING EFFICIENCY WE REDUCE YOUR  
PETROL BILL TO THE PRE-BUDGET RATE.

Now is the time you require an

## ALL-WEATHER BELT

THEREFORE WRITE US NOW AND

**SAVE MONEY.**

## SPECIAL OFFER.

$\frac{7}{8}$ "	1"	$1\frac{1}{8}$ "	$1\frac{1}{4}$ "	USUAL PRICE for 8ft.
28/-	30/-	34/-	36/-	
21/-	22/-	23/-	24/-	SPECIAL PRICE for any length up to 8ft.

The **ZILLA PATENT BELT COMPANY, Ltd.,**  
101, Great Western Street, MANCHESTER.

THE BEST



Reliability  
OF THE

## RICH

**DETACHABLE  
Tubes & Covers**

4,500 miles on a RICH Tube without using the pump. This absolutely un-solicited testimonial can be seen with a thousand others, at our office; also hundreds of ends of all other makes — British and Foreign — with the opinion of the riders.

EARTH

GUARANTEED AIR-TIGHT, with Free Air Passage.  
PRICES:

	24in. or 26in.	28in.
1½in. ....	8/-	9/-
2in. ....	11/-	12/-
2½in. ....	12/-	13/6
2¾in. ....	13/-	14/6
2½in., 650 X 65	14/6	16/6
3in. ....	20/-	23/-
3½in. ....	26/-	30/-

PEDAL CYCLE, 26 or 28in., 1½, 2½, 1½, 6/-.

Not sold under the above prices.

Cyclists' own tubes fitted with Detachable Joint. 1½, 2/3, 2 5/-, 2½ 5/-, 2¾ 6/-, 3, 7/-, 3½ n., 8/-.

Pedal Cycle, 1/6.

Always send size of Cover.

Write for Booklet.

The **Thames Rubber & Leather Co.**  
199, Up. Thames St., London, E.C.

Testimonial.

Gentlemen, Highgate. Please send me a Rich Tube. I must mention the one I tried and have in use since 1911 is still acting splendidly, and I am now transferring the present one to the front and fitting a new one to the back. They are a boon.

**The Air Raid.**

At the time of the air raid in the Midlands on Monday night, several motor cyclists and quite a lot of cars and lorries were on the roads, but they were held up by the police authorities.

**Mentioned in Despatches.**

Among the list of those mentioned in despatches in Sir Ian Hamilton's report we notice the names of Temp. Lt. C. Patteson, and motor cyclists, Royal Engineers Special Reserve of Officers, Temp. Lts. F. H. Woodrow and C. L. Mason.

**Average Prices.**

We give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted. If there were not at least two advertisements, then the last average obtainable is given.

Make.	Year.	H.P.	Average for last week.	Latest weekly average obtainable
A.J.S.	1915	6 3-sp. sidecar	—	£82
"	1914	6 3-sp. sidecar	—	£71
"	1913	6 3-sp. sidecar	—	£57
"	1915	2 3-speed	—	£51
Allan	1915	2 3-speed	£36	—
Ariel	1914	3 3-sp. sidecar	—	£53
Bradbury	1914	4 3-sp. sidecar	£41	—
B.S.A.	1915	4 3-sp. sidecar	£74	—
"	1914	4 3-sp. sidecar	£51	—
"	1913	4 3-sp. sidecar	£53	—
"	1913	2 2-speed	£49	—
Calthorpe	1913	2 2-speed	—	£31
"	1915	2 2-speed	£18	—
Clyno	1914	6 3-sp. sidecar	—	£66
"	1913	6 3-sp. sidecar	—	£50
Douglas	1915	2 2-speed	£43	—
"	1914	2 2-sp. kick start	£38	—
"	1914	2 2-speed T.T.	£38	—
"	1913	2 2-sp. kick start	£35	—
"	1913	2 2-speed T.T.	—	£31
"	1913	2 2-speed	—	£34
Enfield	1915	6 2-sp. sidecar	£73	—
"	1914	6 2-sp. sidecar	—	£60
"	1913	6 2-sp. sidecar	—	£47
"	1915	3 2-speed	£43	—
"	1914	3 2-speed	—	£37
A. Excelsior	1914	7 2-sp. sidecar	—	£55
H.-Davidson	1915	7 3-sp. sidecar	—	£75
Indian	1915	7 3-sp. sidecar	—	£78
"	1914	7 2-sp. sidecar	—	£55
"	1915	7 3-speed	—	£63
"	1915	5 3-speed	£48	—
"	1914	7 T.T., free eng.	—	£44
James	1915	4 3-sp. sidecar	£60	—
Lea-Francis	1915	3 3-speed	—	£63
Levis	1915	2 1/2 "Popular"	—	£25
Matchless	1915	8 3-sp. sidecar	—	£80
"	1914	8 2-sp. sidecar	—	£70
"	1913	8 2-sp. sidecar	—	£53
New Hudson	1915	6 3-sp. sidecar	—	£61
"	1915	2 2-speed	—	£30
New Imperial	1915	2 2-speed	—	£30
"	1914	2 2-speed	£25	—
O.K.	1915	2-speed	—	£24
"	1914	2-speed	—	£21
P. & M.	1913	3 2-sp. sidecar	£43	—
Premier	1914	3 3-sp. sidecar	£48	—
"	1913	3 2-sp. sidecar	£32	—
Rex	1914	6 2-sp. sidecar	£45	—
Rover	1915	3 3-sp. sidecar	—	£61
"	1914	3 3-sp. sidecar	£43	—
"	1913	3 3-sp. sidecar	£40	—
Rudge	1914	5-6 Multi sidecar	—	£41
"	1915	3 3 Multi	—	£47
"	1914	3 3 Multi	—	£37
"	1913	3 3 Multi	—	£29
"	1914	3 3 Multi sidecar	—	£47
Scott	1914	3 2-sp. sidecar	£55	—
"	1913	3 2-sp. sidecar	—	£48
Sunbeam	1915	6 3-sp. sidecar	—	£66
"	1914	6 3-sp. sidecar	—	£60
"	1915	3 3-speed	—	£63
"	1914	3 3-speed	—	£52
Triumph	1914	4 3-sp. sidecar	—	£53
"	1914	4 3-speed	£44	—
"	1913	3-sp. sidecar	£46	—
"	1913	3-speed	£36	—
Williamson	1914	8 2-sp. sidecar	£63	—
"	1913	8 2-sp. sidecar	—	£55
Zenith	1914	8 Gradua sidecar	—	£67
"	1914	6 Gradua sidecar	—	£56

**Ford Yarns.**

Wherever motor cyclists congregate it is quite the usual thing for members of the party to tell funny stories of Ford cars. It is not fair to confine these yarns to club circles, and we offer a set of three handbooks (motor car or motor cycle) for the best Ford story which is forwarded to us for publication. Here's a chance for the hundreds of readers in the trenches!

**The Junior Automobile Club.**

The above is the new title that is proposed for the body hitherto known as the Cyclecar Club. As a matter of fact, a Junior A.C. was formed as long ago as 1907 by Mr. C. W. Brown, but it has been practically dormant since its birth, hence its sponsors are willing for the title to be transferred to the present Cyclecar Club. This decision was arrived at at the annual meeting of the Cyclecar Club held on Friday last.

**O. C. Godfrey Learns to Fly.**

O. C. Godfrey expects shortly to be gazetted as Sec.-Lt. in the Royal Flying Corps. He obtained his ticket on January 12th, having begun to learn to fly on November 2nd. As a matter of fact, he was ready for his examination long before, but was unable to fly for his certificate owing to the bad weather. He learnt on a Wright machine, which, he says, is a particularly unstable aeroplane. It has no inherent stability, and, therefore, has to be controlled the whole time, consequently the pupil receives much instruction while flying. Asked if he found motor cycling of any value to him in learning to fly, Mr. Godfrey replied in the negative, and said he thought any young man with ordinary intelligence could learn to fly in a comparatively short time.

**In Aid of the Italian Wounded.**

Riders of Douglas motor cycles are attached to the First British Ambulance and Hospital Unit at the Italian front. The ambulances have carried over 20,000 sick and wounded and covered over 117,000 kilometres in seventeen weeks.

**The National Relief Funds.**

At the week-end the principal war funds stood as follows:

The Prince of Wales's National Relief Fund (£2,893,000 distributed)	£5,736,293	0	0
Tobacco Fund	97,849	0	0
Fund for the Sick and Wounded	3,123,863	0	0
The Queen's Work for Women Fund	168,330	4	9
Polish Victims' Relief Fund	97,691	14	3

**Russian Honour for British Despatch Rider.**

Corporal Gaze, despatch rider, R.E., has been presented with the St. George Medal from the Tsar for gallantry at the second battle of Ypres. In getting through to Hill 60 with important despatches he was badly wounded, and his comrade had his leg blown off. He managed, however, to deliver the message and then returned to his comrade, but was again seriously wounded, and lay all night before being discovered.

**Damages for a Sidecar Accident.**

£650 damages were awarded to Mr. J. T. Gardner in the King's Bench recently in a case against the Splidtdorf Electrical Co. It appears that in February last he purchased a second-hand motor cycle and sidecar, but never having driven a machine before he was unwilling to make his first attempt through the London traffic. The firm, therefore, directed an employee to drive him to his home at Harrow. On the way a collision occurred with a taxicab, and Mr. Gardner was so seriously injured that he had to have one of his legs amputated. The jury found that the accident was due to negligence.



A THOUGHTFUL ACT WHICH MIGHT BE COPIED.

The owner of this Matchless outfit overtook the two soldiers and a woman walking to a country station, one of the men being trenchward bound after seven days' leave. The sidecar owner insisted upon taking the three the remainder of the journey, a distance of two and a half miles, greatly to their joy.



# SPRING FRAMES—IDEAL AND REAL.

By An Amateur Designer.

**A**LTHOUGH the movement in favour of spring frames initiated by *The Motor Cycle* has set many inventive minds to work, it may be questioned whether the numerous designers, amateur and otherwise, who are attacking the problem have a definite idea of the object to be achieved and the choice of methods available for attaining the end in view. No doubt it is understood in a general kind of way that you have to protect the rider and motor cycle from road shocks, and that you do this by providing a few springs somewhere near the back wheel, but one wonders whether in many cases there is any more precise intention than this.

It is really not very difficult to make out a list of the qualities that a spring frame ought and ought not to have. A further list can next be prepared showing the various possible combinations of springs, links, etc., by which the back wheel can be supported, and all that then remains is to select the particular combination that possesses the greatest number of desirable qualities, and the least number of undesirable ones. If the winning scheme is not exactly the ideal springing device, at any rate it will be as near to it as we can hope to get.

Of course, we all know that the problem is not quite so simple as that, but is it unreasonable to suggest that some such procedure should be followed as far as possible in dealing with a question of this kind? All manner of differences of opinion are likely to arise as to the relative merits of various devices, and as to what are, and what are not, "possible combinations." Still, criticism of the schemes put forward will be much more valuable if it proceeds along definite lines, and hence the best possible solution of the problem is likely to be reached all the sooner. For example, it serves no sort of purpose to criticise a particular design because it looks as though it wouldn't be a success; on the other hand, if it is pointed out that the design would fail because, say, it would quickly allow the wheel to get out of alignment, or because the wrong kind of springs are used, then the challenge can be taken up on a clear issue, and there is some prospect of deciding whether or not the criticism is justified.

## The Ideal.

The utmost that can be said about the best device in its "paper" stage is that it is *likely* to be a success on the road: the road test is fairly certain to reveal unsuspected weak points, which can be noted in our list of "what to avoid," thus imposing still further restrictions on future designs.

To apply this systematic method of procedure to the present question, we have first to decide exactly what we expect from a rear-sprung motor cycle, *i.e.*, what are the chief items on the "desirable" side. Our aim may be expressed in many different forms, but it will probably be agreed that an *ideal* spring frame would fulfil the following condition. Assuming the motor cycle to be travelling along a road nominally level, then the rider and machine should move truly horizontally, without rising or falling in the slightest degree, no matter what humps or hollows in the road

surface the wheel encountered. When a pot-hole is traversed, the wheel must drop into the hole, but in doing so must not lower the frame or the rider; similarly the wheel must rise over an obstruction without raising the rider.

In short, the rider of an ideally-sprung motor cycle would be unable to tell from the motion of his machine whether the road he was traversing was like a billiard table or like—well, any well-worn motor 'bus route. Obviously this is one of those ideals that cannot be realised, so we must be content with stipulating that the rider is disturbed as little as possible, and that whatever vertical displacements are impressed on him (to use the language of mechanics) they are brought about with as little shock as possible.

## Pros and Cons.

Although the comfort of the rider is the first consideration, if the motor cycle itself can be made to share the freedom from road shocks that we are endeavouring to secure for the rider so much the better, and any springing device will be the more valuable according to the proportion of the total weight that is sprung, *i.e.*, the unsprung weight should be as small as possible. Quite a number of other desiderata could be brought forward, but most of these might more accurately be described as absence of undesirable features, and so should be classed among the negative characteristics.

There are so many attributes that the rear springing system must *not* have that it is difficult to know where to begin. However, a few of the more important ones can be mentioned, and the reader can complete the list to suit his taste.

(1.) There must be no tendency—or as little as possible—to "bouncing." When the springs have yielded, due to inequalities in the road surface, they should regain their normal position without undue rebound.

(2.) The back wheel must not be thrown out of alignment under any loads that are likely to be put on the machine, even when the links and pins of the pivoted members, or their equivalents, become worn.

(3.) The vertical movement of the wheel, relatively to the frame, must not strain the transmission in any way. This means that the distance between the centres of the countershaft and of the back wheel must remain unaltered.

(4.) The device should not add materially to the weight of the machine.

All these points are fairly obvious ones; nevertheless they cannot be too clearly borne in mind if a successful result is to be achieved.

## Leaf or Coil Springs.

As for the next step in the evolution of a successful springing gear—the compilation of a list of *all* the available combinations of springs, links, etc.—we are here confronted by an impossible task. To examine in detail even the suggestions that have been described in this journal would be out of the question; to select a particular example would be invidious, but it may be permissible to discuss one

**Spring Frames—Ideal and Real.—**

or two general types—for example, those employing leaf or plate springs and those using coil or helical (so-called "spiral") springs.

The main positive property that is demanded of the design practically amounts to a capacity for giving satisfaction on the road, and hence can only be decided by a road test. As regards the negative qualities, the leaf type of spring certainly has the advantage over the coil spring in the first item on the list, for the latter type is much more prone to give rise to bouncing than the former. When a plate spring deflects, the ends of the individual leaves move relatively to one another, and a reverse motion takes place when the spring regains its normal position. The friction between the plates offers a greater or less resistance to this relative movement, and hence has a material effect in damping down undesirable oscillations. Coil springs have no such damping action.

Points 2 and 3 depend more upon the method of applying the springs than upon the springs themselves, but, judged by condition 4, the advantage lies with the coil type. For a given load and deflection a coil spring can be made considerably lighter than a leaf spring, though it does not necessarily follow from this that the weight of the complete springing arrangement will be less.

**The Real.**

Perhaps a little further explanation of condition 2 is necessary, as it is from this point of view that many of the designs so far published appear to be defective. If the rear sprung motor cycle is to be used for side-car work—and presumably all machines of the class we are considering are built with this object in view

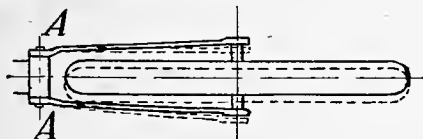


Fig. 1.

—the rear wheel will often be called upon to withstand the severe horizontal *side* thrust that is set up when the vehicle is cornering—a thrust that may in extreme cases amount to one-sixth or one-fifth of the total weight of the combination and its passengers. It will at once be recognised how easily a system of link work, designed primarily to sustain a vertical load, could be seriously distorted by a horizontal force of this nature. Take the case of machines having pivoted chain stays: the tendency of the side thrust is to force the wheel over as shown by the dotted lines in fig. 1, and consequently completely to destroy the alignment. (In this diagram the motor cycle is supposed to be viewed in plan.) To resist this tendency it is clear that the pivoted connections A between the stays and the frame must be very robustly designed, and preferably the system should be stiffened by interconnecting the inner ends of the stays. Even if the arrangement is sufficiently rigid when the joints are new, evidently any great amount of wear will allow the wheel to get out of line.

It happens that leaf springs are admirably adapted for withstanding this side thrust, but curiously enough they are usually placed where their advantages in this direction are thrown away, *i.e.*, some distance above

the centre of the wheel, instead of *at* the centre. Consequently the tendency of the side load is to twist the wheel over as shown in fig. 2; this diagram represents a rear view of the motor cycle, SS being the springs, and P the direction of the thrust. No doubt the designers who favour this method make suitable provision for preventing such distortion, but, as before explained, it is impossible to maintain the alignment of the wheel when serious wear develops in the pivots.

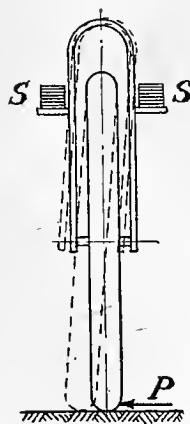


Fig. 2.

**A Suggested Arrangement.**

A suggestion for completely eliminating this possibility is indicated diagrammatically in fig. 3. It will be observed that the pivoted chain stays are replaced by a second pair of leaf springs

B, and as the arched member C is hence restrained from sideways movement, both at its connections with springs A and springs B, this member will have a truly vertical movement under all conditions, and so, therefore, will the wheel which is attached to it. The only wearing parts of the gear are the connections between the arched member C and the ends of the springs, and even if wear does occur at these points it cannot affect the alignment in any way.

Besides possessing, in common with all devices employing leaf springs, the advantage of absence of rebound, the arrangement shown in fig. 3 has the further point in its favour that the springing is adjustable. By screwing up the nuts D to suit the load on the machine, the ground clearance can be maintained constant irrespective of the weight and number of passengers.

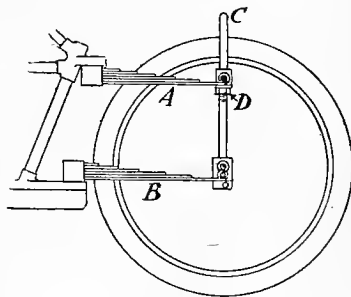


Fig. 3.

No doubt it would not be an easy task to design a transmission to suit such a system of springing, but it would be interesting to hear whether all the objections that could be urged against the design would be such as to deprive it of all chance of success in a practical test. In conclusion, it may be noted that if the upper springs A (fig. 3) be removed, we are left with the simple method of suspension common in three-wheeled cycle cars. Perhaps some reader will point out whether or not this method has been tried on a motor cycle; if so, with what success, and, if not, why it should not give satisfactory results. Such an arrangement has obvious advantages from the point of view of cheapness and simplicity, and the only defect that is revealed by a cursory glance is the possibility of the wheel canting, as shown in fig. 2. In cycle cars this possibility can be guarded against by spacing the springs well apart, but this could not conveniently be done on a motor cycle.

# Developments in the American Motor Cycle World.

Mr. W. H. Wells recounts Impressions gained on his Latest Visit to the U.S.A.

**W**E recently had a chat with Mr. W. H. Wells, who has lately returned from a short visit to the Hendee headquarters in Springfield, Massachusetts. Asked about the present condition of the motor cycle industry in the United States, Mr. Wells stated that the demand for motor cycles and cars was as great as ever, but the difficulty was a shortage of material, which was almost as bad as it was in Great Britain, owing to the very large quantities required for munitions for the Allies.

We then asked Mr. Wells if there were any indications of the American manufacturers devoting their attention to the medium-powered machine. The answer was in the negative; and he went on to say that there seemed to be a good prospect of the lightweight attaining a certain degree of popularity for use in districts where the roads were good, but that the medium-powered machine was simply non-existent. In his particular

case, the 5 h.p. model Indian, which has met with so great a success over here, is not sold at all in the United States. For the coming season 1,000 Indian two-strokes were laid down, but, owing to the demand being much greater than had been previously anticipated, provision had been made for the building of an additional 2,000. It is interesting to note that all the Indian two-strokes, for use both over here and in America, will be fitted with Amac carburettors. Altogether, the Hendee Co. hope to turn out 50,000 motor cycles this year, provided the necessary material can be delivered.

## Aluminium Pistons.

One of the materials in which there is certainly a great shortage is aluminium, but, fortunately, the Hendee Co. have a heavy stock to fall back upon. Mr. Wells then went on to make the interesting statement that he thought that the piston of the future would be made of die-stamped aluminium. Such pistons

were already used successfully on the twelve-cylinder Packard car. He also stated that carbon deposit does not adhere to the tops of these pistons to the same degree as on ordinary pistons. [Articles in *The Motor Cycle* have emphasised these points.—Ed.]

## Roads Improving.

We interrogated Mr. Wells concerning the condition of the roads in the United States. He assured us that the making of good roads was progressing by leaps and bounds, and the reason for this was that the necessity for well-kept highways had been forced upon the authorities by the enormous increase of the use of motor vehicles, with the result that many miles of Tarmac highways are now being laid down. The great Lincoln highway, which is to extend right across the continent, is rapidly approaching completion, and when this is finished it will indeed be worth travelling over.

# Recruiting Section.

R.F.C. Recruiting. Groups Over No. 13 Now Open for all Trades.

**F**OR two successive weeks we have dealt with the new scheme of the Royal Flying Corps in the matter of recruiting, and last week we were invited to inspect the lorries upon which are mounted the electrically-driven lathe, drill, grinder, etc., used for trade-testing the men who offer themselves for service.

A further change to be noted in the recruiting scheme is that attested men in groups over 13 may now offer themselves for all R.F.C. trades. Last week men in groups 6 to 9 were being examined

as to their special proficiency in various kinds of work.

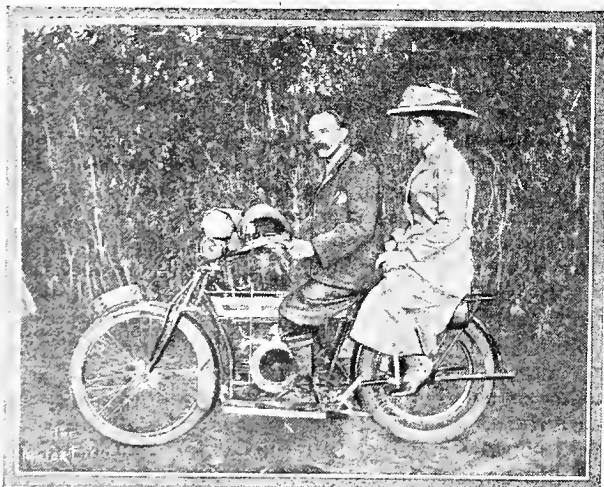
Special recruiting parties to test the men are, we are informed, stationed at Woolwich, Chelsea, Leeds, Birmingham, Manchester, Edinburgh, and all necessary particulars may be obtained from local Recruiting Offices.

P. and M. motor bicycles are attached to each section, on which motor cyclists are invited to exhibit their riding abilities, and are afterwards tested in their knowledge of the mechanism. It is not sufficient to be a mere rider of a

motor bicycle, and know nothing whatever of its working.

The other trades which are open include fitters, car drivers, instrument repairers, coppersmiths, sail makers, and storemen with a knowledge of engine parts.

The pay in each case is 2s. per day. Should readers of any of the above named trades be unable to obtain particulars at their local Recruiting Offices, they may apply direct to Sec.-Lt. Goode, Officer in Charge, R.F.C. Party, Curzon Hall, Birmingham.



A MOTOR CYCLIST MISSIONARY IN THE JUNGLE.

The Rev. Rowling and his wife, who have toured extensively on their Douglas in Uganda, British East Africa, in the manner shown. Motor cyclist missionaries have very exciting times in B.E.A., but they are not regularly chased by lions and leopards as is popularly supposed!

## DON'T FORGET HOW TO STOP.

**I**T is always advisable, when riding a strange machine for the first time, to make sure exactly how the various levers work, and also that they do work. It is most important to know how to stop the machine quickly, if necessary, in an emergency. A member of our staff had a most exciting time recently when taking delivery of a second-hand two-cylinder two-stroke, the control of which was by throttle and half compression valve only. When trying the machine on the stand no difficulty was experienced in stopping the engine by shutting the throttle, the release valve only having

the effect of slightly reducing the power on this particular machine. However, upon making a running start the machine went off at a smart pace, and refused to be governed by the throttle at all. The road, which, fortunately, ran across a common, had several very sharp bends in it, the first having to be negotiated shortly after mounting. Shutting the throttle had no effect; the same result attended the lifting of the release valve. The speed was too great to attempt to negotiate the corner, so a somewhat bumpy ride over a portion of the common was the only alternative, a fall due to side-slip on the brink of a deep ditch eventually solving the problem of how to stop. After this experience a magneto cut-out was fitted.

## COMPETITIONS IN WAR TIME.

We notice that the old competition controversy is being revived. Every extra day the war lasts should render less likely the possibility of holding ordinary competitions, but an occasional event for service men might well be arranged in the summer.

## Britain's Petrol Supply.

A Doubtful Shortage. Opinions of Leading Suppliers.

**Q**UITE recently the Shell Petrol Co. announced that owing to a shortage in spirit some delay might ensue in the delivery of future supplies. This despite the fact that imports for 1915 constituted an easy record, totalling 144,939,700 gallons. We heralded the news as the first hint of an increase in price. We have made it our duty to enquire among some of the leading firms of petrol importers, and gather from them as a whole that there is an ample amount of spirit for present requirements. The increase of price is, they admit generally, due to the shortage of ships which deliver the spirit from the country of its origin to Great Britain and the increased freight charges. When questioned about the present cost, the representative of one firm mentioned to us that it was a considerable surprise to him that the price of petrol had not been put up earlier.

Anyhow, the position at present is this, that the price of petrol has increased, and certainly will not cost the unfortunate motorist any less in the future, while there is a very distinct prospect of its going up. Not, however, for some time to come, but eventually. At the present moment there certainly seems to be enough petrol in the country, but as the result of our enquiries we have been led to suppose that if things go on as they are it is just possible that there may be a shortage in the future. Below we give the views of some of the representatives of the principal firms of petrol importers in Great Britain.

**PRATT'S MOTOR SPIRIT SUPPLIES.**—In regard to the recently issued notice from the Shell Co. as to the possibility of a shortage of petrol, the Anglo-American Oil Co. say: "So far as we are concerned there is no shortage of spirit. We are taking care of very large

requirements for the Expeditionary Forces and the Admiralty, and, in addition, all the normal requirements of our commercial consumers and garage trade. It is much to be regretted that an unnecessary panicky statement as to the condition of the market should have been issued; it only has the tendency to bring about the very situation that should have been avoided. So far as this company is concerned, we are no parties to it."

**THE GAS LIGHTING IMPROVEMENT CO., LTD.,** Salisbury House, London Wall, E.C.—This company state that they have ample supplies of their three grades of motor spirit—Carburine, Carburine No. 2, and Glico motor spirit.

**CARLESS, CAPEL AND LEONARD,** Hackney Wick, N.E.—As far as this firm is concerned, there is enough petrol to supply the needs of its ordinary customers.

## A Paraffin Motor "Omnibus."

The Limit in Freak Machines.

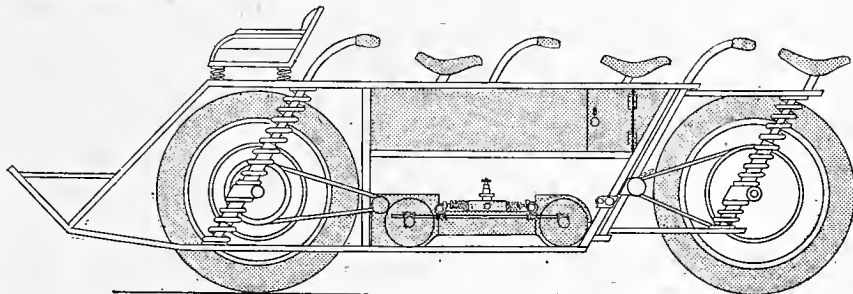
**T**HE machine illustrated is the outcome of a commission given to a Mr. J. Forrest Walters, B.A., C.E., of Stanley Road, Teddington, to produce a vehicle for the rapid transport of large bodies of men with the utmost economy. If successful, the machine will, we are told, form part of the outfit of American railroad contractors.

The power unit is a two-cylinder water-cooled paraffin motor having four pistons, making it equivalent to four cylinders of 70 mm. bore x 80 mm. stroke. There are two crankshafts, which are coupled together by means of a rod having a right and left worm gear; this rod, also by worm gear, will drive the camshaft, magneto, and water cooling pumps. The drive is by belt to the front wheel, the rear wheel being the steerer. Both

wheels are sprung, and fitted with band brakes and 4in. section tyres.

A double frame will be used, and seating accommodation is provided for four

persons, while the wheelbase, we are told, is only twelve inches longer than that of the average present motor cycle, i.e., about 66in.



A quaint design for a four-seated motor cycle evolved by J. Forrest Walters.

## The Annual General Meeting of the M.C.C.

Possibility of the Opening Run to Brighton being held.

**C**ONSIDERING the abnormal circumstances obtaining at the present time the annual general meeting of the Motor Cycling Club which was held last week at the Café Monico, Piccadilly, was quite well attended. The chair was occupied by Mr. S. H. Fry, a founder member of the M.C.C. In consequence of the war the club remained comparatively inactive during last year. The report was read and adopted, and also the balance sheet, practically without discussion. It was then decided that the officers and committee of the club should be re-elected *en bloc*.

Mr. W. H. Wells suggested the continuing of the opening run, and it was finally decided that the advisability of holding this popular function should be left in the hands of the committee.

### Members on Active Service.

In the course of the proceedings Mr. R. H. Head, chairman of the Club Committee, mentioned that 149 members had been officially noted as having joined His Majesty's Forces, while it was known that a large number of others who could not be traced had also joined up, this probably meaning that at least 250 were serving either in the Navy or Army, which he considered to be a record for any motor cycling club. It was decided that the subscription should be 5s., as was the case last year. Mr. Head thanked the committee for the efficient attention they had given to the affairs of the club during a very trying time, and it was mentioned that of the committee Messrs. Karslake, Clark, Edwards, Southcombe May (honorary secretary), and Baddeley had joined the Forces.

During the absence of Mr. May the work of honorary treasurer and honorary secretary is being ably carried on by Mr. L. G. Funnell, for whose services a very hearty vote of thanks was passed. The proceedings terminated with a vote of thanks to the chairman.

### THE DARKENED STREETS.

The Home Secretary has stated that in view of the reduction of street lighting the Commissioner of Police has given special attention to the increased risks to pedestrians at congested crossings. The use of red or green lamps at dangerous crossings would lead to confusion without securing further safety, and a speed limit of 4 m.p.h. at such places could not be enforced owing to the difficulty of proof.



# MILITARY NOTES.

## DESPATCH RIDERS' EXPERIENCES IN MACEDONIA.

### VALUABLE EXPERIENCE GAINED ON ACTIVE SERVICE.

WE have received a letter from a staff-sergeant in a repair works belonging to the Royal Marine Artillery somewhere in France. He writes: "I am employed on mechanical transport work as a motor mechanic, and have been in France since February last. I was employed as mechanic in charge of the Midland Motor Co.'s workshops at Oxford before the war, and I can tell anyone engaged in the trade that Active Service teaches one more in a month than English roads teach in a lifetime. *The Motor Cycle* is obtainable every week in a town close by, so you will see we are not badly off!"

Among overseas letters last week was one from Sgt. A. J. Sproston, who, writing from Alexandria, Egypt, appears to be in the best of spirits.

The 3 h.p. Enfield reproduced on page 72 of our last issue belongs to M. Rouchy, a Belgian despatch rider, who is shown in the saddle. He speaks highly of the running of his machine under service conditions. It is one of a number of Enfields in the Belgian Army.

### THE SUPREME TEST. THE MOTOR CYCLE MAKES GOOD IN THE BALKANS.

THAT the motor cyclist despatch rider has proved capable of surmounting undreamed of difficulties in Serbia and Macedonia is borne out by a letter we have received from Despatch Rider T. G. Quinney. The letter makes such good and instructive reading that we reproduce it in full herewith:

"As a motor cyclist despatch rider it was with great interest I read references to the use of motor cycles in Macedonia in your issue of December 30th. I am in one of the divisions that effected the new landing at Suvla Bay (Gallipoli), and I can vouch for the fact

that we continually used motor cycles there after the first fortnight. We had a mixture of Triumphs and Douglasses, and used these for the rest of our stay and got complete satisfaction from them.

"From Suvla Bay we were taken to Salonica, and were the first division to land there. We took our machines with us, although they were fast falling into the 'old creak' stage as spares were at a premium. While we were in Salonica we got issued with new Douglasses, and shortly after this we moved up into Serbia. This is where the real test began, as the Serbian roads are hopeless. Nevertheless we still carried on. It was more like trick riding than motor cycling, as it was impossible to get a level road for more than a hundred yards. The so-called road would dip for several feet, and these hollows were full of rough cobbles. You can imagine what one felt like after a ride of twenty miles on a road like this. Everything that could shed itself came from the machines. The meagre stock of spares was soon exhausted, and we had to dismantle one good machine to get parts for the others. We used our motor cycles throughout the whole of the operations in this part and under all conditions.

"During the retreat from Serbia the machines came in for an especially trying time, as all wires were cut and despatch riding was the only means of communication. It was a great test, but the machines stood it remarkably well, and we finished up by riding along the railway track from Doiran to Salonica. This was the best ride we had.

"Now that we are back again in Salonica we are getting a rest, although there is still plenty of work to do. What with the D.R.'s of the other divisions, you can hardly go anywhere but you meet a Douglas or Triumph plodding along. I think all the D.R.'s in this part will agree with me when I say that no sort of weather makes any difference, and as long as there is a road or a mule track we get there. I wish *The Motor Cycle* every success."

### M.M.G.S. CASUALTIES.

IN a recent casualty list we notice the name of Lt. W. C. Strain, M.M.G.S., wounded, and among the list of officers in the Canadian contingent wounded, Capt. J. E. Browne, No. 1 Motor Machine Gun Battery.

### WITH THE CANADIAN M.M.G.S.

WITH so much attention focussed on the Motor Machine Gun Section, of which the editor of *The Motor Cycle* is recruiting officer, the existence of a similar section attached to the Canadian Expeditionary Force, now in France, is likely to be overlooked. Like their English comrades, the Canadians of the M.M.G.S. at present use their

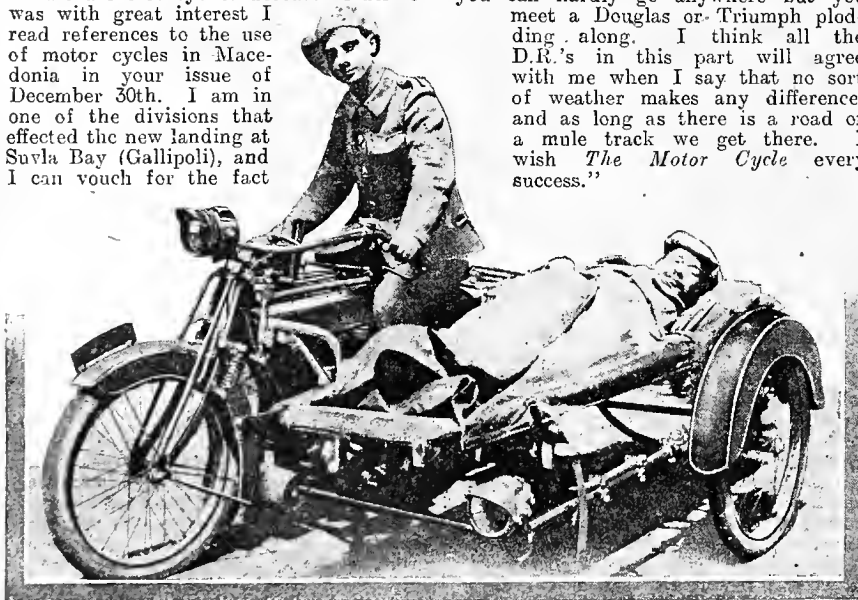


Air mechanic H. E. Godfrey, R.N.A.S., who, as a member of the North Middlesex and North-West London clubs, took part in many competitions in the good days of the pre-war period.

machines but little for the work they are primarily intended. However, they are all ready for the great offensive, and meanwhile the following note from a member of the brigade, Pte. J. Aldersley, is of interest:

"We do not use the sidecar machines at present, except for carrying ammunition. It has all been trench work so far. Our outfits are similar to those of the British M.M.G.S. The solo machines were originally all Douglasses, but, of course, some of them have been broken up or smashed; in fact, mine is the last Douglas of the original set left, and by the time you receive this I shall be mounted on a Triumph.

"I must certainly speak well of the Douglas, as I had mine for eight months. The latter included a couple of trips to the hospital, through skids on these cobble stones which are most treacherous in wet weather. My Douglas has done a great deal of towing of other machines which have been stopped on the road. One day I was out teaching one of the boys to ride when his machine broke down fourteen miles from camp. I put a rope round his front forks and tied the other end to my stand. It was a very dark night, and as my companion was a novice it was a trying ride. Anyway, we set off, and I just impressed upon him to keep the rope tight by using his foot brake. We never left our seats once until we arrived back in camp. I did not use the high gear very many times, but I call it a very remarkable performance."



Sidecar ambulance used by the French military authorities. Ambulances, machine guns, rapid transit of officers—what will be the next sphere of the sidecar?



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

### The Case of Disabled Motor Cyclists.

Sir,—We read with pleasure that you are interesting yourselves in a scheme for finding employment for discharged Army and Navy men who have had some little knowledge or experience in motor work. There is no doubt that good jobs can be found for such men if they are not totally disabled. Even if at the present time there were not so much need, it is well that we should be organised and ready.

Just recently we have ourselves set on in our works a partially disabled soldier as a works policeman. We expect that his Army training and his previous experience will fit him specially for a job of this sort; this man was found for us by the Rotary Club in Birmingham, who have undertaken to provide work for men much in the same way as the scheme you have in hand. We should be pleased to notify you as to what vacancies we have or could make, and we have no doubt that other motor cycle manufacturers will also be glad to bear this in mind, and notify committees in various centres when there is an opening.

Wishing good luck to the movement,

BUTTERFIELDS, LTD.

### The Isle of Man.

Sir,—In your issue for January 27th you do the Isle of Man Steam Packet Co. but scanty justice. You mention that two of their boats are doing War Service. This company has (or had) a magnificent fleet of seventeen of the finest passenger boats in the British Isles, including the fastest passenger boat in the world—the *Ben-ma-Chree*. Of this fleet fifteen are now in H.M. Navy. One is a long-distance transport, six are short-distance transports, and the rest are patrolling different parts of the world. The *Ramsey*, which must be well-known to all T.T. enthusiasts, has already paid the penalty of her excessive pluck.

Cannot some of your readers come over here for a motor cycling trip to this motor cyclists' paradise and help the people of this much stricken island to live? Just now, with no T.T. races, no car races, and no excursions: our poor boarding-house keepers and tradespeople are in sore straits. We offer you magnificent scenery, splendid roads, first-rate accommodation, and a most hearty welcome. Sulby Bridge, Ramsey hairpin, the Goose Neck, the mountain road, Bray Hill, Ballacraigne, and Creg Willy Hill, with their lovely backgrounds of bold mountain and wild glen, and round them all the wide sea—all these places famous in the annals of motor cycling—are offering the amateur such charms and exhilaration as he can find nowhere else in the British Isles—and we have no speed limit.

Castletown, I.O.M.

(REV.) E. H. STENNING.

### Two-stroke Design.

Sir,—I notice in *The Motor Cycle* of January 20th an article written by Mr. James Martin on two-stroke engines, in which he points out that the chief faults of this type of engine are lack of flexibility, four-stroking, and heavy fuel consumption.

I have invented a carburettor which gives a two-stroke the same flexibility as a four-stroke, and I should be pleased if Mr. Martin could test this invention. P.W.H.

Sir,—We agree with a good deal of what Mr. Martin says, but would point out that his essential idea—that of conserving the released gases—is embodied in Murphy's patent and used in our  $\frac{3}{2}$  h.p. Bullet two-stroke. In its

simpler form it consists of a release valve communicating (by means of a small diameter brass tube down which the flame of combustion cannot pass) with the transfer chamber.

With this arrangement you can drive to a large extent on the release valve, but we scarcely think that, even with a mechanically-operated valve such as he proposes, the throttle could be discarded altogether.

The reduced pressure in the cylinder does indeed give very cool running. The comparative freedom from exhaust gases in the new charge may also help, but their supposed deleterious effect is a point Mr. Martin can emphasise too much. A reasonable proportion of inert gases (we are speaking now of the gases themselves without reference to their temperature) can surely do little harm; if so we should be having trouble with the nitrogen of the air, which is absurd.

BIRMINGHAM LIGHT MACHINE CO.

H. R. HUGHES.

Sir,—Will you please allow me to state how much I appreciate Mr. James Martin's article on the two-stroke motor cycle engine in the last issue of *The Motor Cycle*. It is well thought out, and most instructive to amateurs like myself who are greatly interested in all that appertains to motor cycles. But I do take exception to what he points out as the three great faults of all two-stroke engines.

I have had three Scott motor cycles, viz., 1910, 1912, and 1914, and have ridden close on 30,000 miles, but I have never been in traffic where I could not keep behind and still keep my engine running, which does not tally with Mr. Martin's statement *re* coarseness and want of flexibility. I have never had the slightest sign of four-stroke, and as to petrol consumption, I never run less than 65 m.p.g. with sidecar and passenger, and the engine is always clean, both inside and on the surface. I have never had a drop of oil from the engine on either boots or clothing, and have travelled as much as 7,000 miles without a single stop from mechanical trouble on the road. Could any motor cyclist wish for more?

T. J. BELLINGHAM.

Sir,—We read with feelings of mixed interest the article on "A New Design of Two-stroke Engine," by Mr. J. Martin, appearing in your issue of January 20th. The author puts the faults or shortcomings of the two-stroke engine in a very fair and clear manner, but we feel that he tries to belittle the advantages of this kind of engine. For instance, he speaks of the heavy consumption of oil and fuel on the standard type of engine of about 70 m.m. bore.

We feel that as far as the Connaught engine is concerned he can know very little of what this engine can do. We are prepared to show dozens of letters from various riders whom we have never met who are getting from 100 to 160 m.p.g., and, as far as oil consumption is concerned, we are quite sure that in proportion to the power of four-stroke engines the Connaught engine can show at least 25% advantage. Mr. Martin makes an assertion that the general design has not altered "one iota" for some years. This in our case is distinctly untrue, as we in 1912 placed on the market an engine differing greatly in design from the standard two-stroke engine, which was invented about 1880 or 1883 by Mr. Day and has been blindly copied since then. Since its first appearance we claim to have improved details of our engine in very many ways.

What we are mostly concerned about, however, is the so-called new design illustrated in the article referred to.

We wish to state that we took out a provisional protection some months ago for the identical engine, and a complete specification and drawings are now in course of preparation. If we did not know it to be impossible, we might have said that Mr. Martin had seen our designs, his engine being an exact copy of ours.

We presume when he speaks of the "large firms" that he would not be thinking of ourselves, but in our own defence we wish to say that we have never ceased to spend time and money in experiments and research in order to maintain the position we have made for ourselves. We have only to say that we were the first firm to publish details of a simple horizontally opposed twin two-stroke engine, which was the signal for others to follow.

The great vogue of the two-stroke engine is due to its simplicity of construction, and users feel that that simplicity and efficiency amply repay them for any trifling shortcomings which it may have as compared with the complications of the four-stroke engines.

THE BORDESLEY ENGINEERING CO., LTD.

#### Wanted, a Motor Tricycle.

Sir,—May I strongly urge your correspondent Mr. R. Aitchison to abandon all idea of purchasing anything on the lines of a tricycle, and to go in for a sidecar outfit instead. The fact that the tricycle is finally superseded by the sidecar points to the practical superiority of the latter. I would advise your correspondent to go in for a  $3\frac{1}{2}$  h.p. chain-driven single-cylinder machine fitted with a kick starter, such as a P. and M., Bradbury, or Sunbeam. If the question of price is of importance he might safely venture so far back as a 1912 model, so long as proper judgment is exercised in its purchase, and having made his purchase I would advise him to ascertain the top gear ratio, and, if necessary, reduce it to, say,  $5\frac{1}{2}$  to 1. He will find the sidecar will prevent side-slip, while it will prove immensely useful for carrying such personal items as a spare waterproof or papers in connection with his business.

The reason why I recommend a  $3\frac{1}{2}$  h.p. machine in preference to a lightweight is because there is not the same likelihood of konking out on hills and having to push—a procedure which would be regrettable for a rider of your correspondent's advanced years. Also, he will find a powerful machine less tiring to handle than one of small c.c. Again, if a lightweight of, say,  $2\frac{1}{2}$  h.p. were used a very light sidecar would be necessary, and light sidecars are dangerous for any but active riders, when ridden empty, owing to the suddenness with which they lift on corners.

If your correspondent would care to write me personally I shall be happy to advise him to the best of my ability.

H. M. B.

#### Spring Frame Design.

Sir,—We are interested readers of your paper, and have noticed in the issue dated January 13th a spring frame design evolved by Mr. P. Mills. This spring has already been used on the landing chassis of the Blériot monoplane. We have attempted to utilise this device on our lightweight motor cycles. We find that it is inadequate. Perhaps the "inventor," Mr. P. Mills, could correspond and explain the difficulty.

GERARD SIMPSON.  
REGINALD LISTON.

#### Repairing Inner Tubes.

Sir,—There has been a considerable amount of correspondence in your columns about the various methods of repairing inner tubes, but none of them appear to be equal to the Diamond tyre patches which I purchased in America.

These patches have the business side protected by a thin piece of canvas. When repairing a punctured tube it is only necessary to remove the canvas, which tears off easily, and to saturate the prepared face of the patch with petrol. After the petrol is drained off and the patch exposed to the air it reaches in a few minutes the correct degree of tackiness, and should be applied to the tube, which has previously been cleaned in the usual manner. No rubber solution or other adhesive is to be used.

I have used these patches on Ford car tubes and on motor cycle tubes for the last two years, and have not yet had one leak or lift or otherwise give trouble. The manufacturers, I believe, are the Diamond Tyre Co., an American concern, and I do not know whether the patches can be obtained in England.

C. G. BIRCH.

#### A New Breed of Cycle Car.

Sir,—As I am a constant reader of your paper I noticed a reference made in the issue of November 25th by "Ixion" to a small car that was used by an American aviator, the design of which your correspondent took occasion to commend. On account of my familiarity with the car in question, I take pleasure in sending you a photograph of it. The man seated in the miniature automobile is Art. Smith, the official aviator of the recent Panama-Pacific International Exposition. Besides being a most fearless and skilful airman, Mr. Smith is the designer of the machine illustrated.

The car is of the double chain-drive type with a differential on the countershaft. The motor is a 11 h.p. twin-cylinder racing Harley-Davidson, with three-speed gear box and clutch of the same make, all mounted in the same way as in the Harley-Davidson motor cycle, but to the left of the driver, and under the bonnet in front, a position that permits the operator to obtain plenty of leg room. The engine is started after the driver is seated by a kick-starter that is conveniently located. About one gallon of oil is carried in

a compartment in the dummy radiator, and the petrol tank (holding three gallons) is located behind the driver's seat.

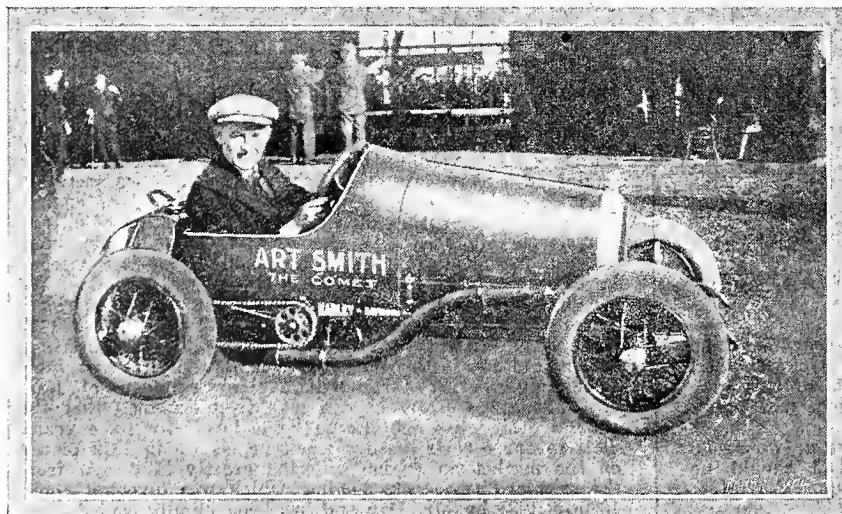
The wheels are of the regular 20in. x 4in. aeroplane type, as used on nearly all American aeroplanes. Goodyear tyres are fitted, and a spare wheel will be observed carried in regular tyre holders at the extreme rear of the machine.

Half-elliptic springs are in front and cantilever springs at the back, with about 2in. spring amplitude. Thanks to the large diameter of the tyres, the little car rides remarkably easily. It is electrically lighted, the current being furnished by a storage battery.

Art. Smith has placed an order with Maggini and Perkins, the San Francisco Harley-Davidson agents, for ten more power plants of similar design, his intention being to build ten more miniature cars of similar make to the one illustrated. Speed will be the main object, as Smith's plans are to organise races for these little machines in conjunction with his aeroplane displays.

WILLIAM E. SLATER.

San Francisco, Cal.



The newest breed of cycle car. An American twin-cylinder of most attractive specification and appearance owned by a famous American aviator. It is described in the letter from Mr. Slater on this page.

**Foreign Magnetos.**

Sir,—I notice in "Ixion's" comments in a recent issue of your excellent paper that he complains of trouble with American magnetos. Two friends and I have had machines fitted with American magnetos, and we have all had a great deal of trouble since we had the machines. They have all given up the ghost completely, like "Ixion's," after 2,000 miles. After I have spent a day overhauling them, they go about another 2,000 miles, and sometimes less. We have decided that on our next machines we will have British magnetos.

C. BESWICK.

**Sparking Plug Design.**

Sir,—The so-called "Novel Sparking Plug" illustrated on page 49 of *The Motor Cycle* for January 20th has a striking likeness to the sparking plug patented to us on patent No. 19,800, 1911, the specification of which we enclose for your perusal. You will see that one of the electrodes has a hollow conical form, and acts when in use as a venturi tube exactly as is claimed for the plug illustrating your review.

In fairness to us we hope you will see your way clear to refer to this matter in your next issue, so as to draw the attention of your readers to the fact that the conical form of the cup constitutes a prominent feature of the Forward patented sparking plug.

THE FORWARD MOTOR CO.

[The specification enclosed shows designs of plugs with ring and conical cup electrodes, but in justice to Mr. Burton we must remark that no mention is made of a venturi tube action.—Ed.]

**A Death Trap.**

Sir,—I was riding my motor cycle, with a friend on the carrier, recently between Formby and Prescott. It was at night, and my lamp, now that the new Lighting Order is in force, gives only a feeble light.

The road on nearing Maghull passes over the Leeds and Liverpool Canal by means of a swing bridge operated by hand. There was not a red lamp or, indeed, a lamp of any sort guarding the approach to the bridge, and I stopped dead a bare three yards from the water's edge as the bridge swung back to the other side to allow four or five steam barges to pass.

It was only the lights on the barges which caused me to pull up in time. On enquiry I was told that all bridges on this canal are left similarly unguarded (although I cannot vouch for this statement), and can only wonder whether any vehicles have gone into the canal through the absence of warning. Surely it is somebody's duty to see that lights are put in such places, especially at this time of darkened roads.

W. I. S. KELWAY.

[We have no doubt that one of the motoring bodies will take action in the matter now that the complaint has been ventilated.—Ed.]

**Four-cylinder Motor Cycles.**

Sir,—I read with interest the articles in *The Motor Cycle* of January 13th on the subject of four-cylinder machines. Perhaps my experiences with some of the older types might interest you and your readers.

My first two motor cycles were up to date belt-driven singles, and I can honestly say that I never had a full week's running without some mechanical trouble or other. I bought my first four-cylinder F.N. a year and a half ago. It was a 1908 model, and I fully expected plenty of trouble. I certainly had my share of it for about a fortnight until I got to understand matters, and from then until the day I sold it (about five months ago) I never had a mechanical stop or even a puncture. I nearly always had a passenger on the carrier, and only hills like "Rest and be Thankful" used to make us dismount.

When I bought it the carburetter fitted was a B. and B., which perhaps gave a little extra power when running,

but the engine never went well until I tried the F.N. automatic carburetter, when all misfiring when the throttle was opened came to an end, and much slower running was obtained—in fact, I could go at 5 m.p.h. without a misfire or a jar of any kind occurring. Central intakes were also fitted.

I am at present riding another 1908 four-cylinder F.N. with greater success than the first one. The machine will not run so slowly owing to the strength of the automatic valve springs, but this will gradually wear off, and the highest speed I have got so far is 53 m.p.h., without any preparation.

Skidding is a thing I have never experienced with an F.N., even on the worst kinds of roads, and in the city here (Glasgow). I have yet to have that terrible trouble with the inlet valves and magneto which I get dinned into me by people who have never ridden a four-cylinder F.N. in their lives, but have heard about it from so and so.

I think if one uses his machine decently, taking a little time now and again to go over it he will not find a more trusty machine than the four-cylinder shaft-driven F.N. I will never use another make of machine if I can get an F.N.

I add the usual disclaimer.

WM. O. HARVIE.

**The Motor Cycle Thief.**

Sir,—On behalf of the motor cycling world, I should be glad if you would let this letter act as a warning to owners selling their machines. I advertised my 1915 7-9 h.p. American Excelsior for sale recently, and a man of about 26 years of age, clean shaven, thin face (somewhat lined), medium height, and wearing a slouch hat, muffler, and light overcoat, applied to see the machine. Having shown it to him he fixed on a certain price, he agreeing to call in the morning, pay for, and take away the cycle. But as soon as my back was turned he slipped back to where I store the machine and decamped with it. This was in the evening of the 17th ult. He could not have ridden it, as it was not in working order. He must, therefore, have wheeled it to his destination.

The machine is one of the earlier 1915 7-9 h.p. models, fitted with the single gear, colour grey, which he will probably alter. I am prepared to offer a sum of £5 for information which may lead to its recovery.

JOHN W. SHARPUS.

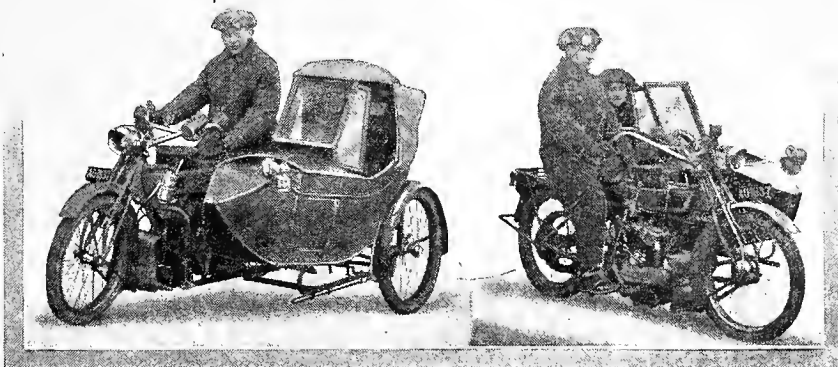
24a, Earl's Court Gardens, S.W.

**A Home-made Hood and Windscreen.**

Sir,—I am enclosing two photographs showing a hood and windscreen entirely made at home. There are no strap attachments, and the whole can be put up or down by the passenger without any assistance, in any kind of weather, while the machine is in motion. The sidecar is entirely covered in right up to the passenger with three-ply wood, to which the windscreen is attached. When not in use, it folds back flat on to the cover, and the wings fold inwards flat on to the screen. This is the second winter I have ridden with this attachment.

The combination is a 6 h.p. Matchless and Coronet sidecar.

W. TOLSON.



Home-made hood and screen described in letter on this page from Mr. W. Tolson.



## ROYAL RUBY SPRING FRAME.

Important Addition to the List of Firms producing Spring Frame Motor Cycles.

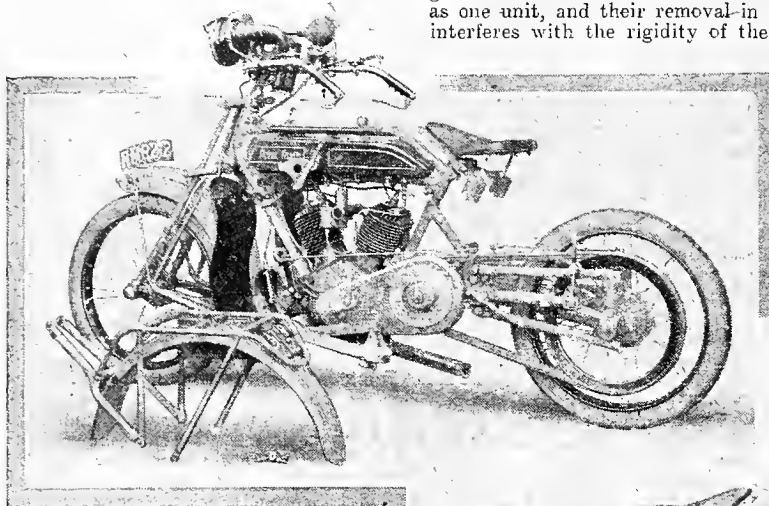
**A** VERY interesting spring frame machine, which we have recently tried, is the latest production of the Royal Ruby Cycle Co., Ancoats, Manchester. The system of springing Messrs. Royal Ruby have

for the sidecar axle coupling. A special sidecar, sprung on the same lines as the machine, is now under course of construction.

The carrier seat stays and rear mud-guard can be detached from the machine as one unit, and their removal in no way interferes with the rigidity of the frame.

being similar to that of the Druid, except that long leaf springs, with their unequalled shock-absorbing qualities, take the place of the ordinary coil springs. The action of these forks is fascinating to watch, and even under the most severe conditions no road jolt is conveyed to the handle-bars.

The model is provided with a metal-to-metal internal expanding foot brake and foot controls for the clutch, and a Jardine four-speed gear is fitted. The position of the footboards can be adjusted to suit the rider by simply loosening one nut. Both wheels are of the quick detachable variety, and many other minor points of convenience are incorporated in this luxurious model twin-cylinder sidecar mount.



Twin-cylinder chain-cum-belt driven Royal Ruby fitted with the manufacturers' spring frame described on this page. In the upper view the carrier and rear guard are removed to illustrate more clearly the system of suspension.

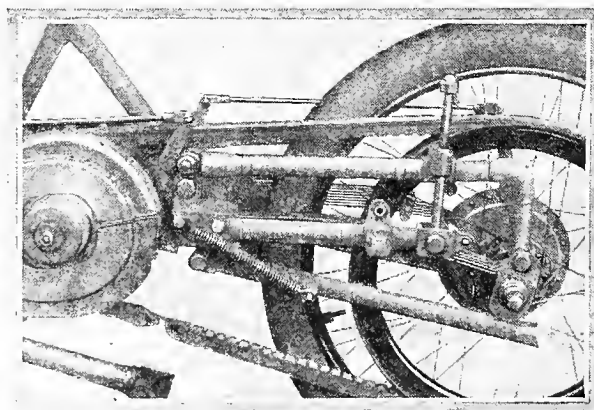
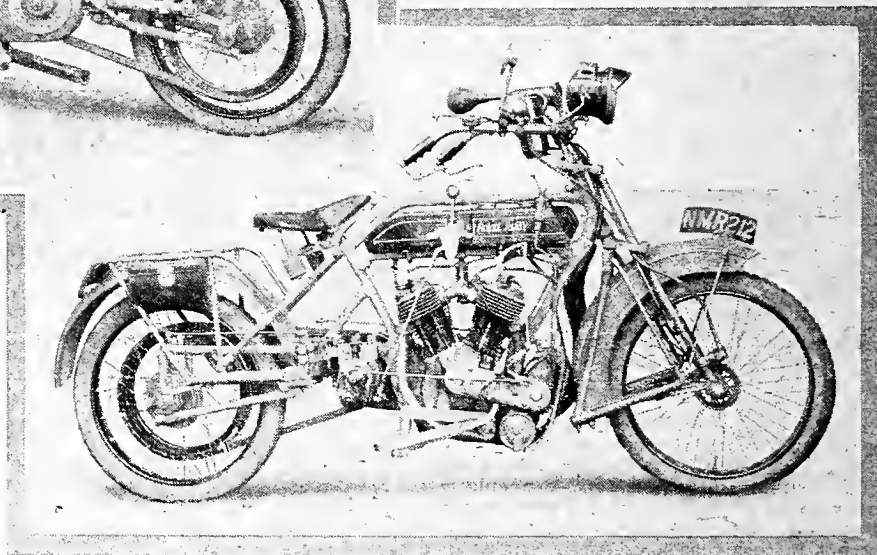
employed is thoroughly sound, but it may be mentioned that the makers do not, as yet, consider the device has attained their usual high standard of excellence, and only after long and severe road test will they rest assured that the model is ready for the hands of their purchasers.

The machine, which is fitted with an 8 h.p. J.A.P. engine, and designed throughout for sidecar use, is sprung both front and rear by means of long leaf springs, pivoted at the wheel axles, so that an absolute minimum of unsprung weight is obtained. With regard to the rear springing, it will be observed that the only unsprung portions of the frame are the chain stays, which perform the important function of holding the wheel in position and preventing lateral movement. With the exception of these stays, the entire frame, including the carrier, etc., is insulated from road shock, the machine thereby gliding over the worst of roads with no suggestion of jolt.

On the left-hand side of the rear wheel a stout pipe is extended parallel with the chain stay, and at the end of this tube a vertical guide, passing through a bearing carried by the chain stay, gives additional support. This bar is, of course, sprung with the remainder of the frame, and to it is brazed the attachment

The chain stays are very strongly constructed, and ample bearing surfaces are provided for all working parts.

The springing of the front wheel is at once obvious, the action of the forks

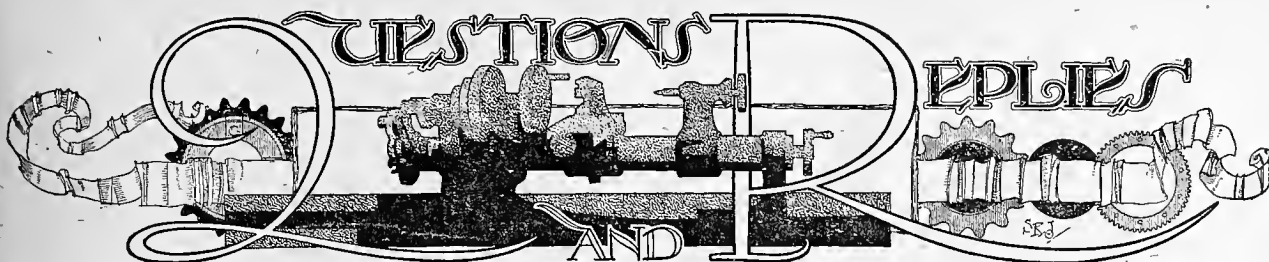


A near view of the Royal Ruby method of springing the back wheel.

### MEMBERS OF THE PUBLIC SCHOOLS M.C.C. AT THE FRONT.

In a recent issue we published the names of several P.S.M.C.C. men who were serving their country in various parts of the world. We have lately received a letter from Cpl. H. B. Brown, from which we make the following extracts:

"Bertram Fowke came out with me. He is now with the 5th Division. I have not seen him since we left the base. I came across Victor Dreshfield and Jack Pauling in September, who are in a machine gun section of the 6th Buffs. They were in the fighting at the end of September, but were both fit and well when I last saw them. Tamplin is a sergeant in the R.E.'s, and is employed on special work in an English factory. I am myself riding a 1915 Triumph. North, of Ariels, is with us now."



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### High Compression.

**?** Will you please tell me the reason I have to time my engine—an old a.i.v. twin—so late to get the best results? The points break with piston on top, lever fully advanced.—G.H.

It is curious that you should have to time your engine so late. Perhaps the reason is that your connecting rod bearings are rather worn, so causing the engine to knock if the ignition is advanced too far. The only other reason would be that the compression is too high; therefore the best result is obtained by igniting the mixture after the compression is slightly lower, due to the piston having passed the dead centre. If this be the case, it would be advisable to lower it slightly by inserting a washer between the cylinder and crank case.

### The Breakage of Petrol Pipes.

**?** Could you tell me a better method of conveying lubricating oil and petrol than by copper tubes? The latter, it seems, are given to breaking, for while starting the engine a short time ago the oil, which is force fed, escaped and ran on to the ground. When it was examined the pipe was seen to be broken just below one of the unions. This is not the first time this has happened, therefore I think there should be some better and more flexible tubing on the market. Some time ago I think I saw some tubing that would satisfy my wants in use on a racing machine, and this I believe was made out of very thin strands of leather woven together.—R.F.R.

There is no better way of conveying petrol and lubricating oil than by copper pipes. The cause of the latter breaking is probably due to the fact that they are not properly annealed (which should be done by heating them to a red heat and then cooling them by immersion in water), or that the pipe is too short. The pipe should have curves in it, so as to allow sufficient spring to avoid being broken through vibration. There is a flexible tubing for petrol, which is sold by Messrs. Bowden Wire, Ltd., Victoria Road, Willesden Junction, N.W., but copper is more generally used, though on aeroplane engines an armoured petrol-proof rubber pipe is employed.

### Oil Leakage.

**?** I shall be much obliged if you will kindly give me advice with reference to the following matters relating to my  $2\frac{1}{2}$  h.p. 1914 motor cycle: Oil is thrown out round the tappets, and between the pulley and crank case. I have fitted brown paper washers at the crank case joint and between the timing cover and base, but do not know the best way to cure the other leaks. Should a vacuum valve be fitted, and if so, does it matter whether fitted to the crank case or the timing case (the latter would be more accessible)? If such a valve is necessary, will you please say upon what principle it is designed to work?—L.G.B.

The fitting of a felt washer between the pulley and crank case is sometimes beneficial. The leakage of oil round the tappets may be due to worn tappet guides. The vacuum valve is certainly advantageous, and as it reduces pressure in the crank case, it naturally prevents the leakage of oil, provided, of course, that the bearings are in good order. The valve is merely a non-return valve; usually of the ball type. When the piston descends the ball is blown off the seating, and allows the crank case compression to escape. On the up stroke the valve closes. Provided there is a good connection between the crank case and the timing gear case, you may fit the relief valve on the timing gear case; otherwise, on any convenient spot in the crank case.

### Finding Gear Ratios.

**?** (1.) I have a 1913 4 h.p., clutch in back wheel. The top gear is about  $3\frac{1}{2}$  to 1. The back belt rim is 20in. I wish to reduce the gear to about 5 to 1 top for sidecar work. What would the gears be respectively with a 22in. and 23in. back belt rim? (2.) What is the best oil to use for a plate clutch? (3.) My valve caps leak. I have fitted new washers, but there is still a faint leak around them. What can I do?—R.B.

(1.) You do not furnish sufficient particulars for us to give you the exact gears you will obtain with various sized belt rims, as you do not say what size your pulley is, and also from what point you

are measuring the belt rims. We assume you have a 1in. belt, and will take the measurements from the point in the pulley where the centre of the belt is when placed in position. The front pulley is 5in. in diameter and the present rear belt rim is 19in. when measured in this manner, therefore the two belt rims will give  $4\frac{1}{2}$  to 1 and  $4\frac{3}{4}$  to 1 respectively. It is a simple calculation to ascertain the gears obtained with various pulleys. Take the diameters of the engine pulley and belt rim from the points where the centre of the belt is and divide the smaller into the larger; this will give you the gear you will obtain. (2.) Thin engine oil, or engine oil mixed with a little paraffin is most suitable for a metal-to-metal plate clutch. If the clutch is too fierce add more oil; if inclined to slip add more paraffin. (3.) If you have fitted new copper washers and tightened the caps down as much as possible when the engine is warm you should not have leaks. If, however, it still leaks after doing this, remove the cap, and apply a little engine oil or black lead to the thread of the cap, and also on both sides of the washer.

### Turning a Sidecar.

**?** Does either the sidecar wheel or back wheel of a motor bicycle with sidecar skid sideways in any appreciable manner when the machine is turning in the direction to which the sidecar is attached? For instance, place a machine with sidecar on a perfectly flat surface; put the steering wheel (front wheel of bicycle) in any position. Can the machine be moved in a circular path without any of the wheels having to skid sideways?—J.H.

You can turn to your left practically in your own length, as the sidecar wheel merely acts as a pivot, and remains almost stationary, while the motor cycle back wheel does the driving. In turning to the right, however, there would be a slight amount of skidding, as the motor bicycle wheel would have to drive and act as a pivot at the same time. It is better, when you have to turn sharply, to turn to the left when you are driving a sidecar combination. Care, however, should be taken, when turning in this direction, as the sidecar wheel is very liable to lift.

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**Popping in Carburetter.**

?

I ride a Junior Triumph, 1915. When I start I flood the carburetter and push off as per directions. Then the carburetter gives a big flash and explosion—I suppose a backfire. I then start again, when it may recur or go on well. This backfire into the carburetter sometimes occurs when I am riding. I then stop and go off again. I notice after a backfire the engine never runs as well as when it does not occur.—W.D.

The cause of popping back into the carburetter is usually due to too weak a mixture. It may be caused by a partially choked jet or too liberal a supply of air. Excessive carbonisation, causing pre-ignition, might also cause this trouble on a two-stroke, but this would only be noticed after running some distance.

**Lubrication of Magneto.**

?

I own a 2½ h.p. two-stroke motor cycle, which I have ridden during the past twelve months, and I think it is about time the magneto was oiled. The magneto is a small U.H., but the trouble is that I cannot see any oil holes, and it has been making a grinding noise lately. I shall be very glad if you can help me out of my difficulty with it.—H.H.

If no lubricators are provided on your magneto, the bearings are lubricated by being packed with grease, which should be sufficient for a very considerable time, probably 5,000 miles. To repack them it is necessary to take the magneto down and remove the end plates; the bearings should then be well packed with vaseline. The grinding noise may be due to a broken ball cage or even a broken ball, so it would be advisable to take the bearings down in any case. As you are a novice we would advise you to consult an electrician.

**Cleaning by the Oxygen Process.**

?

My machine is a 6 h.p. horizontally opposed water-cooled Humber of 1916 make. Is it at all harmful to clean the cylinders by burning out the carbon deposit by oxygen gas as is done in the case of car engines? There seems to be a divided opinion as to the result of this on the metal. Do you know whether any harm is caused to the cylinder walls or the piston? I might say the valves and the valve seatings in this model are removable without taking off the cylinder, therefore before the gas was used the valves could be removed with their seatings.—R.J.A.

There is no harm in the oxygen process for cleaning cylinders. We have had a Douglas motor bicycle cleaned out in this way, and the result was most satisfactory. This does not mean that the process can entirely take the place of taking down the engine, which should be done at least once a year. The oxygen process relieves the cylinder heads, pistons, valves, etc., of carbon, but, of course, does not get at the carbon behind the rings. It would certainly be as well to remove the valves and seatings.

**READER'S REPLY.****Too High a Gear.**

I notice in your issue of January 20th (page 61) a letter from "M.R.S." regarding trouble with a 1915 5 h.p. Indian. I possess a similar machine, and as I had similar trouble, perhaps my remedy may be of use to him. The engine sprocket wheel on this machine has usually eighteen cogs. Write to Hendee Co. (give No. of engine) and get a fourteen-tooth sprocket wheel which costs about 4s. Remove one link from engine chain when fitting. This smaller wheel will enable him to crawl at twelve miles per hour on middle, and about fifteen to seventeen on top gear. I am afraid there is something wrong with his mechanical lubricator. I can get ninety-five to one hundred and five miles per quart. The Hendee Co. issue a book of instructions (gratis), which gives very useful information.—M.R. McC.

**EXPERIENCES WANTED.**

"J.M." (Dublin).—Grado multi-pulley on a 3½ h.p. solo. Belt wear and slipping.

"A.S.R." (Caithness).—Zilla, Whittle, or Service No. 3 belts, with heavy chain-cum-belt combination.

"F.L.H." (Solihull).—2½ h.p. 1913 Humber twin, and 1915 2½ h.p. Ixion and O.K. two-strokes.

"H.R.N." (Grantham).—F.N. (four-cylinder) 1913-14. Reliability, speed, efficiency, consumption, ease of starting, and smoothness of shaft drive.

"B.F.R." (Birmingham).—2½ h.p. de luxe T.D.C. Reliability and capability for sidecar work. Also Grado pulley.

**RECOMMENDED ROUTES.**

HAWKHURST TO WOOLWICH.—C.J.S.

Hawkhurst, Lamberhurst, Pembury, Tonbridge, Sevenoaks, Locks Bottom, Bickley, Elmstead Woods, Mottingham, Eltham, Well Hall station, Woolwich.

READING TO EASTBOURNE.—A.C.

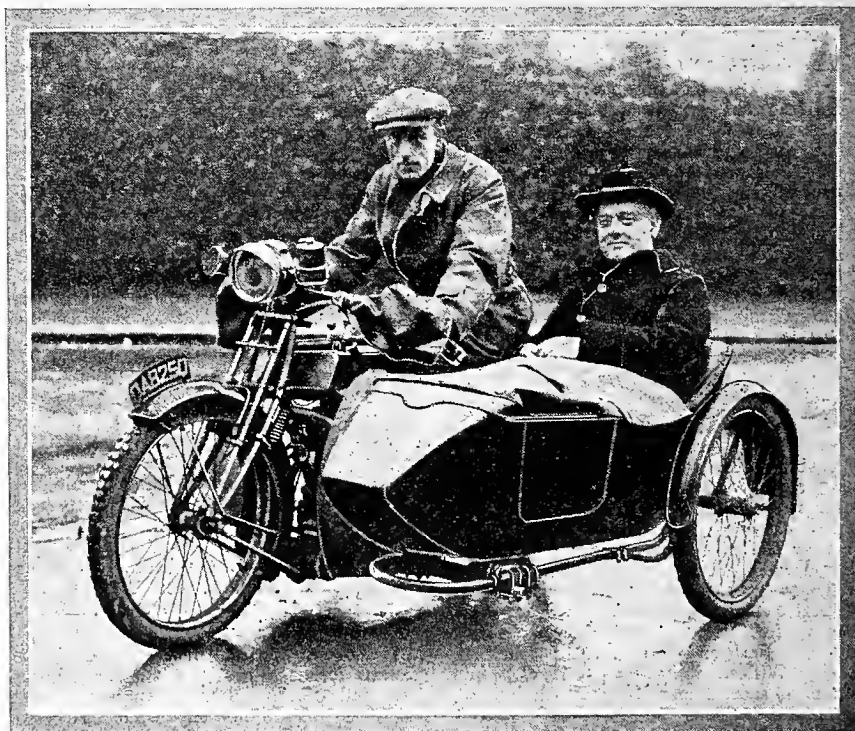
Reading, Odiham, Farnham, Guildford, Cranleigh, Horsham, Cowfold, Hurstpierpoint, Ditchling, Lewes, Wilmington, Eastbourne. Approximately eighty miles.

NEWPORT (MON.) TO PAISLEY.—W.D.E.

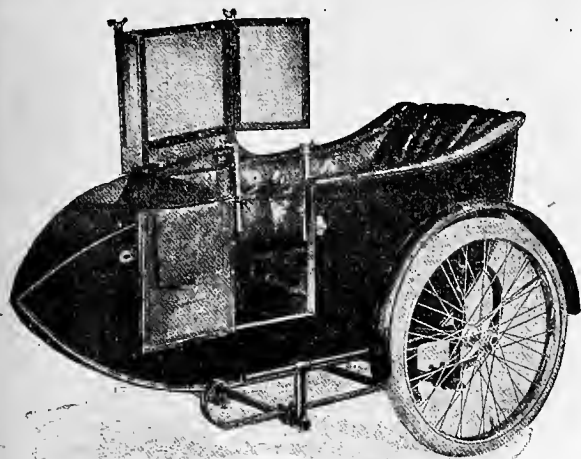
Newport, Monmouth, Hereford, Leominster, Ludlow, Craven Arms, Church Stretton, Shrewsbury, Whitchurch, Tarporley, Warrington, Wigan, Preston, Garstang, Lancaster, Kendal, Penrith, Carlisle, Gretna Green, Ecclefechan, Lockerbie, Beattock, Abington Inn, Stonehouse, Strathaven, Kilbride, Paisley.

BIRMINGHAM TO EASTBOURNE.—B.W.H.

Birmingham, Stonebridge, Coventry, Ryton, Dunchurch, Braunston, Daventry, Weedon, Towcester, Stony Stratford, Fenny Stratford, Dunstable, Redhourn, St. Albans, Hatfield, Hertingfordbury, Hoddeston, Waltham Cross, Wake Arms, Epping, Chipping Ongar, Brentwood, Ingrave, Orsett, Tilbury, ferry, across Thames to Gravesend, Meopham, Wrotham, Ightham, Tonbridge, Tunbridge Wells, Mayfield, Cross-in-Hand, Hailsham, Eastbourne. Approximately 200 miles.

**INITIATION INTO THE PLEASURES OF SIDECARING.**

Father Adderly, the well-known Birmingham canon, off for his first run in a sidecar, which he thoroughly enjoyed. The driver of the Sunbeam-Canoet sidecar outfit is T. Blyth Clayton, a Midland photographic contributor to this journal.



# DUNHILLS

## PATENT

# TRIPLE WINDSCREEN.

**A**N ideal windscreen—keeps the passenger always snug and cosy in the coldest weather and free from draughts.

The side wings are detachable, and the screen can be tilted to any angle. It will fit any make of car.

A twist of a wing nut is sufficient to release the catch and let the screen swing across and allow the passenger to alight.

In Polished Walnut with Nickel Fittings :

Price complete with side wings - - - £3 0 0

Price of Single Screen - - - £2 2 0

# Dunhills LTD.,

359-361, EUSTON RD., LONDON, N.W.

— 42-43, LOMBARD STREET, E.C. —

MANCHESTER :  
90-92, Cross Street.

GLASGOW :  
72, Vincent Street.

# WHITELEY'S

## FOR MOTOR CYCLES

We offer from **STOCK :**  
**COMBINATIONS.**

7-9 h.p. 11F HARLEY-DAVIDSON, special H.D. Sidecar .....	£	s.	d.
7-9 h.p. 11J HARLEY-DAVIDSON, special H.D. Sidecar, also dynamo electric lighting .....	98	4	0
4½ h.p. JAMES Combination .....	80	9	6
6 h.p. ENFIELD Combination .....	89	5	0

**SOLO MACHINES.**

7-9 h.p. 11F HARLEY-DAVIDSON .....	78	5	0
7-9 h.p. 11J HARLEY-DAVIDSON, dynamo electric lighting set .....	86	13	0
6 h.p. ZENITH Clutch Model "F" .....	84	6	0
4-5 h.p. ZENITH Clutch Model "D" .....	73	18	0
3½ h.p. ZENITH Model "A" .....	62	6	0
3½ h.p. PREMIER, 3-speed .....	66	0	0
2½ h.p. N.U.T., twin, T.T. .....	69	9	2
2½ h.p. O.K.-J.A.P., 2-speed .....	38	0	0
2½ h.p. ALLON, 2-stroke, 2-speed .....	42	0	0
2½ h.p. CALTHORPE-J.A.P., 2-speed, variable ignition .....	38	0	0
2½ h.p. HOBART, 2-stroke, 2-speed .....	36	15	0
2½ h.p. CALTHORPE, 2-stroke .....	27	14	6
2½ h.p. CALTHORPE, 2-stroke, 2-speed ..	31	7	0
2½ h.p. NEW IMPERIAL, 2-speed, variable ignition .....	37	18	0
2½ h.p. NEW IMPERIAL, with clutch and kick starter .....	44	4	0
2½ h.p. LEVIS, 2-speed, de Luxe .....	50	10	0
2½ h.p. LEVIS, latest model .....	32	0	0
2½ h.p. ALLON 2-stroke .....	34	0	0
2½ h.p. JAMES, 2-stroke, 2-speed .....	38	11	9
2½ h.p. IVY, 2-stroke, Lady's model .....	31	0	0

**Any Available Machine supplied upon  
Deferred Payment Terms.**

**ONLY 2% EXTRA**

Added to List Prices for Twelve Months' Credit Accommodation.

One-fifth of the Total Amount Cash Down, or Ten Pounds only is sufficient if the machine selected is over Fifty Pounds in Value.

**Write for particulars. Packing Free.**

Carriage paid to any address in the United Kingdom.

**A few bargains in second-hand machines  
and combinations.**

Early deliveries of the T.D.C. De Luxe motor cycles and special deferred payment terms arranged.

**PARTICULARS UPON APPLICATION.**

Sole London Agents for the Ixion Motor Cycles.

**WM. WHITELEY, Ltd.,** QUEEN'S ROAD,  
LONDON, W.

Telephone : Park One. Telegrams : "Whiteley, London."



# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### Abingdon.

**L**ATE 1914 Abingdon King Dick, clutch, kick start, in perfect condition, good tyres and belt, too fast and powerful for owner; £40, lowest; also Villiers free engine wheel, complete with control, not run 100 miles, £27/5.—Toms, Tremcor, Withiel, Bodinn, Cornwall. [X0752]

### A.J.S.

**19**16 A.J.S., 2½ h.p., in stock; £55.—Cross, Agent, Rotherham. [X0868]

**A** J.S. 1916 Combinations in stock.—Jobbarn, Agent, Willenhall, Staffs. [X0802]

**A** J.S., 1916, 2½ h.p.; £58.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

**A** J.S., 1916, 2½ h.p., 3-speed model, in stock; £58.—Jones Garage, Droitwich. [X0371]

**A** J.S., 1916, 4 h.p., in stock; £76.—Williams, Chapel Ash Depot, Wolverhampton. [X0939]

**A** J.S., 1912, 2½ h.p., 2-speed, hand clutch, good condition; £19.—Box L618, c/o The Motor Cycle. [9474]

**A** J.S. 1916 6 h.p. Combination, also 4 h.p. combination and 2½ h.p. 3-speed models in stock.—Moss, Wem. [X0827]

**C**ONSULT Rex Mundy before purchasing a new or second-hand A.J.S.—See "Consulting Engineers" column. [9505]

## Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone—766.

Telegrams—"Perfection."

### NEW 1916 MODELS.

LEVIS, 2½ h.p., 2-stroke	£32 0
SUNBEAM, 3½ h.p., 3-speed	£73 10
SUNBEAM, 5 h.p., 3-speed, twin	90 gns.
EXCELSIOR (American), 7 h.p., 3 speeds	£75 0
CALTHORPE (Almor), 2 seater	185 gns.
MORGAN, M.A.G. engine, and accessories	£113 13
MORGAN, de luxe, and accessories	£117 18
NEW IMPERIAL, 2½ h.p., 2 speed	£36 15
NEW IMPERIAL, 2½ h.p., variable magneto	£37 18

DOUGLAS MODELS.—Orders booked now.

## EXCELSIOR,

1916, 7 h.p., 3-speed model, 84×89, countershaft gear, chain drive, mechanical and hand lubrication, high-tension magneto, multiple-disc clutch with dual control, kick starter, 2 gallons petrol capacity; £75.

Exchanges quoted.

Sole Yorkshire distributors. Trade supplied.

### NEW 1915 MODELS.

DOUGLAS, Model V, 2-speed	£50 8
*CONNAUGHT, 2½ h.p., 2-speed	£41 16
*WOLF-J.A.P., 2½ h.p., 2-speed	£37 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed	£39 10
*ROYAL RUBY, 6 h.p., 3-speed	£87 0
EXCELSIOR, 7 h.p., dynamo lighting, etc.	£71 10

\*Cash offers wanted.

## PERFECTION SIDECARS

to suit American Excelsior and Harley-Davidson machines, 28×3 Dunlop tyre, grey coach-built body and chassis

£13 10

### SOLO MACHINES.

1915 4½ h.p. 2-speed LINCOLN-ELK, as new	£37 10
1913 3½ h.p. ROVER, 3-speed	£37 10
1913 3½ h.p. ROVER, Grado gear	£37 10
1913 3½ h.p. RUDGE Multi	£34 10
1912 3½ h.p. 2-speed F.E. BRADBURY	£29 10
N.S.U., 3½ h.p., 2-speed, spring forks	£19 19
EXCELSIOR, 3½ h.p., 3-speed, Druid forks	£19 19
2½ h.p. 2-speed DOUGLAS	£23 10
8 h.p. 3-speed CHATER-LEA	£19 19
1910 3½ h.p. tourist TRIUMPH	£12 10
KERRY, 3 h.p., magneto, Saxon forks	£12 10
5½ h.p. magneto REX, spring forks	£15 10
N.S.U., twin, 2-speed, spring forks	£14 10
TRIUMPH, 3 h.p., magneto, spring forks	£9 13
MOTOSACOCHE, magneto, lightweight	£9 13

£145 RITZ LIGHT CAR. £145

The last word in light car values; 10 h.p., 4-cylinder, mechanical lubrication, electric horn and lighting, hood, screen, tools; luxuriously sprung, and a grand top gear car. Deliveries from stock. Trial runs by appointment. Exchange liberally catered for.

### SIDECAR COMBINATIONS.

Brand new 1914-15 6 h.p. REX Sidette	£69 10
1914 3½ h.p. 3-speed ARNO and Sidecar	£36 10
1914 6 h.p. REX Sidette	£53 10
W.C. WILLIAMSON and Sidecar (new)	£89 15
1912 3½ h.p. 2-speed twin PREMIER and smart coach-built Sidecar	£34 10
1913 6 h.p. 2-speed F.E. REX, chain drive, smart coach Sidecar	£43 10
1913 RUDGE Multi and Sidecar	£38 10
1913 7-gp. QUADRANT and Sidecar	£49 10
1913 ROVER 3½ h.p. 3-speed Combination	£43 10
1912 3½ h.p. 2-speed PREMIER and Sidecar	£33 10
1910 3½ h.p. 2-speed REX and Sidecar	£24 10
6 h.p. 2-speed V.S. and Sidecar	£23 10

### MISCELLANEOUS.

New 8 h.p. W.C. WILLIAMSON Cy-cl-ca.	£126 0
MORGAN, 1914, sporting, hood, screen, etc., repainted 1916 style, very smart	£82 10
PREMIER 7-gp. 2-seater Light Car	£58 10
New 1916 5-seater OVERLAND	£275 0

WANTED—Second-hand Douglas, for cash.

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**19**16 4 h.p. A.J.S., delivery promised second week of February; £76.—Crow Bros., 190, High St., Guildford. [9404]

**A** J.S., 1913, 6 h.p., and sidecar, all accessories, perfect condition; any trial; £55.—16, Weldon Crescent, Harrow. [X0804]

**A** J.S. 6 h.p. Combination, Dec., 1914, spare wheel complete, new tyres, excellent condition; £75.—Davis, 67, Victoria St., Wolverhampton. [X0925]

**19**15 4 h.p. A.J.S. and 16 gn. Montgomery sidecar, complete with speedometer, Lucas head, rear, and side lamps; £72.—Box 9,991, c/o The Motor Cycle. [X0678]

**A** J.S., 1915, 4 h.p. twin, 3-speed, clutch, chain drive, lighting set, Klaxon, accessories, 900 miles, splendid condition; £59.—Crow Bros., Guildford. [9342]

**19**15 6 h.p. A.J.S. Combination, absolutely in stock; this luxurious outfit complete only costs £102/10; exchanges, easy terms.—Julian, Broad St., Reading. 'Phone, 1024. [X1485]

**A** J.S. Combination, 1914, hood, screen, speedometer, A Broit electric lighting set, 3 lamps—electric horn, tyres in good condition, tools and spares, perfect; 70 gns.—Holt, Flaxley Rd., Stechford, Birmingham. [X1001]

**6** h.p. A.J.S., 1914, 3-speed countershaft gear and free engine, fitted with Gloria sidecar, fitted with Lucas lighting set, Lucas horn, rear light, tools, and spares; any severe trial given; mechanically sound, as new; 70 gns.; rare opportunity.—Wauchope's, 9, Shoe Lane, London. [X0872]

### Alldays.

**A** LLDAYS Allon, 2-speed model, in stock.—Jones, Garage, Droitwich. [X0372]

**A** LLDAYS: immediate delivery these grand machines.—W. P. Edwards, Taunton. [X9969]

**A** LLDAYS 4 h.p. Combination, 1913, speeds, Bosch, new tyres; cheap; exchanges.—4, Park Rd., Edmonton, N. [9429]

**A** LLDAYS Allon, all models: immediate delivery; easy terms 2% extra.—Referee Cycle Co., 352, High Holborn. [0765]

**A** LLDAYS Allon, 1916, 2-speed, new, slightly soiled; list price £42, accept £38; exchange.—Ideal Cycle Co., Thundersley, Essex. [9538]

**A** LLDON, 2-stroke, late 1915, only done 300 miles; cost £42, complete, best offers.—Epoce, c/o Davis and Capel, 84, Houndsditch, London, E.C. [9182]

**F**OR SALE, perfectly new 2-speed gear Allon motor cycle, with hand-operated clutch; price £40.—Appl. Denis Best, Temple Laugharne, Worcester. [8974]

**N**EW Allons, 2-speed models £42, single-speed models £34; delivery from stock; cash or extended payments.—Wauchope's, 9, Shoe Lane, London. [X0873]

**19**15 1½ Allon, 2½ h.p., 2-stroke, 2-speed, P. and H. lamps, splendid bargain; first cheque over £30 secures.—E. J. W. Matthews, A. B. Ramsay's Esq. Eton College, Windsor. [9525]

### Ariel.

**A** RIEL, 1914, 3½ h.p., 3-speed hub and clutch, all accessories, new condition; £42.—Montgomery, Victoria Rooms, Bristol. [X0842]

**A** RIEL, 3½ h.p., 1912, variable geared, new tyres, perfect order; £24, or nearest.—Gilbert, 30, Edgemont Gardens, Langside, Glasgow. [X0786]

# Sidecar Combinations

for  
**LADIES and GENTLEMEN.**  
IN STOCK.

4½ h.p. 3-sp. JAMES Combination	£80 10
6 h.p. A.J.S. Combination	£102 18
3½ h.p. SUNBEAM Combination	£65 0
4 h.p. TRIUMPH 3-speed Combination	£55 0
6 h.p. A.J.S. Combination	£60 0
3½ h.p. TRIUMPH 3-speed Combination	£48 0
3½ h.p. TRIUMPH 3-speed Combination	£45 0

## SOLO MOUNTS.

3 h.p. ROYAL ENFIELD, twin	£52 15
2½ h.p. A.J.S., T.T.	£58 0
2½ h.p. A.J.S., touring	£58 0
3½ h.p. T.T. ROVER, Philipson	£56 0
3½ h.p. T.T. NORTON	£46 0

## TWO-STROKES.

T.T. SPARKBROOK	£40 0
T.T. IXION	£28 10
JAMES, 2-speed	£38 10
Lady's METRO, 2-speed	£38 10
IVY, single-geared	£29 10
ROYAL RUBY	£29 10
HOBBART, 2-speed	£38 10
SPARKBROOK, 2-speed	£40 0
EXCELSIOR, single-geared	£30 16
LEVIS, 2-speed	£44 0
IXION	£28 10
OMEGA, 2-speed	£38 10

## SECOND-HAND MACHINES, OVERHAULD.

1915 IVY, 2-stroke, like new	£22 0
1914 3½ h.p. T.T. SINGER, lamp & horn	£38 0
1915 5 h.p. T.T. INDIAN, 3-speed, like new, complete with lamp	£62 0
1915 IXION, 2-stroke, nearly new	£26 0
1914 IXION, 2-stroke	£22 0
1914 4½ h.p. 2-sp. countershaft SINGER, complete with lamp, etc., like new	£45 0
1911 T.T. TRIUMPH, just renovated	£25 0
1913 6 h.p. A.J.S. Combination, perfect order	£60 0
1913 6 h.p. REX, F.E., fine order	£25 0
1911 2½ h.p. ROYAL ENFIELD, twin, magneto, etc., splendid order	£13 0
1916 SCRIPPS-BOOTH 1½ h.p. 2-seater, yellow and black finish, absolutely like new, only done 400 miles	£250 0
1915 SAXON 2-seater, Stepcy, etc., like new	£100 0

LUCAS 341 Lamp Sets	£2 2 0
STEWART Speedometers, from stock	£2 10 0
JUNIOR Long Horns, from stock	£1 5 0
F.R.S. Lamps, big sets	£3 8 6
F.R.S. Lamps, major sets	£3 18 6
F.R.S. Lamps, Douglas sets, from stock	£2 0 0

**WE STOCK  
AND  
RECOMMEND  
PEDLEY  
BELTS**

**The North Wales  
Motor Exchange,  
HOLT STREET, WREXHAM.**

Telephone: 283.  
Telegrams: "Motor Exchange, Wrexham."

## MOTOR CYCLES FOR SALE.

Douglas.

4 h.p. 3-speed 1915 Douglas, only run 1,500 miles. 2 speedometer, lamp, horn, complete, guaranteed; £55.—Brook Motor Cycles, Burnham, Sou. [8577]

DOUGLAS, late 1913. 2½ h.p., 2-speed, very fast, perfect condition; £30, no offers; seen any time by appointment.—Tunbridge, Little Waltham, Chelmsford. [9307]

1914 3-4 h.p. T.T. Douglas, 2-speed, new tyres, speedometer, head light, belt case, mechanical horn, all in good condition; £40.—109, St. Michael's Rd., Aldershot. [9295]

DOUGLAS, 1914. 2½ h.p., twin-cyl., 2-speed, kick starter and clutch, lamp, horn, and tail lamp, appearance as new; £35.—The Premier Motor Co., Aston Rd., Birmingham. [9500]

DOUGLAS, Douglas, Douglas.—Write us your requirements. We can supply all latest models to be had.—Alexander's, Scottish wholesale and retail agents, 115, Lothian Rd., Edinburgh. [8254]

DOUGLAS, 3½ h.p., new May, 1915, only travelled 2,800 miles, perfect condition, complete with speedometer, lamp, tools; £44.—Mysou, 89, Cromwell Rd., South Kensington, London. [9201]

DOUGLAS, 1913, 2½ h.p., 2 speeds, clutch, etc., perfect condition, nearly new tyres, a bargain, first cheque for £30: a 1914 similar model, £36.—Colmore Depot, 62, High St., Leicester. [9244]

DOUGLAS.—Immediate delivery models U, V, W. Book four orders now from the sole agent for Anglesey and Carnarvonshire. Tel.: No. 5.—Jones, Anglesey Motor Mart, Llanfairpwll. [X9486]

DOUGLAS, 1913, 2-speed, clutch, not done 1,000 miles, in splendid condition throughout, not been ridden since August, 1914; just been empowered to sell, £35/10.—Moore, Motors, Andover. [9310]

DOUGLAS, late 1914, 2½ h.p., 2-speed, kick starter, clutch, P. and H. lighting set, Lucas horn, Lyett's pan saddle, spares, and tools, perfect condition; £36.—Red House, Grazeville Rd., Sidcup. [9280]

1914 Douglas V, clutch, kick start, excellent tyres and belt, Bosch mag., Lucas horn, knee-grips, engine thoroughly overhauled, guaranteed perfect; £40.—Robinson's Garage, Green St., Cambridge. [0649]

DOUGLAS Models U, W, and War Office delivered at once; also 1913 2-speed kick starter, with heap accessories, 35 gns., bargain.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9273]

DOUGLAS Model U, £50/8: Douglas Model V, £50/8: War Office Model, £54/12: Douglas Model W, £56/14: Douglas Model X, £56/14.—Above models actually in stock at Sole Wholesale and Retail Midland Distributing Agents, Colmore Depot, 31, Colmore Row, Birmingham. [X2344]

DOUGLAS T.T., 2½ h.p., late 1915, special racing engine and long exhaust, oversize tyres, 2-speed and free engine, Lucas lamp and generator, Lucas cyclorn, all accessories, run few hundred miles, quite perfect; owner bought car; £45.—Horton, Langwell, Avr. [X0949]

Dreng.

DRENG Lightweight Motor Cycles, 27 gns.; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8589]

Dunkley.

DUNKLEYS.—All models from £35 to £89/5; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [9238]

Enfield.

1916 Enfield 6 h.p. Combination in stock.—Tilley, The Esplanade, Weymouth. [X0995]

ROYAL Enfields, 1915, second-hand 6 h.p. combinations, from £70; trial run.—Below.

ROYAL Enfields, new 1916 combinations; £89/5, in stock; exchanges; beginners taught free.—Below.

ROYAL Enfields.—For Woolwich, Plumstead, Greenwich, Blackheath, Charlton, North Woolwich, and Silverton, sole district agent, W. Hill, 20, High St., Woolwich. [X9587]

2½ h.p. Twin Royal Enfield, good condition; £15.—24 Bridger, Roslyn, Miltord, Surrey. [9395]

ENFIELD, 1915, T.T. model, lamps, and horn, like new; £42.—94, Gloucester Rd., S. Kensington. [9205]

ENFIELD 3 h.p. Twin, perfect condition, accessories; £40, offers.—Matthews, K.O.V.L.L., Rugerly Camp. [X0859]

ENFIELD 1915 Combination, 6 h.p., mag., magnificent turnout; £65.—1, Ebner St., Wandsworth. [X0931c]

ENFIELD, 3 h.p., 1915 (November), small mileage, E.C. lamps, horn, etc.; £45; perfect.—1, Brackley St., E.C. [X0378]

1915 3 h.p. Enfield, and accessories, perfect condition; £44; seen any time.—223, High Rd., Kilburn. [9469]

CONSULT Rex Mundy before purchasing a new or second-hand Enfield.—See "Consulting Engineers" column. [9508]

6 h.p. Twin Enfield Combination, used for pleasure only, fine condition; £42, bargain.—Daley Bank, Matlock. [X0805]

# SPECIAL SNIP!

Light Cycle Car Chassis, new 26×2½ in. (tyres, wheel steering, 2-speed gear box, tank, etc.; the lot, £12. Tyres almost worth it.

## THE FOLLOWING ARE ACTUALLY IN STOCK:

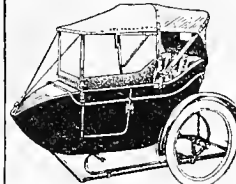
1916 8 h.p. EXCELSIOR Combination, Jardine 4-speed gear	£98 0
1916 4½ h.p. B.S.A., 3-speed, Model K	£52 0
1916 Grand Prix MORCAN No. 1, speedometer, etc.	£120 0
1916 Sporting MORGAN, all on	£109 0
1916 6 h.p. NEW HUDSON	72 gns.
1916 FORD Touring Car, 20 h.p.	£135 0
1916 FORD Chassis, 20 h.p.	£115 0
1916 FORD Van, 20 h.p.	£130 0
1916 20 h.p. FORD Ambulance	£135 0
1916 6 h.p. ENFIELD Combination	85 gns.
1916 6 h.p. J.H. Combination	90 gns.
1916 5-6 h.p. EXCELSIOR, Sturmer 3-speed countershaft gear	68 gns.
1916 4½ h.p. EXCELSIOR, Sturmer 3-speed countershaft gear	64 gns.
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on	£120 0

## SECOND-HAND BARGAINS.

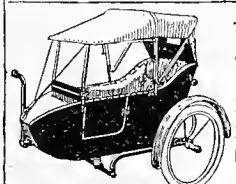
1913 B.S.A., 2-sp., chain drive, kick starter, and smart coach-built Sidecar	£35 0
1915 2-sp. 2-str. NEW HUDSON, done 500	28 gns.
3½ h.p. 1909 REX de Luxe, 2-sp., handle st'g	£19 0
6 h.p. ZENITH, clutch model, and Sidecar	£40 0

## FARLOW SIDECARS.

Built throughout in our own factory. Farlow Sidecars have that pleasing style, exquisite finish, and lasting qualities which are the buyer's ideal.



MODEL 3.  
Underlung Chassis, with Luggage Carrier combined.  
Splendidly made and built for hard work.  
£10 15 0  
Hood £2. Screen £1.



This is MODEL No. 1.  
A BEAUTIFUL LIGHT  
SIDECAR.  
PRICE: 9 Guineas.  
Hood £2. Screen £1.  
Delivery from Stock.  
Your Agent will supply



## NEW MOTOR CYCLE FRAMES.

Fully Guaranteed.  
25/- each.

## ODD BARGAINS.

8-10 h.p. Precision Engine, quite new. What offers?	
6 h.p. Twin Antoine Engine, water-cooled	£6 0
8 h.p. J.A.P. Twin Engine, air-cooled	£12 12
New Binks Carburetter, car model	35/-
New Binks Carburetter, motor cycle type	35/-
F.R.S. Lamp Set, 500 beam, shop-soiled	36/-
F.R.S. Lamp Set, 1,000 beam, shop-soiled	45/-
New Clincher Clearance Covers, de Luxe, "heavy," rubber-studded, 26×2½, 26×2½, 26×2½, and 26×2½×2½	25/-
Latest Mechanical Horn, black and nickel	£1 0
Cowey Speedometer, for 26×2½ wheel	£2 0
Cowey Speedometer, for Morgan	£2 5
Set of Miller's Cycle Car Lamps and Generator (new)	£3 0
Lukin Cycle Car Carburetter, new condition	15/-
Cox Cycle Car Carburetter	10/-

## FARRAR'S MOTORS

(Telephone 919),  
Hopwood Lane, HALIFAX.

## MOTOR CYCLES FOR SALE.

## Enfield.

ENFIELD Twin, 2½ h.p., new tyre, enamel good, 2 lamps, horn; 15 gns.—Troward, Heathurst, Vale, Hampstead. [9523]

ENFIELD, 1915, 3 h.p., 2-speed, twin, Lucas horn, speedometer, watch and holder, lamp set, rear lamp, perfect; £44.—Below.

ENFIELD 1916 6 h.p. Combination; 85 gns.; delivery from stock; exchanges.—D. J. Shepherd and Co., Enfield Highway. [9486]

1914 6 h.p. Royal Enfield Sidecar Combination, complete with accessories; £59; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X0879]

ENFIELD 6 h.p., 1916 Combinations, delivery from stock; price £89/5, or deferred payments.—Layton's Garage, Bicester, Oxon. [X0954]

1915 Enfield, 3 h.p., 2-speed, model 140, new, but slightly shop-soiled; list price £52/10, going at £45.—Alexander's, 115, Lothian Rd., Edinburgh. [8255]

ROYAL Enfield 6 h.p. Combination, coachbuilt sidecar, good condition, complete with accessories, etc.; £50; late 1915.—W. J. Connell, Budleigh, Salterton. [X0760]

ENFIELD Twin, T.T., new chains, tyres, panniers, etc., P. and H. lamps, painted grey, good condition; £20.—M., c/o Goring, 3, Tudor St., London, E.C. [9286]

1912 6 h.p. Enfield, special wide coachbuilt sidecar to seat 2, accessories, etc.; £45, cash or easy terms.—E. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0722]

1915 Enfield 2-speed, 2-stroke, Lucas horn, P. and H. lamp set, all tools, absolutely in new condition; £34.—Harvey, Hudson and Co., South Woodford. [X0846]

ENFIELD Combination, late 1914, splendid condition; price, including spares, £60; seen any time.—3, The Parade, Twickenham Rd., Isleworth. [9344]

ROYAL Enfield, 3 h.p., 1915, not ridden 250 miles, complete with all accessories, scarcely discernible from new, Palmers both wheels; price £42/10/6, good bargain.—Wauchope's, 9, Shoe Lane, London. [X0878]

1915 Enfield, 6 h.p., coachbuilt sidecar, speedometer, horn, Major F.R.S. set, side and tail lamps, spares, etc., as new; owner enlisted; a bargain, £70; only trial.—9, Hatherley Gardens, Crouch End, N. [9441]

ROYAL Enfield, 1916 models in stock; 8-strokes, 3 h.p., twin, and 6 h.p. combinations, also De Luxe combination, with Lucas lighting set, etc.; prices from 40 gns.—P. J. Evans, John Bright St., Birmingham. [9491]

ENFIELDS, 1916 models in stock; 2-strokes, 3 h.p., twins, and 6 h.p. combinations, also De Luxe combination, with Lucas lighting set, etc.; prices from 40 gns.—P. J. Evans, John Bright St., Birmingham. [X0760]

23 h.p. Royal Enfield, up-to-date machine, 2 speeds and free engine, countershaft gear, complete with high-class accessories, and speedometer, 100 miles to the gallon; £27/10; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X0895]

1915-1916 6 h.p. Enfield Combination, lamp, generator, and horn, only used 3 times, bought in November, costing £92, would pass for new; owner enlisted; £74.—Alexander and Co., 115, Lothian Rd., Edinburgh. [8253]

1913 Enfield and sidecar, complete with lamps, horn, speedometer, done 4,000 miles, beautifully kept, in absolutely spotless condition; 42 gns.—Julian, Broad St., Reading. Biggest motor cycle and light car dealer in the South. Phone: 1024. [0770]

ENFIELDS Actually in Stock; De Luxe model, electrically equipped, 100 gns., standard combination, 85 gns.; 3 h.p., 2-speed solo mount, 50 gns.; also 1913, very fine order, £45; good prices allowed for second-hand Enfields in part exchange; liberal deferred payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9260]

ROYAL Enfield New Combinations, 6 h.p., chain-drive machines, fitted with handsome coachbuilt sidecar, countershaft gear and free engine, up-to-date turnout, complete with storm apron; 85 gns.; tuition free, and free delivery to any address within 50 miles of London; best terms for cash, exchange, or extended payments.—Wauchope's, 9, Shoe Lane, London. [X0880]

## Excelsior.

1916 Excelsior (British), 8 h.p., J.A.P., Jardine 3-speed gear, Mills-Fulford Empress sidecar, Lucas dynamo lighting set; £112, complete.—Below.

1916 Excelsior (British), 2-stroke; £30/16.—W. Brandish, the Triumph Garage, Foleshill Rd., Coventry. [X8949]

EXCELSIOR (American), 7.9 h.p., 3-speed model, quite new; usual price £75, accept £58, or deferred payments.—Layton's Garage, Bicester, Oxon. [X0955]

AMERICAN Excelsior, 1916 model, £75, De Luxe £85; immediate delivery. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Mears, Greco Taxis, Villiers St. Garage, Charing Cross, London. [8597]

## Fafnir.

FAFNIR, 3½ h.p., very fast, perfect condition, ready to ride away; bargain, £7.—4, Berenstord Terrace, Petherton Rd., N. [9382]

## Those Springs

—the Springs of the famous DRUID MARK II.—mean all the difference between a complete and part Efficiency—between your complete comfort and satisfaction and partial comfort and dissatisfaction.

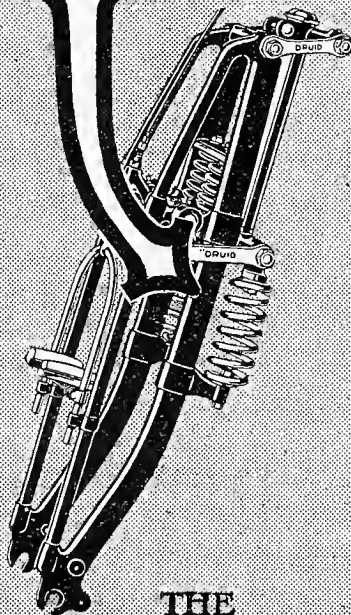
Bear well that fact in mind, and, whether 1916 will find you riding new machine or old, see to it that the Fork fitted is the

## DRUID MARK II

—the ONLY Spring Fork which embodies the CORRECT "Design-principle"—the ONLY Fork which totally absorbs WITHIN ITSELF every kind of shock both Vertical and Horizontal, and the ONLY Fork which will ensure your continuous comfort under all road conditions.

Ask your Agent about the DRUID—or write the makers direct for full particulars.

A. DREW & CO., LTD.,  
Leopold Street,  
BIRMINGHAM.



THE  
DRUID  
MARK II  
SPRING FORK

## MOTOR CYCLES FOR SALE.

## F.N.

F.N., 2½ h.p., nearly new; £20; seen after 7.—Chitty, 133, Sandhurst Rd., Catford. [9457]

F.N. Lightweight, 2½ h.p., 2 speeds, clutch, etc.; bargain, £14.—Earl, 5, Heath St., Hampstead. [X0929]

F.N., 1914, 5.6 h.p., perfect order, any trial; £25; between 3-5 p.m., Saturday.—69, Hamlet Gardens, Hammersmith. [9366]

F.N., 2½ h.p., 2-speed, handle-bar clutch, speedometer, lamps, all accessories, new tyres, perfect condition; £24.—28, Howard Rd., Walthamstow. [9290]

## Harley-Davidson.

HARLEY-DAVIDSONS in Stock.—Premier Motor Co., Birmingham.

MODEL 11J, with dynamo electric lighting; £76/13, duty free.—Premier Motor Co., Birmingham. [8684]

HARLEY-DAVIDSON Models in stock, complete with Gloria sidecar.—Turpin, 22 and 29, Preston Rd., Brighton. [0713]

HARLEY-DAVIDSON, late 1914, large lamps, speedometer, watch, 2-speed, kick start, and 2-seated sidecar, guaranteed perfect; £50.—45, Bow Common Lane, Bow, E. [9439]

HARLEY-DAVIDSON, nearly new, 11J model, 3-speed, electric light, speedometer, spare tyre, Coronet sidecar; special bargain, £70.—Larkhill Garage, Larkhill Camp, Salisbury. [8914]

HARLEY-DAVIDSON, not done 300 miles, Northern 14 gns. sidecar, streamline body, front and rear lamps, horn, etc., as new; £70.—W. Brandish, the Triumph Garage, Foleshill Rd., Coventry. [X8950]

HARLEY-DAVIDSON, purchased Feb., 1915, 2-speed, kick start, Low generator, F.R.S. lamp, Stewart horn, Mackenzie coachbuilt sidecar; trial; guaranteed perfect; £55, or offer.—Watson, Foresters Arms, Brady St., Whitechapel. [9438]

HARLEY-DAVIDSON, 1916 models, now in stock; model 16F, 7.9 h.p., 3-speed, £80/15; model 16J, with dynamo electric lighting outfit, £89; order now for early delivery. Sole agents for Warwickshire, Worcestershire, and Staffordshire.—The Premier Motor Co., Astor Rd., Birmingham. [9501]

HARLEY-DAVIDSONS.—Bargains at the Colmore Depot, only two left at these prices, then £10 advance, as elsewhere. Model 11C, 4 h.p., 2 speeds, etc., £58; model 11J, 7 h.p., twin, 3 speeds, electric lighting, etc., £76; sidecars to match from £13/15.—Colmore Depot, 62, High St., Leicester. [9243]

HARLEY-DAVIDSON, model 11F, delivered Oct., 1915, with special coachbuilt Bramble sidecar, lamps, and Stewart mechanical horn, P. and H. lamp set, used by officer for fortnight; cost over £100, accept £85.—Can be seen and tried at any time at Parker's Garage, St. Ives, Hunts. [9462]

HARLEY-DAVIDSON.—For careful attention to your requirements, and best terms, get in touch with the firm who introduced the "Silent Grey Fellow" in the Midlands. A few models 11J, with electric dynamo lighting equipment, head lamp, tail lamp, and horn, free of duty, £75/5. Buy now and save money.—The Premier Motor Co., Aston Rd., Birmingham. [8685]

1915 (September) Harley-Davidson, model 11J, electrically equipped, Stewart trip speedometer, with Millford Empress sidecar, fitted with storm apron, luggage board, and Dunhill's 43 triple wind screen, cycle has only done 750 miles; sidecar has not been 100, combination perfect; cost £110, sell £84; would take lightweight in part payment.—A. H. Ellis, The Haven, Wivenhoe, Essex. [9389]

## Hazlewood.

1914 5.6 h.p. Hazlewood Combination, fitted with 3-speed countershaft gear, kick start, etc., also Lucas King of the Road lamp, horn, tools, etc.; only £50; in splendid condition.—Wooten's, 55, High St., Oxford. [9355]

HAZLEWOOD-J.A.P. Combination, about 1914-15; 5.6 h.p., countershaft, 3-speed, kick start, coachbuilt underslung sidecar, beautiful turnout, speedometer, lamps, tools, etc., must sell immediately; £38/10, near offer.—Speechley, 45, Church Rd., Acton. [X0986]

## Henderson.

1914 8 h.p. 2-speed 4-cyl. Henderson Motor Cycle, fitted with sporting Swan coachbuilt sidecar, in splendid condition, equipped with Lucas lamp, horn, speedometer, tools, etc.; only £65, a bargain.—Wooten's, 55, High St., Oxford. [9356]

## Hobart.

HOBART, 1915, 2½ h.p., 2-stroke, 95 m.p.g., good condition, hardly used, owner enlisted; £25.—Thompson, 20, Balacala Rd., Cardiff. [X0941]

## Humber.

HUMBER, 3½ h.p., with Roe gear; £24.—248, Bishopsgate, London. [9349]

3½ h.p. Humber and sidecar, 2-speed, good condition; £22.—223—Bridge, Roslyn, Milford, Surrey. [9394]

2 h.p. 1912 Humber, excellent order, lamp and accessories; trial; £16.—56, Solent Rd., West Hampstead. [X0683]

HUMBER, 3½ h.p., with wicker sidecar, 3-speed, free engine, perfect order; £42/10.—Sayce, Guisfield, Walspool. [X0767]



## MOTOR CYCLES FOR SALE.

## New Imperial.

NEW Imperials, delivery 1916 models from stock; prices from 35 gns.—P. J. Evans, John Bright St., Birmingham. [9495]

NEW Imperial-Jap, 2½ h.p., 1915, £26; Cowey speedometer, perfect, 27/; 6 volt dynamo, £3-17, Oxford St., Reading. [X0727]

NEW Imperial, 1915, 2½ h.p., 2-speed, with lamp and horn, good condition, and very fast; £28, no offers.—Thompson, 294, High St., Watford. [9186]

NEW Imperial, delivery from stock of the 2½ h.p. J.A.P.-engine 2-speed model; £36/15, or deferred payments.—Layton's Garage, Bicester, Oxon. [X0957]

NEW Imperial, 1914, J.A.P. engine, 2-speed counter-shaft gear, Lucas lamp set, rear light, and horn; £23/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0479]

2½ h.p. New Imperial-Japs, latest models, just delivered, 2-speed and free engine, an ideal lightweight; £36/15; cash, extended payments, or exchange.—Wauchope's, 9, Shoe Lane, London. [X0883]

1915 New Imperial, No. 2 model, with 2-speed gear, clutch, and kick starter; 32 gns., very great bargain.—Julian, Broad St., Reading. Biggest motor cycle and light car dealer in the South. Phone: 1024. [0773]

## New Ryder.

1915 New Ryder, 2-stroke, complete, new last May; £18 lowest.—27, Bedford Rd., Clapham. [9346]

NEW Ryders.—We stock all models.—Apply for catalogue (sole agent), Motor Mart, 25, Greenside Place (3 minutes from G.P.O.), Edinburgh. [X0008]

## Norton.

1914 T.T. Norton, lamps and horn, very fast; £32.—Wilkin, Hunter's Bar, Sheffield. [9445]

NORTON, 1914½, T.T., in first-class condition, very fast; £38.—Capt. Cookson, Esplanade Hotel, Lowestoft. [9232]

1916 3½ h.p. 3-speed Countershaft Norton, 62 gns.; also several Nortons in stock, £45.—Parker and Son, St. Ives, Hunts. [9461]

NORTON, 1915, new June, T.T. model, with Philipson pulley, all accessories, as new; £42 cash.—Longman, Fisherton, Salisbury. [X0758]

NORTONS, 1916 models in stock; Brooklands road special, T.T. model, sporting countershaft, and De Luxe combinations.—P. J. Evans, John Bright St., Birmingham. [9496]

1915 T.T. Norton, with Philipson pulley, complete with lamp, Klaxon horn, etc.; cost £59/10, to be cleared at £45, very great bargain.—Julian, Broad St., Reading. Biggest motor cycle and light car dealer in the South. Phone: 1024. [0774]

## N.S.U.

1913 N.S.U., 2½ h.p., spring frame, Grado gear, speedometer, Kempshall tyres; £18.—3, Barnsbury St., Islington. [9417]

## N.U.T.

N.U.T., 1915, 4-5 h.p. twin, 3 speed, excellent condition throughout; £62; exchanges.—Ideal Cycle Co., Thundersley, Essex. [9339]

N.U.T.'s.—All models from £53/11 to £78/15; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8592]

6 h.p. N.U.T., with sidecar, dark brown, upholstered leather, 3-speed, J.A.P. engine, bought January, 1915, has only done 1,000 miles, as owner has been at front most of time, lamps, complete, tyres in good condition; can be seen by appointment; price £65, or near offer.—Al. E. T. Cleaver, 2, Vineyard Hill, Wembley, London, S.W. [9200]

## O.K.

O.K., 1914, 2½ h.p., 2-speed, perfect; bargain, £22.—Newham, 223, Hammersmith Rd., W. [9361]

O.K., 1915, 2-stroke, 2-speed, practically new; £24.—Roberts, 78, St. John's Rd., Tunbridge Wells. [9187]

1916 O.K. Juniors, in stock; 2-stroke £27/10, 2½ h.p. J.A.P. 2 speeds £38.—Cross, Agent, Rotherham. [X0864]

O.K. Junior, 1915, 2-speed, countershaft, splendid condition, very little used; original price £33/10, to be cleared at 20 gns; this is without doubt the cheapest machine in England to-day.—Julian, Broad St., Reading. Biggest motor cycle and light car dealer in the South. Phone: 1024. [0772]

## P. and M.

P. and M., 1913, 2-speed, 3½ h.p., perfect, £35; also 1909 2-speed.—39, Belmont Park Rd., Leyton. [9503]

1914½ Phelon-Moore Combination, fully equipped; sacrifice, £49/10.—Abson, 49, Kirkgate, Wakefield. [X0861]

P. and M. Combination, late 1914 model, 3½ h.p., chain drive, 2-speed countershaft gears, Lucas lamp, horn, and spares, new Burberry coachbuilt sidecar, in perfect condition; £50.—Meekin's, Stationer, Epsom. [9197]

P. and M., late 1913, 2-speed, kick starter, with accessories, 40 gns.; splendid order; deferred payments, quarter down and balance in 12 monthly instalments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9266]

# LAMB

of WALTHAMSTOW

151, HIGH STREET.

Phone: Walthamstow 169.

And 50, High Rd., Wood Green, N.

EXCHANGE your present machine for a new one; liberal allowance made.

DEFERRED PAYMENTS on the easy and simple plan of quarter down and balance in 12 monthly instalments.

SUBSTANTIAL DISCOUNTS in one, three, and six months.

## 1916 MODELS IN STOCK.

ENFIELD 6 h.p. Combination	£89 5
ENFIELD electric Combin'n de luxe	£105 0
B.S.A., Model K, and No. 1 Sidecar	£78 0
B.S.A., Model H	£64 0
JAMES 4 h.p. Combination	£80 10
INDIAN, Model B, and Sidecar	£85 15
INDIAN, Powerplus, G	£75 0
INDIAN, Model F, electric	£75 0
NEW HUDSON, Model C, 2-stroke, 2-speed, lightweight	£38 0
NEW HUDSON Big Six Combination, fawn finish	£92 8
NEW HUDSON 4 h.p. 3-sp. Combin'n	£78 15
CALTHORPE-J.A.P., 2-sp., latest mod.	£37 16
IMPERIAL-J.A.P., 2½ h.p., 2-speed	£36 15
LEVIS, Popular model	£32 0
LEVIS, No. 1, with Enfield gear	£47 10
DOUGLAS, Model U, 2-sp., footboards	£50 8
DOUGLAS, Model W	£56 14
DOUGLAS, War Office	£54 12
DOUGLAS, Model V	£50 8
ARIEL 5-6 h.p. 3-sp. c/shaft Combin'n	£93 10
ARIEL 3½ h.p. 3-sp. Combination	£80 7
QUADRANT, belt and chain	£72 10
HOBART, 2-speed, 2-stroke	£36 0
ALLDAYS ALLON, 1915, single-speed, 2-stroke	£34 0
CONNAUGHT, 1915, 2½ h.p., 2-stroke	£35 3 6
LEVIS, 1915, No. 1	£36 17
LEVIS, 1915, Popular model	£28 1
ENFIELD, 3½ h.p., 2-speed	£52 10
HARLEY-DAVIDSON, Model J	£89 0
HARLEY-DAVIDSON, Model F, and H.-D. Sidecar	£101 15

## SECOND-HAND OUTFITS.

1913½ P. & M., 2-speed, kick starter, in beautiful order	£42 0
1914 CLYND 3-speed Combinat'n 2-seater Sidecar, accessories	£69 10
1912 NEW HUDSON, 2½ h.p., 3-speed, pedal starter, all accessories	£25 0
1915 NEW HUDSON, Sturmev-Archer Combination	£59 10
1913 DOUGLAS, 2-speed, kick starter, lamp, horn	£36 15
1914 LEVIS de luxe, 2-sp., new tyres, accessories	£27 10
1915 INDIAN, 5 h.p. Model B, 3-speed, semi-T.T. bars, kick starter, two months old, condition like new	£57 15
1914 TRIUMPH, 3-speed, pedal starter, new tyres, Lucas accessories	£49 10
1913 TRIUMPH, 3-sp., Clincher tyres, all accessories	£41 10
1912 B.S.A., clutch model, and access.	£30 0
1913½ B.S.A., all-chain drive, and acc.	£42 0
1915 NEW HUDSON Sturmev-Archer Combination	£59 10
1913 ENFIELD 2-speed coach Comb'n	£45 0
1913 ZENITH 8 h.p. Combination	£66 3
1914 BRADBURY 6 h.p. 3-speed Com	£36 15
1912 BRADBURY, 3½ h.p., 2-speed, Sc.	£47 5
1913-14 BAT-J.A.P., 8 h.p., cane Sc.	£31 10
1912 BAT-J.A.P., 5-6 h.p., wicker Sc.	£20 0
1910-11 TRIUMPH, single gear	£20 0
1914 AUTO-WHEEL, with Cycle and Sidecar	£16 16

## SECOND-HAND CARS.

1914-5 MAXWELL, 18-22 h.p., 5-seater	£140 0
1913 CROUCH, 8-10 h.p., 3-sp., W.-C.	£68 5
1915 SAXON, 11 h.p., 2-seater	£120 0
1913 HUMBERETTE, 10 h.p., 2-seater	£68 10

SIDECARS.—Best makes stocked.

# LAMB

## MOTOR CYCLES FOR SALE.

## Peugeot.

PEUGEOT Twin, 4-5 h.p., in good working order; £14.—A. Allward, 28, Rhodes St., Barnsbury. [9257]

## Precision.

PRECISION, 4½ h.p., 2-speed, F.E., Millford sidecar, lamps, horn, etc.; £31.—1, Brackley St., E.C. [X0379]

PRECISION, 1914, 3½ h.p., 3-speed hub and clutch, all accessories, new condition; £32.—Montgomery, Victoria Rooms, Bristol. [X0844]

## Premier.

1911 Premier, Mabon clutch; £16.—86, High Rd., Lee, S.E. [9327]

3½ h.p. Premier; £16; any particulars given; a bargain.—Box L600, c/o The Motor Cycle. [9217]

PREMIER, 1913, 3-speed, and undershield Millford sidecar; £30.—29, St. Leonard's St., Bow, E. [9363]

FOR Sale, Premier, 1911, 3½ h.p., clutch model; £20, or offer.—Smith, c/o Junior Army and Navy Stores, Aldershot. [8935]

PREMIER Countershaft Combination, done 3,000, perfect; 42 gns.—Toward, Heathurst, Vale, Hampstead. [9524]

PREMIER, 1914, 3½ h.p., 3 speeds, Canoelet de Luxe sidecar; seen any time; £35.—Phillips, 8, Grand Parade, Harringay. [9407]

PREMIER, 1914½, 3½ h.p., 3 speeds, with sidecar, lamps, condition perfect; £50, or nearest offer.—Hughes, Hwynffynon, Huanbrynnair, Mont. [X0922]

PREMIER, 1914, 2½ h.p., 3-speed model, a little gem, nearly new; accept £30, or deferred payments.—Layton's Garage, Bicester, Oxon. [X0959]

PREMIER, 3½ h.p., 1913, 2-speed countershaft gear, complete with nearly new Millford torpedo wicker sidecar, lamp, horn; extraordinary bargain, £32/10.—Layton's Garage, Bicester, Oxon. [X0953]

LATE 1914 3½ h.p. 3-speed Countershaft Premier and sidecar, with seat for adult and child, good as new; £55, with accessories.—9, South Terrace, Hastings. [X0370]

PREMIER, 1912, 3 h.p., F.E., tyres good, new tube, lamp, horn, tools, good condition; 100 miles since last overhauled; £19.—P. T. Robinson, Trentham Rd., Longton, Staffs. [X0776]

PREMIER, 1915 (October), 3½ h.p., 3-speed, latest model, absolutely as new, not ridden 250 miles; owner buying lightweight; £56.—Rev. Gregory, 14, Melrose Terrace, Huddersfield. [X0725]

1914 Premier, 3½ h.p., countershaft gear box, clutch, chain-cum-belt drive, luxurious coachbuilt sidecar, trip speedometer, lamps, little used, new condition; £47; after 6.—77, Parliament Hill, Hampstead. [9526]

1914 Premier Lightweight, 2½ h.p., fixed engine, Bosch, just overhauled, splendid condition throughout, complete with lamps, horn; bargain, £19; offers.—Tylor, 224, High St., Berkhamstead. [X0915]

PREMIER, 1914, 3½ h.p., and sidecar, with hood and apron, 3-speed countershaft gear, free engine, clutch, and kick starter, speedometer, all accessories, condition perfect, tyres nearly new; £49/10.—Presth, 5, Cornwall Parade, Finchley. [9220]

## Quadrant.

3½ h.p. Quadrant, fitted with variable gear, sound 32 condition; £20; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X0884]

1915½ Quadrant Canoelet Combination, 3-speed, countershaft, chain drive, Lucas accessories, new; £65.—Letters, 206, High St., Tooting, S.W. [9291]

QUADRANTS.—New 1916 models from stock; all chain drive and chain-cum-belt models; cash, exchange, or easy terms.—Wauchope's, 9, Shoe Lane, London. [X0891]

QUADRANT, chain-cum-belt, 2 gears, 2-speed countershaft, F.E., kick starter, Simms, B.B., horn, lamps, tools, good tyres; seen any time; £17/10.—Pigott, 156, Ealing Rd., Wembley. [9381]

QUADRANT.—This excellent belt-cum-chain B.S.A. countershaft gear model actually in stock; £72/10; liberal deferred payments and exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9275]

QUADRANT, latest 1916 all-black models in stock; 4½ h.p., 3-speed B.S.A. countershaft gear, chain-cum-belt model, £60; 3-speed Sturmev-Archer gear model, £49/12/3; delivery from stock; exchanges or extended terms.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

QUADRANT 4½ h.p. 1915 Motor Cycle and Sidecar, 3-speed, and free engine, countershaft 3-speed gear, all chain drive, finished black and gold, fitted with Canoelet racing sidecar; price, including accessories, £55; guaranteed; includes Millers lamps, speedometer, hooter, and tools.—Wauchope's, 9, Shoe Lane, London. [X0894]

## Radco.

NEW Radco, 2½ h.p., 2-stroke, Palmer tyres; £25.—188, High Rd., Hford. [X0731]

RADCO, perfect condition, tyres unpunctured, all accessories; £22/10.—18, Bellevue Gardens, Clapham Rd., Stockwell, S.W. [9196]



## MOTOR CYCLES FOR SALE.

Rex.

**REX**, 3½ h.p., sidecar, 8-speed, new tyres; £25.—C/o Crouch End Motor Co., N. [19416]

**REX** 6 h.p., 2-speed 1913 Combination, in good order; any trial; £30.—29, Green St., Cambridge. [X0785]

**REX** 1912 Coach Combination, 5-6 h.p., mag.; any trial; £28/10.—1, Elmer St., Wandsworth. [X0931b]

**1908** 6 h.p. Twin Rex, mag. ignition, clutch, handle starting; cash offers wanted.—Pattison, Warren St., Hartlepool. [19234]

**75/-**, Bargain.—3½ h.p. Rex, overhauled, re-bushed, low, fast, good tyres, B. and E.—Particulars, Chappell, Queen's Rd., Nuneaton. [X0907]

**REX**, 4 h.p., 2 speeds, free engine, handle starting, Busch mag., and white ename sidecar, side entrance; £25.—271, Fulham Palace Rd., S.W. [19299]

**REX**, latest model, 6 h.p., with coachbuilt sidecar, never used, owner called on active service before delivery; £75, cost over 120 gns.; seen by appointment only.—Lewis, Fairlight Lodge, 121, Highbury New Park, London, N. [0768]

**REX**, 1914, bought new, 1915, 6 h.p., coach sidecar, 3-speed gear box, all chain, speedometer, fast, powerful, owner bought car; accept best offer over £40 for immediate sale.—Write, Rex, 13, Southwood Lawn Rd., Highgate, N. [19343]

**6 h.p.** Twin Rex Combination, motor cycle and sidecar, done about 5,000 miles, in perfect condition throughout, all accessories, 2-speed, with clutch, tyres all in good condition; £50, or near offer. Oakley, Ltd., 85, Regency St., London, S.W. [0755]

Rex-Jap.

**1914** 8 h.p. Rex-Jap and coachbuilt sidecar, not done 3,000 miles, all on; £48.—Wilkin, Hunter's Bar, Sheffield. [19446]

**1913** 8 h.p. Rex-Jap Combination, lamps, speedometer, spares; £48; bought car.—Peach, Uttoxeter [X0912]

Roc.

**4 h.p.** Roc, 2-speed, free, handle start, and Bristol coachbuilt sidecar, new 1½ belt, P. and H. head light, rear and sidecar lamps, horn, pump, tools, spare valve, tube, etc., Bosch, B. and B., butt-ended tubes, long, low, comfortable, smart turnout, ready for the road, bargain, £25 cash; no offers.—A. Williams, 13, York St., Bath. [19364]

Rover.

**1916** 3½ h.p. Rover Combination; £84/7; first cheque secured.—Wilkin, Hunter's Bar, Sheffield. [19447]

**CONSULT** Rex Mundy before purchasing a new or second-hand Rover.—See "Consulting Engineers" column. [19512]

**ROVER**, 1916 models in stock; immediate delivery T.T. models, with or without Philipson.—P. J. Evans, John Bright St., Birmingham. [19497]

**ROVER**, 1913½, 3½ h.p., 3-speed, clutch, lamps, complete, powerful, excellent condition; bargain, 31 gns.—32, Comeragh Rd., West Kensington. [19229]

**ROVER**, 1912, free engine, Philipson pulley, owner joined Flying Corps, must sell at once; genuine bargain, £23, or close offer.—162, Hagley Rd., Birmingham. [X0940]

**ROVER**, 1912, 3½ h.p., free engine clutch model, in exceptional order, new back tyre, enamel and plate like new, guaranteed sound order; bargain, £27/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0552]

Rudge.

**1913** Rudge and sidecar; 30 gns.—Julian, Winchester St., Basingstoke. [0776]

**1913** Rudge, T.T. model, perfect condition; £25/10.—Newham, 223, Hammersmith Rd., W. [19362]

**5-6 h.p.** 1913 Rudge Multi, lamp, horn, excellent order; £33.—C.B., 86, Walsworth Rd., Hitchin, Herts. [X0720]

**CONSULT** Rex Mundy before purchasing a new or second-hand Rudge.—See "Consulting Engineers" column. [19513]

**RUDGE** Multi, just arrived from works, 3½ h.p. roadster, £58/15.—D. J. Shepherd and Co., Enfield Highway. [19483]

**1915** Rudge Multi, clutch, and sidecar, perfect condition; £50; seen any time.—223, High Rd., Kilburn. [19468]

**1915** 3½ h.p. Free Engine Rudge, T.T. bars, perfect condition; £35.—Confectioners, 24a, Dartmouth Rd., Forest Hill. [19303]

**32 h.p.** Rudge Multi, 1914 model, free engine, complete with all accessories; £55.—Wauchope's, 9, Shoe Lane, London. [X0887]

**RUDGE**—If you want to buy a good one let us know. If you want to sell one let us know.—Lounman Bros., King St., Acton. 1578 Chiswick. [19481]

**32 h.p.** Rudge and wicker sidecar, 2-speed gear, numerous spares, splendid condition; £34, or nearest offer.—Box 9,997, c/o The Motor Cycle. [X0755]

**1913** Rudge Multi, 3½ h.p., free engine, handle-bar controlled, recently overhauled, perfect; £30.—Edwood, 100, Palegrave Rd., Scarborough. [19410]

**RUDGE**, 3½ h.p., 1913, T.T. model, Philipson pulley, excellent condition; £50, or near offer.—Berkett, c/o Pritchards, Bradford St., Bocking, Braintree. [19282]

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<b>RUDGE</b> , 1911, 3½ h.p., 2-speed, overhauled, and tank re-enamelled .....	£22 0
<b>ARIEL</b> , 3½ h.p., decompressor, semi-T.T. bars .....	£23 0
<b>TRIUMPH</b> , 3½ h.p., 1910, semi-T.T., with Philipson pulley .....	£22 10
<b>REX</b> , 5-6 h.p., 1910-11, 2 speeds, handle starting, and footboards .....	£22 10
<b>DOUGLAS</b> , 1914, 2-speed, Model V .....	£38 0
<b>BROUGH</b> , 1915, 3½ h.p., horizontal twin, 2-speed .....	£47 10
<b>A.J.S.</b> Combination, 1914, 6 h.p., 3 speeds, with hood and screen .....	£65 0
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<b>SCOTT</b> , 1914, 3½ h.p., 2-speed, with lamp, horn, and speedometer .....	£40 0

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## MOTOR CYCLES FOR SALE.

Rudge.

**RUDGE** Multi, I.O.M. T.T., August, 1915, done 1,200 miles, speedometer, and all accessories, very fast; £50.—Capt. Abell, 140, Harlaxton Rd., Grantham. [X0363]

**RUDGE**, 1913, free engine, good condition, re-bushed, tyres good, speedometer, and watch; owner going to Front; £24.—Toye, 47, Melrose Gardens, Hammer-smith, W. [19212]

**RUDGE**, T.T., 3½ h.p., 1915, in practically new condition, superb machine, picked engine, very fast; bargain, £37.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

**RUDGE** Multi, May, 1913, 3½ h.p., coach sidecar, upholstered real leather and springs, all tyres new, speedometer, perfect; £38.—Clark, 71, Park-holme Rd., Dalston, N.E. [19304]

Scott.

**1914** Scott and Myers coachbuilt sidecar, fine condition, lumps, horn, speedometer, Binks, all tyres and tubes good, spares; £43.—Knott, 25, Cross Oak Rd., Berkhamsted. [X0919]

**1914** Scott and Canoelet sidecar, not done 1,000 miles, scrupulously kept, condition like new, 650 tyres, lamp, horn, spares.—63, Wilton Rd., Spark-hill, Birmingham. [X0962]

**SCOTT** and Sidecar, 1914 combination, fitted with handsome coachbuilt sidecar, including speedometer and all accessories; £55, guaranteed.—Vauchope's, 9, Shoe Lane, London. [X0892]

**SCOTT**, 3½ h.p., 2 speeds, kick starter, 1915 B. and B. carburettor, automatic oiling, tyres and condition perfect, Milner lighting set, Stewart speedometer, safe, fast, and powerful machine, which will take heaviest sidecar; quick sale £25, lowest.—Lieut. Barringer, R.A.M.C., West Camp, Halton Park, Tring. [19398]

Sheffield Minor.

**SHEFFIELD** Minors.—Immediate delivery of this exceptionally fine 2½ h.p. 2-stroke single-speed, 28 gns.; 2-speed, 33 gns., including 1916 improvements.—Colmore Depot, 34, Colmore Row, Birmingham. [X2340]

Singer.

**SINGER**, 3½ h.p., T.T., 1912, speedometer, re-enameled; any trial; £23.—G. Bonham, 108, Broadway, Criklewood. [19319]

**SINGER**, 3½ h.p., semi T.T., very fast, all accessories, 1914, good condition; £23.—Waddell, Bileston, Ashford, Kent. [19208]

**LATE** 1913 Singer, 3½ h.p., clutch model, perfect condition; exchange higher power, any make.—40, High St., Aberlorn, Scotland. [X0765]

**3 h.p.** Singer, Bosch mag., Amac, h.b.c., spring 2 forks, perfect condition, ready to ride away; £14, or £11 and push bicycle.—6, Ruskin Rd., Crewe. [19473]

**SINGER**, 1913½, 4 h.p., countershaft, 2-speed, combination, Bramble sidecar, in excellent condition; lamp, generator, spares, etc.; £43.—Proctor, 110, Grosvenor Rd., Rugby. [X0944]

Sun.

**SUN-VILLIERS**, 1915, not used, owner nervous, 2-stroke; £18.—130, High St., Croydon. [19376]

**SUN** 2-stroke.—All models from £30/10 to £37; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [19594]

Sunbeam.

**SUNBEAM**, 1916.—New 3½ h.p. combination and T.T. models in stock.—Moss, Wem. [X0826]

**CONSULT** Rex Mundy before purchasing a new or second-hand Sunbeam.—See "Consulting Engineers" column. [19514]

**SUNBEAM**, 1916, 8 h.p. M.A.G., just arrived; £89/5; exchanges entertained.—Deane, Matlock Bath, Derbyshire. [X0845]

**SUNBEAM**, 1914, 3½ h.p., 3-speed, lamps, Cowey, Mountgomery sidecar, perfect condition; 60 gns.—Rich, Victoria Rd., Horley. [19414]

**1915** 3½ h.p. Brand New Sunbeam in stock, with latest improvements.—Recognised Sunbeam agents, Robinson's Garage, Green St., Cambridge. Telegrams: Bicycles. Telephone: 388. [19685]

**6 h.p.** Sunbeam Motor Cycle and Gloria Sidecar Combination, luxuriously fitted up, excellent condition throughout, only run 2,150 miles; will accept £90, or nearest reasonable offer for quick sale.—J. Knowles Hassall, Moira Rd., Woodville, near Burton-on-Trent. [19488]

**LATE** 1915 Sunbeam 3½ h.p. Combination, only used fine holidays, under 2,500, Stewart speedometer Lucas horn, electric rear light, many spares, including two inner tubes, new Palmer tyre, sidecar wheel, fully insured till May, perfect condition; now at Sunbeam land, exchanging before sale; owner enlisted; £75.—W. N. Thomas, King Edward School, Sheffield. [X0798]

Swift.

**32 h.p.** Swift, good, sound machine, running splendid; £20; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X0888]

**32 h.p.** Swift, 1914½, and coach-built sidecar, 3 speeds, 32 countershaft, clutch, lamps, horn, etc., splen did running order, just overhauled; cost £78, sell £45.—Capt. Mackenzie, War Hospital, Reading. [X0761]

## MOTOR CYCLES FOR SALE.

T.D.C.

DE LUXE T.D.C., in stock, immediate delivery; £22.  
—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [8682]

## Triumph.

1913 T.T. Roadster 3-speed Triumph; £32.—86, High Rd., Lee, S.E. [9326]

1915 Junior Triumph, good as new; £38.—Parker and Son, St. Ives, Huuts. [9464]

4 h.p. 1914 Triumph, 3-speed model; £40; guaranteed.  
—Wauchope's, 9, Shoe Lane, London. [X0886]

TRIUMPH, 1911, lamps, spares, grand condition; £18.—11, Luna Rd., Thornton Heath. [9369]

1912 3½ h.p. Triumph, free engine, lamps, etc., complete; £35.—F. W. Giles, Durdham Park, Bristol. [9138]

TRIUMPH, 3½ h.p., 1913, 3-speed, sidecar, excellent condition.—Holmes, Glendinning, Weymouth. [9251]

TRIUMPH, 1913, 3½ h.p., 3 speeds, in splendid condition; £35.—Earl, 5, Heath St., Hampstead. [X0928]

TRIUMPH, 1916, 4 h.p., countershaft model; in stock.—Priestley, Seamount Rd., Bournemouth. [9397]

TRIUMPH, T.T., 1911, absolutely perfect; £22.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [8677]

3½ h.p. Triumph Roadster, semi T.T., absolutely perfect; offers.—275, Bramstone Rd., Burton-on-Trent. [9250]

TRIUMPH, 3½ h.p., T.T. and sidecar, splendid condition; £30.—A. Roberts, Freeland Rd., Cobham, Surrey. [9196]

TRIUMPH, late 1914, 3-speed, perfect order throughout; £32.—Speechley, 45, Church Rd., Acton. [X0987]

CONSULT Rex Mundy before purchasing a new or second-hand Triumph.—See "Consulting Engineers" column. [9515]

1911 Free Engine Triumph, perfect, 3½ h.p.; offers wanted, reasonable.—Woodall's, Cycles, Scarborough. [X0769]

3½ h.p. Triumph (late 1911), free engine, splendid mount, little used.—18, Burwood Mews, Edgware Rd., W. [9419]

3½ h.p. Triumph, in perfect condition, free engine, just overhauled; bargain, £18.—Castle Garage, Salisbury. [X0041]

TRIUMPH, 1908, perfect condition; £19/10; anything useful part exchange.—Armstrong, 350, Easter Rd., Leith. [X0838]

BROOK, Motor Cycle Specialist, Burnham, Som., has a few 4 h.p. 3-speed Triumphs for sale. Write today for list. [8578]

1915 Junior Triumph, splendid condition, Lucas head lamp and horn; £34.—J. W. Kinsey, Middlewich. [9281]

TRIUMPH Junior, March, 1915, as new, only used week-ends; £35, no offers.—School Lodge, Plassy Rd., Catford. [9255]

TRIUMPH, 1914½, 4 h.p., 3-speed, lamps, usual spares, Canoelet sidecar; £49/10.—Macer, 20, Woodgrange Rd., Forest Gate. [X0852]

1910 Triumph, fixed engine, really good machine, just overhauled; £15.—Robinson's Garage, Green St., Cambridge. [6866]

TRIUMPH, 1911, 3½ h.p., adjustable tappets, F.E., T.T. bars, tyres, belt as new; £20.—The Croft, Middleton Rd., Oldham. [X0840]

1914 4 h.p. 3-speed Triumph and coachbuilt Gloria sidecar, lamps, horn, and all tools; £52.—Wilkin, Inster's Bar, Sheffield. [9444]

TRIUMPH, 1913, 3½ h.p., 3-speed and clutch, all accessories, new condition; £32.—Montgomery, Victoria Rooms, Bristol. [X0843]

TRIUMPH, 3½ h.p., Roo 2 speeds, clutch, overhauled, B.S.A. carburettor, good condition; £22.—Sheriff, Cranleigh, near Guildford. [9184]

1913 3½ h.p. Triumph, 3-speed, with Millford wicker sidecar, perfect condition; £45.—Morley, Summer Lane, Wombwell. [X0904]

1912 2-speed Free Engine Triumph, coachbuilt cane sidecar, and all accessories; £28, perfect; £31, 45, Bow Common Lane, E. [9436]

TRIUMPH, 1910, new back tyre and belt, just overhauled, first-class running order; £18.—Hesford, 52, Widemarshe St., Hereford. [X0858]

1913 Triumph, fixed engine, semi-T.T. bars, excellent condition, good tyres; £27.—Robinson's Garage, Green St., Cambridge. [6867]

TRIUMPH, 4 h.p., new, only ridden 6 times; given up on account of joining up; for £30.—Mr. T. Mahone, 15, Longbridge Rd., Barking. [9206]

TRIUMPH, 1910, 3½ h.p., good condition, Bosch mag., tools, spares, etc.; particulars on application; £18, or offer.—Smith, 45, Mill St., Penrith. [X0755]

TRIUMPH, early 1914, clutch, Mabon gear, speedometer, cane sidecar, perfect condition; £35.—10, Bloomfield House, King St., Snow Hill. [9317]

TRIUMPH 3½ h.p. and Sidecar, in good running order; £25, or nearest offer; owner going to France.—Smallwood, 317, Rotherhithe, New Rd., S.E. [9301]

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ENFIELD, 6h.p., 1913, coachbuilt Sidecar Combination, perfect condition	£52 10
DOUGLAS, 1914, T.T., Model V, 2-sp., excellent condition, with accessories	£36 10
NEW HUDSON, 4 h.p., 1913 model, with 3-speed gear, kick starter, accessories	£32 10
N.S.U., 3½ h.p., model de luxe, 1913, loop frame, rear springing, 2-speed, free engine	£26 10
HUMBER, 3½ h.p., 1912, Mabon h.c. clutch, excellent condition	£19 0
CALTHORPE, 1915, 2½ h.p., 3-stroke model, 2-speed gear, variable mag. control, only used 250 miles, as new	£28 10
DOUGLAS, 2½ h.p., late 1914, Model U, 2-speed gear, new condition, with accessories	£39 0
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## MOTOR CYCLES FOR SALE.

## Triumph.

TRIUMPH, 4h.p., 1914½, 3-speed, condition and tyres as new, Lucas lamps, generator, speedometer, etc.; £47/10.—Fordick, Halliwell, Minster, Ramsgate. [8625]

1913 3½ h.p. 3-speed Triumph, with Canoelet coachbuilt sidecar; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0734]

4 h.p. Triumph, 1915, 3-speed hub, kick start, semi T.T. bars, Bramble sidecar, in splendid condition; what offers.—Clough, 16, Brighton St., Stoke, Coventry. [X0792]

TRIUMPH, new cylinder, piston, valves in September, B. and B. variable jet, D2A mag., nearly new tyres and belt; £20.—C. W. Croxon, Burnham, Essex. [1928]

TRIUMPH, 1911, 3½ h.p., N.S.U. 2-speed, adjustable pulley, new heavy Kempshall, engine excellent condition, fast machine; £34.—Adams, 19, Edgware Rd., W. [9440]

1914 Triumph, late, 3-speed, all accessories, engine perfect; any examination; appearance as new; evenings after 6.30; £46.—Ball, 15, Acol Rd., Fulham, S.W. [9329]

TRIUMPH, free engine, 3½ h.p., 1909, completely overhauled, re-bushed, and new tyre fitted, splendid condition; nearest £20.—B. S. Seymour, Castle St., Rugby. [X0794]

TRIUMPH, 1912½, F.E., Philipson pulley, good tyres, belt, lamps, horn, good order; £30; 1915 light C.B. sidecar, £5.—Douglas, The Cottage, Cleodan, near Sunderland. [9248]

TRIUMPH, new 1914, free engine, decompressor, new 13 gn. coachbuilt sidecar, lovely combination, complete accessories; £47.—Mills, 219, Stoney Stanton Rd., Coventry. [X0983]

TRIUMPH, 3½ h.p., 3-speed, April, 1914, under 2,500, Jones speedometer, lamp, horn, perfect order; £39; good make 2-stroke taken up to £20.—O'Hanlon, Templemore, Tipperary. [X0618]

LATE 1913 Triumph, Sturmer 3-speed gear, and coachbuilt sidecar, speedometer, and 2 Lucas lamps, all in first-class condition; £42/10.—Tilley, The Esplanade, Weymouth. [X0991]

TRIUMPH, late 1914, 4 h.p., 3-speed, and magnificent Gloria coachbuilt sidecar and accessories, perfect condition, like new; £57, bargain.—7, Church Green West, Redditch. [X0913]

1913 3-speed Triumph, with brand new 17 gn. Gloria sidecar, luggage rail, all accessories, perfect; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0720]

TRIUMPH, 1914 (late), model C, 3 speeds and clutch, speedometer, lamps and horn, cane underslung sidecar, splendid outfit; £56.—Elee and Co., 15-16, Bishops-gate Av., Camomile St., E.C. [0599]

TRIUMPH, 1913½, 3-speed, done 4,000, sidecar, fine condition, plating and enamel good; examination invited, evenings or week-end; spares; £40, new.—W. Jackson, Ahrewas, Burton-on-Trent. [X0796]

1914½ Triumph, 4 h.p., free engine, 3-speed, good condition, brand new Dunlop on back, not used, complete with No. 7 wicker Montgomery sidecar; bargain, £52.—148, Hills Rd., Cambridge. [X0679]

TRIUMPH, 1912, F.E., Philipson variable gear, Bowden mag. control, lamps, horn, tools, tyre, good, spare belt (new), spare tube, engine overhauled October; £26.—12, Bursley Rd., Kentish Town. [9312]

1910 Clutch Triumph, with electric head and tail lamps, with accumulator, horn, belt and tyres almost new, engine perfect; any reasonable trial; £22.—Harvey, Hudson and Co., South Woodford. [X0847]

TRIUMPH, 4 h.p., 3-speed, new June, 1915, done 900 miles, condition throughout as new, lamp, horn, knee grips, rear light, complete tools, and all spares; £50.—Box L622, c/o The Motor Cycle. [9499]

TRIUMPHS, 1914 3-speed combination 60 gns., 1913 241/10, 1910-1 £20; all complete with accessories; deferred payments if desired.—Lamb, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9269]

TRIUMPH, 1914½, 4 h.p., 3-speed Sturmer-Archer, with coachbuilt sidecar, Stewart speedometer, all accessories, tyres as new, splendid condition; £50, bargain.—Walley, Aspley Grove, Standford, Wolverhampton. [X0681]

TRIUMPH, 1911, clutch model, 3½ h.p., 1915 N.S.U. gear, long exhaust pipe, electric head and rear lamps, new Dunlop on back, Cowey speedometer, horn, and tools, etc., excellent condition; £30.—Preston, Therfield, Herts. [9191]

1912 Triumph Motor Cycle, single-speed, free engine, clutch, heavy Dunlop tyres (only 2 months' wear), Klaxon horn (21/-), lamp, generator, spares, tools, etc., complete, whole machine sound throughout and in perfect running order; £22 cash.—Box 5, c/o The Motor Cycle. [X1002]

1913 3½ h.p. 3-speed Triumph and new coachbuilt sidecar, engine recently overhauled by Triumph, as new, tyres good, spare belt, Millar head light, electric rear, all tools and spares; £45, or exchange twin countershaft, Bat or Zenith.—Write, Lieut. Sturton, Carlton, Blesheim Gardens, Cricklewood. [X0823]

## Tyler.

2-STROKE Tyler, 2½ h.p., not done 600 miles, delivered May, 1915; £24.—Tebbit, 85, Ouslow Rd., Richmond. [X0730]

## MOTOR CYCLES FOR SALE.

## Tyler.

**TYLER**, 2-strokes.—All models from £29 to £42; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [X9239]

## Westovian.

**WESTOVIAN**.—All models from £35 to £70; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [X9590]

## Williamson.

**1914 Williamson** Special Combination, many refinements; £70; exchange.—Williams, Moncrieff Lane, Glasgow. [X0783]

**WILLIAMSON** and Coachbuilt Sidecar, 1914, water-cooled, 2-speed, clutch, lamp, generator, mechanical horn, new Palmer tyres all round, very little used, lovely job; £55.—Moore, Motors, Andover. [X9309]

## Zedel.

**ZEDEL**, 2½ h.p., mag., good tyres, runs well; £8/15.—1, Ebner St., Wandsworth. [X0931a]

## Zenith.

**1915 Zenith** Gradua, 3½ h.p., does 50 m.p.h.—39, Belmont Park Rd., Leyton. [X9504]

**CONSULT** Rex Mundy before purchasing a new or second-hand Zenith.—See "Consulting Engineers" column. [X9517]

**3½ h.p. Zenith**, late model, and 20 g.n. sidecar, tools, 32 lamps, spares; £45.—149, London Rd., West Croydon. [X9289]

**ZENITH**.—1916 models at P. J. Evans, Birmingham Depot, immediate delivery all models, 87-91, John Bright St. [X9498]

**ZENITH-GRADUA** Combination, 8 h.p., new tyres front and back; £47; any trial any time.—16, Longmead Rd., Tooting, S.W. [X9321]

**ZENITH** 4 h.p. Twin, Gradua gear, not run 200 miles, with accessories; just cost £63, sell £52.—Tilley, The Esplanade, Weymouth. [X0993]

**ZENITH 1914** Twin, new condition, 6 h.p., Millford sidecar, speedometer, horn, lamps, etc.; £55; no exchange.—Edis, 178, Garratt Lane, Earlsfield. [X9236]

**8 h.p. Zenith-Gradua**, 1915½, with F.R.S. lamp, speedometer, and Lucas horn, and Bramble sidecar; 1,500 miles; £72.—To be seen at Stretton's Garage, Gloucester. [X0835]

**ZENITH** Twin, 6 h.p., 1913, splendid condition, with new Bramble coachbuilt sidecar; cost £12, cheap, £48, with lamp, etc.—Smith, Grocer, Somersham. [X0715]

**1914 8 h.p. Zenith**, clutch model, kick starter, splendid order; any trial given, distance no object; large Lucas lamp and horn, electric rear light, good tyres and belt; approval on "The Motor Cycle" deposit system; best offer over £45.—29, Green St., Cambridge. [X0784]

**ZENITHS**, new 1916 models, for immediate delivery from stock; 6 h.p. models, countershaft gear, and free engine and kick start, £84/6/3; 4-5 h.p. twins, popular solo mounts, kick start, free engine, countershaft gear, £75/18; guaranteed.—Wanchope's, 9, Shoe Lane, Fleet St., London. [X0898]

## Ladies' Machines.

**CONSULT** Rex Mundy before purchasing a new or second-hand ladies' machines.—See "Consulting Engineers" column. [X9518]

**SINGER**, lady's model, 2½ h.p., free engine, speedometer, new tyres and belt, perfect running order; £30.—Barford, Brinton, Somerset. [X9245]

**LADY'S** Lewis, 2-stroke, free engine and kick start model, 1914 machine, in nice condition; £22/10; guaranteed.—Wanchope's, 9, Shoe Lane, London. [X0895]

**NEW** Imperial, lady's, 2-speed, kick start, handle-bar clutch; first cheque secures one of these splendid lady's mounts; 43 gns.—Local Agents, Embro Cycle and Motor Co., Charlotte St., Hull. [X9242]

**LADY'S** Douglas, 1913-14, 2-speed, clutch, kick starter, lamps, horn, spares, Wilkinson carburettor, giving great range of speeds, very little used, exceptionally fine engine, selected for lady trials rider, great on hills; any trial; price £40.—S., 41, Ash Rd., Stratford, E. [X9300]

## Miscellaneous.

**1916 Big Four** Combination, chain drive and T.T. models in stock.—Wilkin, Hunter's Bar, Sheffield. [X9450]

**If You Want Bargains** in second-hand motor cycles you can get them at Wanchope's, 9, Shoe Lane, Fleet St., London. [X6624]

**SMART** Combination, 1914, 3½ h.p., 3-speed, cane sidecar, well upholstered, lamp, horn, Samspray; 38 gns.—Railway Garage, Staines. [X9482]

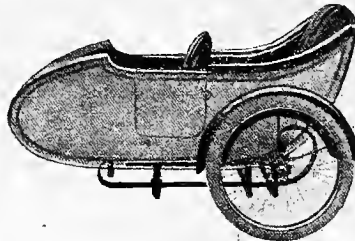
**LONGMAN** Bros., King St., Acton. 'Phone: 1578 Chiswick.—Before purchasing a machine, advise and let us quote. We don't think that we can save you money; we know it. [X9480]

**1915 A.J.S.** Twin and sidecar, good as new, complete, £75; 3-speed Triumph and sidecar, complete, £40; 1913 3½ h.p. Premier, 2-speed gear, cane sidecar, £35; 1913 Rex Sidette, £40; wanted, Morgan runabout, sale or exchange.—7, George St., Stroud. [X9237]

# G.K.

## SIDECARS

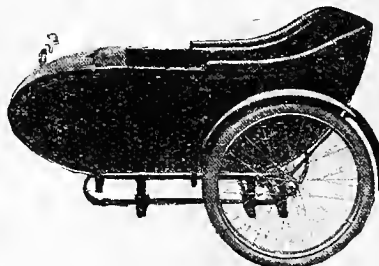
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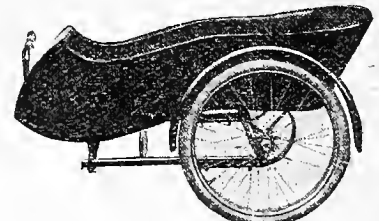
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## MOTOR CYCLES FOR SALE.

## Miscellaneous.

**HEBDEN'S** have in stock now, no waiting:

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**1915 7-9 h.p. Harley-Davidson**, 3-speed; £78, accept £70.

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**1915 2½-3 h.p. Wolf**, 2-stroke, 2-speed; £33/10, accept £28.

**1915 2½ h.p. Wolf**, 2-stroke Peco engine, 2-speed; £35/16/6, accept £30/10.

**THE** above are brand new, clean, and not shop-soiled.

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**1915 Williamson** Combination, 8 h.p., water-cooled; cost nearly £110, accept £80.

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**4 h.p. T.T. Bradbury**, as good as the best; only £22.

**2½ h.p. Douglas**, 2-speed, clutch, and kick starter, in 4 really tip-top order; a rare bargain, £35.

**THE** Above are all really good and genuine bargains, fitted up complete with kumps, horns, etc., ready for the road.

**BRAND** New Williamson (Douglas) Cycle Car, 8 h.p. Douglas engine and gears, the smartest 3-wheeler turned out; £120, fitted up complete.—Call, 'phone, or write, Hebdens's Motor Mart, St. James's St., Bury. Tel.: 488. [X9427]

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**PALMER'S** Garage, Tooting.—2½ h.p. Enfield lightweight, 2-cyl., all chain drive, pedal starter; £18.

**PALMER'S** Garage, Tooting.—2½ h.p. Torpedo-Pre cisica lighting touring model, nice order; £14/10.

**PALMER'S** Garage, Tooting.—7-9 h.p. 1914 Quadrant and sidecar, 2 speeds, handle start; £40.

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**PALMER'S** Garage, Tooting.—7-9 h.p. Indian T.T. model, as new, fitted disc wheels; £47/10.

**PALMER'S** Garage, Tooting.—3½ h.p. Humber and sidecar, 2 speeds, F.E., £18; also 2 h.p. Humber lightweight, £12/10.

**PALMER'S** Garage, Tooting.—Next Auction Sale 16th February, at 2 o'clock. Catalogues free. Entries invited.—Sole address, Palmer's Garage and Motor Auction Rooms, 183, 185, 187, 189, High St., Tooting. 'Buses, trams pass doors. Railway stations: Wimbledon (L. and S.W. Rly.), only 20 minutes; Victoria, via Balham (L.B. and S.C. Rly.). [X937]

**O.K.** Junior, 2-speed, 1915, as new, £25; 90° Jai Chater and Rudge sidecar, £50; 5-6 h.p. Martin brand new, £35; 5-6 h.p. twin, latest frame, re-amalgamated, £18; 2½ h.p. Kerry, £6; any exchanges. Call 'phone 93 Sydenham.—65a, Rosendale Rd., West Dulwich. [X0993]

**BARGAINS:** 30 shop-soiled motor cycles at 20% of list prices.—We have had placed in our hands for immediate disposal 30 motor cycles from 2 to 8 h.p. all by well-known makers; a few at even less price which have been used as demonstration machines.—Oracle Motor Cycle Co., 336, Gray's Inn Rd., W.C. [X913]

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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Telegrams: "Cyclist, Fleet, London."  
Telephone: 2845 City (five lines).

## Editorial Offices:

Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
Telephone: 10 Coventry (five lines).

## Northern Offices:

199, Deansgate, Manchester.

Telegrams: "Hifle, Manchester."  
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Subscription Rates: Home, 8s. 8d.; Canada, 10s. 10d.; Foreign, 15s. 0d. per annum.

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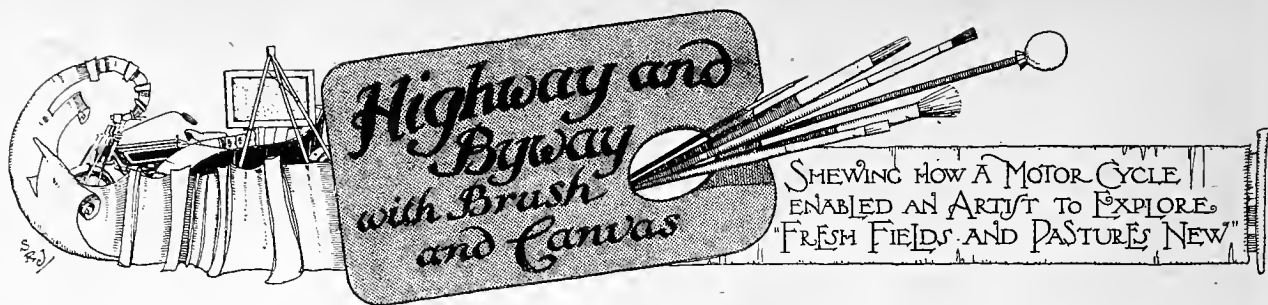
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## The Value of Experience.

**J**UST over a year ago we mentioned on this page that the War Office were permitting manufacturers of Government motor lorries to visit the field of operations in order to study the actual conditions under which their vehicles were being used. At that time we took it for granted that the same privileges would be extended to motor cycle manufacturers, and we expressed our satisfaction at the new move, which, to our mind, was destined to prove of great benefit to the country in general. Subsequently, however, it transpired that motor cycle manufacturers had not been invited to visit the war zone, useful though the educational value of a visit would have proved in respect of the elimination of weak points and in desirable modifications on future supplies. It may be recalled that at the end of last summer, when we were embarking upon the second winter campaign, *The Motor Cycle* drew attention to the fact that machines of standard design were still being supplied to the War Office, though it was common knowledge that they possessed a number of unsuitable features which had been brought to light by the extremely adverse conditions existing in France and Flanders. The fact that they were of a minor order, and comparatively easily eradicated, served only to aggravate the position. We expressed astonishment that the faults had not been eliminated long ago, since it had been demonstrated beyond doubt during the previous winter that the items in question were inadequate and not up to their work. We refer to weak forks and fork links, inadequate mudguarding, unsuitably designed touring handle-bars, hubs which were not entirely weatherproof, and so on. Two very obvious courses were open for the eradication of those weaknesses, viz., either an authoritative report by practical motor cycle engineers at the Front, or a thorough insight into the conditions under which the machines were used by representatives of the producers.

Since that time the second course named has been adopted, and in this issue we publish impressions by manufacturers' representatives who have been privileged to visit the various base camps and consult officers at repair bases as to the most prevalent causes of trouble, and the desirability of modifications in design. The four firms regularly supplying motor cycles to the Government, viz., Triumph, Douglas, Clyno, and Phelon and Moore, have within the last three months paid visits to the war zone, and we predict that this belated move will produce results of general benefit to the country, not to mention the convenience and safety of the motor cyclists using the machines. We may also venture to recommend that further systematic visits should be allowed and even encouraged. Already we have dwelt upon the fact that certain parts, even on comparatively new machines, have in the past been constantly scrapped on arrival in France on account of their proved unsuitability, which is not only a waste of money but a waste of time on the part of mechanics in effecting the necessary changes, particularly when it is remembered that these unsuitable points of design might well have been rendered non-existent at the fountain head, i.e., at the works. A further development of manufacturers' visits to the war theatre may eventually be the adoption of real lightweight machines for winter conditions. We are still firmly of the opinion that the handy and stable lightweight solo mount would prove advantageous to despatch riders during the winter months, when it is usual for the roads to be several inches deep in mud. Pace during this period is not wanted, and is, indeed, impossible, and, judging from all accounts, falls far more frequent in the case of heavy machines than they need be. We have good grounds for stating that the Government are none too favourably disposed towards two-stroke engines at present, which is unfortunate, as this fact provides a natural bar to the adoption of lightweight motor cycles.





PAINTERS of landscapes and country scenes are usually regarded as sedentary individuals, probably because they are not generally recognised as artists except when they are seen in reposeful attitudes with brush and canvas. But, as a matter of fact, there are few free-lance professions in which it is so vitally necessary to keep on the move, and to make oneself thoroughly acquainted with the country one has chosen to work upon. As a rule, the artist who remains near home in time becomes stale, and sooner or later he experiences difficulty in finding new subjects or new inspirations. The old scenes lose much of their interest, and work acquires a sameness that is sorrowful to contemplate.

The natural impulse when this occurs is to get right away and try something new—a step one should have taken long ago—but when the actual pinch of necessity comes, the way is not always so easy as it might have been earlier.

Realising all this two years ago, I decided to fling the slender sum of my worldly possessions into the purchase of a motor cycle and sidecar outfit. It was a desperate move, and meant risking the anger of a kindly old aunt; but the case demanded desperate measures of some sort, if only to save the beloved old aunt from the bankruptcy court and myself from the sticky profession of bill-posting. So in due course the speculation was made, and, having survived the initial shock of purchase, things began to prosper.

To-day I regard my sidecar outfit as a necessary part of my professional impedimenta, and am often led to wonder how artists who are compelled to remain amidst surroundings that are not entirely congenial manage to root up sufficient material to keep themselves fully employed. During my jaunts over the moors and through the valleys, from one scene of activity to another, I am constantly stumbling across views or incidents that suggest my next picture, and can safely say that the incessant struggle for new ideas ceased when I joined the cosmopolitan brotherhood of motor cyclists.

Before this happy event took place I imagined myself to be thoroughly familiar with the country in which I was then living, a region of hills and hollows and unexpected little flowery nooks. But before I

had possessed the machine a fortnight I began to realise my mistake. I discovered two villages within five miles of home that I had never seen before. One of these was a ruined and deserted little hamlet, overgrown with great beds of nettles and disorderly elderberry bushes. The roses which had once adorned the gardens had become wild, and hung in festooned masses about the walls. Starlings whistled shrilly from the shattered window sills, and about the whole place was an atmosphere of peace and abandonment.

It was while cautiously wending my way home along a narrow, overgrown lane, that no one seemed to use, that I discovered this former abode of habitation. A water-splash had to be negotiated on the way, as the autumn floods had swept away the bridge. Next day I came again with a tent and full camping outfit, and made camp in the midst of the abandonment. I found that most of the neighbouring villagers knew of the place, but that few of them had visited it. For a week I had



A deserted Village

the spot to myself, and finally produced a picture which was a great factor in the building up of what little success I have since enjoyed.

A score of times since then my motor cycle has been instrumental in the similar discovery of scenic gems, and in summer time it is a joy to possess. So much of one's success in this line of business depends upon keeping one's mind fresh with various scenes at various seasons. It is a great help to one's productive powers to be able to visit distant and varied scenery, and a motor cycle affords a cheap and excellent way of doing this effectively. Running expenses and depreciation are nothing to the comparative value of being able to get from one valley to another, or even from England to Scotland, quickly and easily.

Then there are periods when one becomes worked out, and when it is just as well to drop business for a time. When this happens I usually pack a few belongings into the sidecar, and go off for a random tour with camera aboard. Of course one is compelled to take brushes and canvas, for these things become part of one's anatomy, but it is best to forget that they are there, and to devote oneself strictly to the camera. The photographic results are of value in

**Highway and Byway with Brush and Canvas.**

that they sometimes provide food for reflection during seasons when outdoor painting is impossible.

**The Search for Subjects.**

The choicest scenes are seldom found by the broad highways. One has to leave the beaten tracks and haunt the seldom frequented lanes—over the mountain passes, through narrow woodland byways, across stretches of moorland, where the wheel tracks have become the beds of tiny brooks, and where steep ascents are the order of the way. The subjects that make the strongest appeal (to me, at any rate) are usually found in the most unexpected places—an abandoned limekiln in the midst of the heather, a decayed and tumbling bridge miles away from anywhere. A glimpse through the trees or between the hills, and one jams on brakes and turns back, vaguely fearful that the scene may suddenly transport itself to another portion of the globe.

All one's outfit has, of course, to be carried in the sidecar—how one recalls the sweltering summer days when one carried it shoulder high from place to place!—and therefore a powerful machine and one of really good design is necessary. One must be prepared to go anywhere, and my experience is that rough riding does a machine very little harm. My present mount is only  $3\frac{1}{2}$  h.p., but it has never failed me, though very few artists—they are much the same temperament in this respect—would trouble to keep their engine in proper tune. A chain-driven twin is probably the right thing for the work, but most twin sidecar outfits are so heavy that I prefer my own single and featherweight sidecar. The jolting strain on a really heavy machine when negotiating rocky mountain roads must be out of all proportion to the strength of construction, founding one's comparison on the construction of a well-made single; at any rate, I have negotiated mountain tracks on which a heavy twin failed utterly from back wheel slip.

**The Convenient Sidecar.**

But this is probably a matter of taste, and, given a good sidecar machine of any type, one is not likely to fail to accomplish any reasonable feat. To stick on a bad hill when one has all one's kit aboard is, to say the least, annoying, and, further, it is extremely dangerous to sit still in an exposed position when one has become overheated beforehand. It is vastly important, both for one's work and one's health, to arrive on the scene of work in a cool and comfortable condition. Personally, I always carry a length of rope in the sidecar for roping the back wheel, and this often saves the situation when greasy ascents are to be made.

The sidecar comes in useful as a seat from which to work, as it is more comfortable and far more sheltered than a stool. An artist's folding stool shelters

one from the wind about as much as a small boy's bathing costume would shelter a fat policeman from the waters of the Yukon in mid-winter. When one has to sit for hours in a draughty little valley on an autumn day, a comfortable sidecar is much more to the point. I use my sidecar whenever it can be conveyed to the scene of action, and it is surprising where one can get a motor cycle when one really tries.

Summing up, I am convinced that when I purchased my machine I made the best investment it has ever been my good fortune to run up against. Probably success would duly have arrived had I followed other lines, but it is very clear that without the machine I could never have had so many strings to my bow as I have to-day. Solely on account of the ease with which I can get about, I recently procured a standing order for an annual series of pictures for calendar production. This commission took me to Holland two years ago, where I motored from one agricultural centre to another, and would have taken me to Belgium last year had not events taken an unhappy turn. When touring in Scotland, however, I happened to see some shepherds at work with a new process which suggested a substitute for the Belgian series, and so I succeeded in holding down the commission—thanks again to the motor cycle.

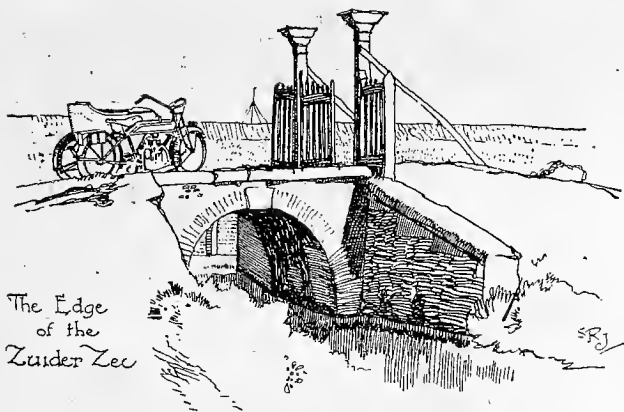
**The Salmon Poachers.**

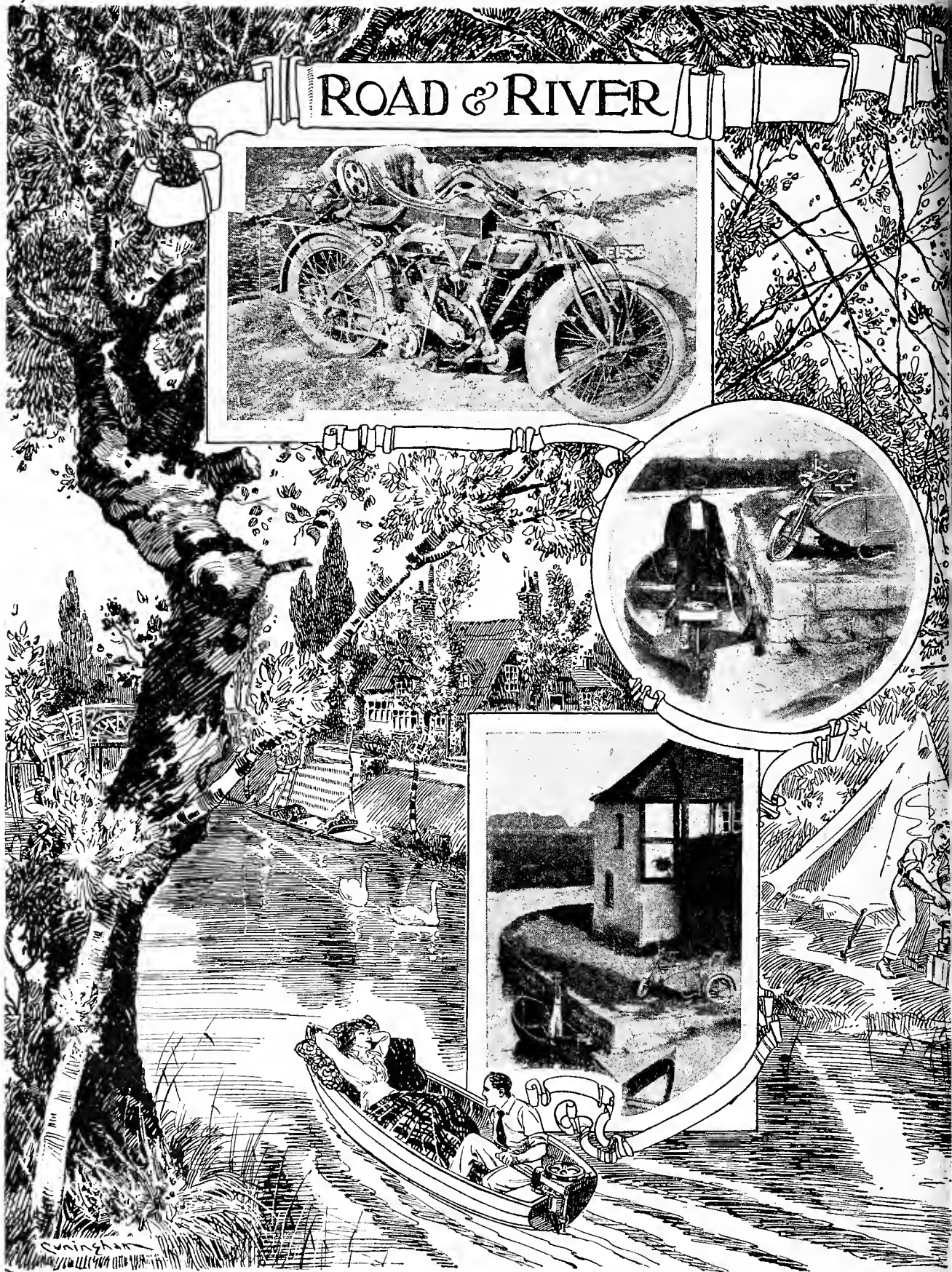
While wandering about the country I have picked up a hoard of information on various subjects, most of which will come in useful sooner or later. On one occasion I stumbled across a gang of salmon poachers at work on the Tweed, and forthwith produced a picture that sold at once to a sporting landowner of the vicinity. This gave

me the hint that it was worth while remaining in the district and making a series of salmon angling pictures. It cost a bottle of whisky a day for the gillie, but he deserved it, since he was often called upon to stand thigh deep in the chilly Tweed for long periods at a stretch in order to give me the correct attitudes. I knew that I could get my own price for really good work, and in the end the sporting landowner and I parted on the best of terms. He even gave me another commission.

And so, since I became a motor cyclist, I have established business connections and acquaintances all up and down the country, and consequently need never be short of work. The kindly old aunt no longer dwells beneath the shadow of the bankruptcy court, and has even acquired a quizzical interest in that diabolical invention on which I shin up and down this flower-strewn island. At any rate, she made no complaint when I razed a whole row of geraniums while giving an exhibition ride for her benefit round the back garden. Possibly this was because her interests were centred on the cat, which was racing within a yard of the front wheel throughout the whole of the performance.

H.M.B.







## Combining the Pleasures of Motor Cycling and Boating.

THE motor cyclist whose home is situated within easy reach of a river or lake suitable for boating is much to be envied, and those who have once experienced the pleasures to be obtained from such enviable environment, and have, for some reason or other, been compelled to change their place of residence to some part far removed from a good stretch of water, must feel an almost irresistible longing, during their leisure hours, for the opportunity to indulge in their former pastime.

To the boating enthusiast, the call of the river is as strong as is the call of the road to the enthusiastic motorist, and nothing else can fill the void created by the absence of facilities by which to satisfy it. In these days the motor cycle has been largely used by many keen boating men and women to enable them to enjoy their favourite pastime, and it would be almost impossible to find a spot in these islands in which a good piece of water could not be reached in quick time by means of a motor bicycle or sidecar outfit.

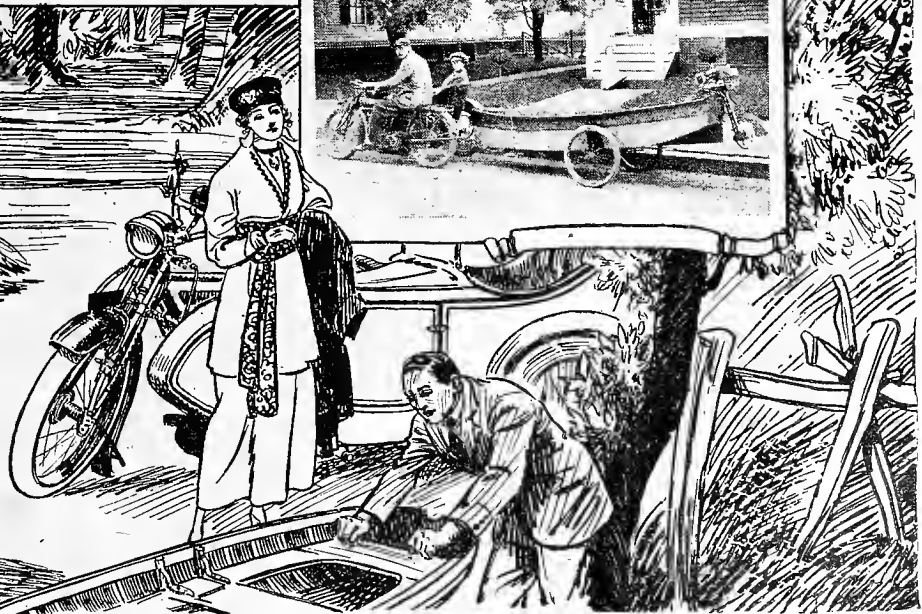
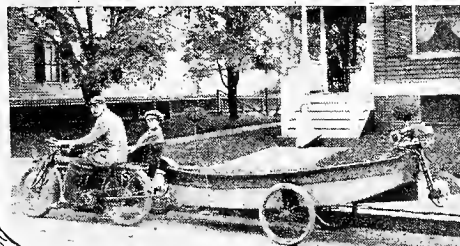
Many river men are fond of taking their pleasures in a motor launch or boat, but the cost of maintaining and housing a motor boat at some distance from their place of residence often causes them to give up the idea. One way out of the difficulty, however, is to purchase a portable boat-propelling motor, such as the Evinrude, the Motogodille, and others which have been designed so that they may be attached to the sterns of ordinary river rowing boats.

The weight of the Evinrude motor complete is under 56 lb., and it may be packed in a box 12in. wide and

15in. long, which may be conveniently strapped upon the carrier of a motor cycle. It is a 2 h.p. two-stroke horizontal water-cooled engine, which is capable of running in either direction by alteration of the firing point of the ignition apparatus. Either battery or magneto ignition is fitted according to requirements. The screw propeller is driven by a vertical shaft through bevel gearing, and the motor pumps its own cooling water from the river. The petrol system of lubrication is employed, and the tank has a capacity of three-quarters of a gallon, or sufficient for a six to seven hour continuous run. One-third of a pint of Vacuum A oil is required to each gallon of petrol.

A rudder controlled by a hand lever is attached to the vertical shaft casing, and all that is necessary in fitting this portable motor to an ordinary rowing boat is to remove the rudder of the boat and clamp the portable motor in its place by the screw clamps provided. The attachment has proved to be most useful for quickly reaching secluded spots, well removed from the popular parts of rivers, where fishing and bathing may be indulged in. These spots are often remote from any roadway, and are some distance from the boathouses. A boat fitted with an attachment enables these quiet retreats to be reached with ease and in comfort, for a speed of six to seven miles per hour can be readily maintained.

On the return to the boathouse the motor can be packed up and the return home made in comfort by road after a day full of varied pleasure.







### Reviving the Tricycle.

In the early days of the motor cycling era I spent a winter in very difficult country; the hills were severe and full of corners; the lanes were greasy and tortuous; and the top-heavy, high-framed bicycles of the day were very awkward things to handle. I have just spent a week in rather a similar district, and have been very thoroughly put through it by a lad of sixteen, riding a weaker mount than my own. I handled four different machines during the week, and must say that the multi-geared Baby two-stroke struck me as the pick of the bunch under the arduous conditions, its sole defect being that at the foot of a precipitous dip it was somewhat slow in picking up, as the lubrication was usually excessive during the previous drop, which might be as long as a mile in many cases; the consequence was that it sometimes baulked in my endeavour to rush the climb out of the valley. During these experiences my thoughts wandered back to similar experiences long since gone by, and I still remember gratefully how I then revolutionised my winter riding by temporarily reverting to the tricycle. In those days I had more money than brains (nowadays the situation is reversed!), and I bought successively a De Dion, an Ariel, and finally a tricycle of my own design, with more weight inside the wheelbase than the Ariel; the defects of most tricycles were that the bulk of the weight was concentrated behind the rear axle, rendering them back heavy, and the direct gear drive was excessively noisy—you could hear them grinding a mile away, like threshing machines.

### Some Possibilities.

Musing on these ideas I further recalled the successor of these antique tricycles—an Ormonde tandem two-seated motor bicycle. And methought that if some first class firm would even now concentrate on a good modern tricycle it should achieve excellent sales amongst the all-weather dwellers in country districts, especially in more difficult counties. Such a machine does not skid; its steering is unsurpassable in tricky lanes; it goes comfortably on big tyres; winter puncture repairs (the all-weather man's bugbear) are eased, because one can put in a new tube in the side wheels in five minutes, and the front wheel hardly ever punctures. Then if the wheelbase were still further elongated, and the seating altered into the tandem style, with the front rider in charge of the controls, the machine would be equally docile with either one up, or two; and the combination would, in this respect, be infinitely superior to the sidecar, now fitted by many mudlarkers, and always rather tricky to handle when "she" is not aboard.

### An Objection.

I do not consider that the extra track is of any real moment for this special market, as the machine would be intended for rough work, and in some counties you cannot find decent going for a two-tracker, e.g., a sidecar. The main difficulty is that tricycle steering

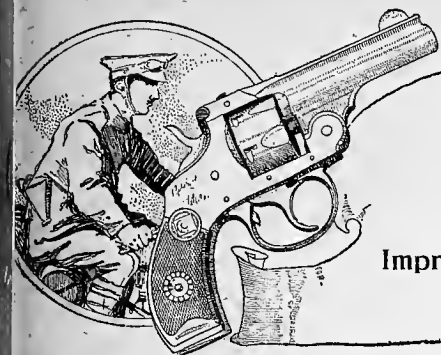
is something of a lost art. Nevertheless, it is certainly easier than sidecar steering. Any man who has never ridden a bicycle can manage a tricycle at his first essay, for the steering is natural and automatic until one has acquired the artificial balancing instincts of a bicycle front wheel; and nobody can say that sidecar steering is natural. If I were head of a firm in a big way of business I should be much inclined to put through an experimental batch of, say, a hundred tricycles, fifty tandems, and fifty single-seaters; to enter them in the big trials; to entrust a few to good riders up and down the remoter and hillier counties, and so to test the possibilities of an untried market.

### "Top Feed" Carburetters.

A correspondent asks me "to wield my vitriolic pen" in denunciation of carburetters which have the petrol feed pipe attached to the top of the carburetter instead of the bottom as aforetime; he says it is a great help in diagnosing troubles to slip the lid off the float chamber and so discover whether the fuel system is blocked. He has surely overlooked the two facts that the same test can be effected either by tickling the float and watching for dripping petrol or by noticing the feel of the tickler, which seems and sounds quite different when the chamber is empty. I have no doubt whatever that the top feed is the better arrangement; it keeps the needle steadier, and so prevents much waste of petrol and disturbance of mixture by flooding due to vibration. I have never had a conversation with an expert on the point, and there may be other advantages which have escaped my notice; but even on this one point my answer is "Declined with thanks."

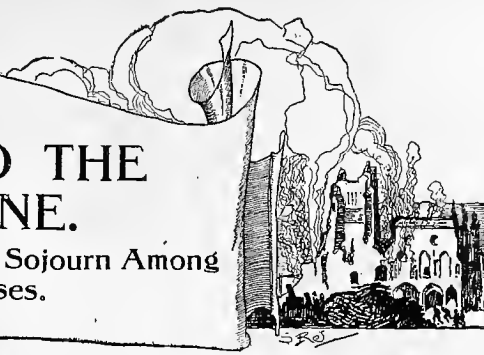
### An Engine Seizure.

I have not infrequently seized up a four-stroke engine, but never until this week did I encounter this particular mishap with a two-stroke. I was over-driving a new two-stroke, and up a very long hill signs of seizure became apparent, and as soon as I dismounted the engine became immovable. Fortunately a two-stroke is well adapted for treatment in such cases; the sparking plug is often in the centre of the cylinder head, and if one has petrol lubrication the tin is just the right thing for copious injections. I whipped out the sparking plug, mixed two tins full of equal parts of oil and petrol, and slushed them in through the sparking plug orifice, doubtless at some risk of cracking the red-hot piston; the first dose boiled and sizzled, the second went in more quietly. As soon as the second tinful was in, low gear was engaged, and the piston was rocked slowly backwards and forwards till it freed itself. Before taking the road again the usual proportion of oil in the petrol tank was trebled. When I called for supplies at the garage in the next town I mentioned my mishap, and the agent informed me that two riders of two-strokes had pushed into his shop in similar trouble on the previous Saturday.



## A VISIT TO THE WAR ZONE.

Impressions of a Ten Days' Sojourn Among the Repair Bases.



RECENT note from Lt. Rowlandson at G.H.Q. read as follows: "Next time you see Hulbert, ask him what he thinks of shell." Accordingly we sought out Mr. Hulbert, motor manager of the Triumph Cycle Co., who, we knew, had been on a visit to France with Mr. Franklin, the works manager of the company, to see the actual conditions under which Triumph motor cycles are made at the Front. We found Mr. Hulbert very communicative and deeply impressed with the perfect organisation, optimistic vein, the sense of security pronounced in and near the war zone, which forms a striking contrast to the conditions which existed in the early days of the war.

On the visit of Messrs. Franklin and Hulbert occupied ten days, during which they were transported from one place to another—thirty in all—and were out going from 8.30 a.m. until 9 or 10 p.m., seeing all there was to be seen of interest and benefit to men whose special duty it is to produce the most reliable type of motor cycle for our army in the field. Everywhere they went they were greeted with flattering remarks on the quality of the trusty Triumphs, and the satisfactory service which has been rendered by them. Naturally, they saw a good many motor cycle lists whose names are well-known to our readers, and on two days of their trip were, in fact, piloted by Lts. S. Rowlandson and C. T. Newsome, of the A.S.C. One of these days, indeed, was the most exciting of the trip.

### Using a Visitors' Book under Shell Fire.

It was a visit to Ypres, which is now but a heap of crumbling ruins, except for the prison and the water tower. To the prison they added their way, and whilst using the visitors' book with at ceremony they heard a shriek overhead, and a shell burst eight yards away and buried itself in the ruins. The visit continued for ten minutes or so, and the civilians were informed that this was quite the regular reception when a motor car visited the prison. This section is, of course, one of the hottest along the whole Front, and was, in fact, nearer to the German

line than any point touched. What puzzled Hulbert at the time, and is still puzzling him, is whether the prison being left intact was intentional on the part of the Germans or otherwise. Then, all having been quiet for fifteen minutes or so, the guides suggested quitting Ypres without delay.

A mile out three more shells shrieked overhead and fell in quick succession, but sixty yards away this time. As may be imagined, "Bush" Newsome, who was driving, fairly accelerated. At Poperinghe a search was made for Sgt. J. Cocker (M.M.G.S.), the well-known Brooklands record holder, who was formerly with the Triumph Co., and knows what a good motor cycle should be like, but, though his quarters were discovered later in another district, it was found that he was on leave. Curiously enough, he was almost the first person Hulbert met on his return to England. Another friend Hulbert was most anxious to trace was Flight-Commander H. Lister-Cooper, of the R.F.C., but it was not to be.

### The Road Conditions.

In Belgium the Triumph representatives found the roads at their worst. The *pavé* in the centre is not so bad, but the excessive camber is very troublesome to solo riders. At the sides there is any quantity of mud, which would make the most experienced rider quake. But *pavé*, the *bête noire* of tourists, is a godsend to military men, as it renders riding possible, albeit extremely uncomfortable.

The road conditions in France are a great deal better, for what is mud in Belgium and was formerly mud in France has latterly been transformed by British Engineers into a fairly rideable path. The *pavé* in the centre, too, is better. Generally speaking, our informant found the roads to be in better condition than he had pictured from the accounts he had read, and from what he had expected in view of the excessive traffic, which, near the firing line, formed one continuous line. Whereas in Belgium the motor cycles were choked with mud, and the riders complained that they had no inclination to waste time in keeping them clean, the machines on the British Front were noticeably better kept. Despatch riders were constantly seen fitting about in all directions on duty; and machine gun sidecars, too, formed an interesting change to the observers.

### No Departure in Design Contemplated.

Questioned as to the possibility of any change in design directly resulting from the visit to the Front, Mr. Hulbert said that he contemplated no radical change; and, indeed, the reports were generally that the Triumph machines were giving most excellent service despite the strenuous conditions under which they are used. Detail alterations here and there may be effected sooner or later. For instance, not unnaturally, the men find that the standard touring handle-bars are not the best for the work, and as a regular thing bend the bars outward.

As a result, the Triumph representatives took a pattern, and propose to repeat the design on future W.D. models if the desire is officially confirmed. The desirability of T.T. bars was urged in the columns of *The Motor Cycle* months ago, and in connection with the opinion expressed that important changes are not anticipated as the result of war experience, one can only reiterate that this is proof enough that the competition work in this country has evolved a machine which is able to perform satisfactory service under all conditions. This should be good reading to those officials of the A.C.U. who planned the strenuous events which created strikes and gave rise to grumbling in pre-war days.



A snapshot taken in Ypres, which gives a graphic impression of the damage done by heavy gun fire.

### A Visit to the War Zone.—

An interesting alteration on some of the machines which amused the Triumph men was the alteration of the Sturmev-Archer change-speed gear lever, so that the changes of gear might be carried out with the foot. To do this, one or two D.R.'s had fitted the lever in an almost horizontal position, and had then bent the operating lever round at right angles. This struck the writer as being a smart idea, as it enabled the gears to be changed without the necessity of removing the hands from the grips. No rider at home can appreciate this point sufficiently well. Falls are frequent owing to the slippery state of the roads, so that any departure to assist in the control of the machine should be of great benefit.

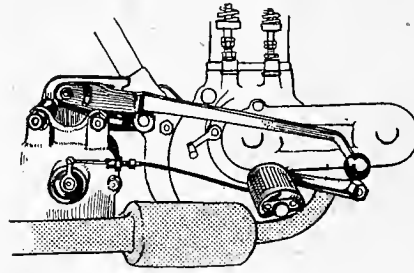
The chief repair base for cars and motor cycles covers no less than three acres of ground. In these workshops many old acquaintances were met, including E. A. Burney, A. C. Riley, S. Whitam (late of *The Motor Cycle*), F. Lamb, and others.

### Possibilities of Two-stroke Lightweights.

We enquired as to the possibilities of lightweight two-stroke machines being used at the Front, and were told that, curiously enough, this had formed the topic of conversation with a number of well-known men. Hulbert shared our view that the handy little lightweight

would be ideal for winter use when fast speeds are not necessary and the road surfaces have a thick covering of slimy mud. It would appear, too, that many practical riders are in entire agreement, but the military authorities who settle such questions do not seem favourably inclined towards two-strokes of any kind.

We have already mentioned that Messrs. Franklin and Hulbert were kept very busy during their sojourn, and frequently it was necessary for them to make enquiries at Staff Headquarters quite late at night, and they were very much impressed with the fact that Staff officers were always on tap at any hour up to midnight, Sunday included; and to suppose for one instant, as M.P.'s



Foot-operated change-speed gear on a W.D. Triumph—a war zone alteration made to many Triumphs over in France to facilitate gear-changing on greasy roads.

have suggested, that Staff officers have an easy time is entirely and utterly fallacious.

### Excitement of a Night Trip.

Night driving was most interesting to the pair. Star shells lit up the firing line, and it was quite a regular thing to see shells bursting, and that not far away. It might be added that they were not troubled with subdned lamps or lamp discs, or any impediments of that kind. Near Bethune an air fight was witnessed, and before the aeroplanes came into touch, five shells from anti-aircraft guns were fired at the Taube and were plainly seen to explode all around it.

The return trip of eighty miles to the port was commenced on a Wednesday afternoon, and took a day and a half. Nearing the journey's end, it was discovered that the boat would have left nearly two hours when the train arrived, so they sought out the military headquarters, and, the Commandant appreciating the position, kindly provided a car and driver, which enabled them to catch the steamer. But there was still an unpleasant surprise in store, for both were locked up for two hours, with a military guard over them, by the French authorities, owing to the fact that their passports had not been *visé* by the French. They were, however, released just before the boat left, and reached English soil greatly impressed with what they had seen and heard.

## More American Impressions.

### An Interview with Mr. Robertson-Brown on his Return from the United States

**W**E were very glad to have the opportunity of having a conversation with Mr. Robertson-Brown, who is the agent for the Henderson in this country, after his first visit to the United States. Asked about his impression of the condition of affairs in New York, he said that the roads were exceedingly bad in that city. It was practically impossible to ride a motor cycle except in the main avenues, the other streets being obstructed by tram-lines and paved with rough stone setts. The traffic was not nearly so well controlled as in London, and though on the whole it was not badly done, Great Britain easily led in this respect. The traffic was regulated by signals marked "go" and "stop." For all the boasts of the smartness of the American the vehicles in the streets travelled faster in London than in New York.

### Chicago Mounted Police.

The plan adopted in Chicago is to have the traffic controlled by a policeman on horseback, which Mr. Robertson-Brown considered to be a very good idea. This mounted policeman stood at a cross-road, and on his taking up his position in the centre of a certain road he stopped the traffic not only in that road, but in the road opposite to him, allowing the vehicles to pass at right angles. When a sufficient number had passed he moved in a clockwise direction to the next street, with the result that the street previously available was closed, and the street previously closed was opened. Thus, as

long as he was on duty he continually moved in a circle, and stopped at each quarter revolution.

### Not Many Motor Cycles.

Mr. Robertson-Brown noted with surprise the fewness of the motor cycles he saw in the United States during his nine weeks' stay. It appears that the motor cycle is very popular with artisans and workmen, and many even of these used Saxon and Ford cars. It seems that the average middle class man prefers a car, and the American cannot understand the Englishman's great fondness for the motor cycle. The American cannot perceive why an Englishman who can afford a car, and often owns one, should at times prefer the sporting two-wheeler. In sidecars England easily led. Sidecars are not popular at present in the States, but pillion riding is very much in vogue. He was very much astonished at the vivid colours in which American machines were painted, the Harley-Davidson and the Henderson being the only machines which wore a moderate hue. He did a certain amount of motor cycling while in the country, and rode twenty-five miles out from New York, and found the road surface quite good in that district, and also around Boston, if one kept to the main highways. He only once saw one of the famous New York motor cycle policemen. These men chase a motorist who is driving too fast, and when they catch him deliver a summons on the spot. He was extremely surprised to see the amount of horse traffic in New York, and thought it was certainly more pre-

valent in this city than in London, and was horrified to see steam and horse trams still in use in some streets. During the whole of his stay he only once saw a woman riding a motor cycle.

### A Collision.

He told us an amusing story of how young Mr. Henderson, of the Henderson Motor Cycle Co., when handing him over one of the new 1916 Henderson machines for trial, refused to let him start because he was wearing no hat. Mr. Robertson-Brown is, generally speaking, one of the hatless brigade, which apparently has not been heard of in America. He was once a witness of a collision between a motor cycle newspaper delivery carrier and a tram. The tram was obviously in the wrong, but the driver thereof got two witnesses on his behalf. When Mr. Robertson-Brown went up to the motor cyclist and asked him if he could be of any assistance, the tram driver was most indignant, and in language more forcible than polite told him to get on the sidewalk, where he belonged. Quite a long argument ensued, but as soon as one man had come forward to champion the cause of the motor cyclist others were soon available.

We were very much interested to hear Mr. Robertson-Brown's views of the States. Usually the people one interviews after a visit to America are those who have been over several times before, and who are consequently not so vividly impressed as those who are visitors for the first time.

# THE ARRIVAL OF THE 1916 MODEL

# American EXCELSIOR

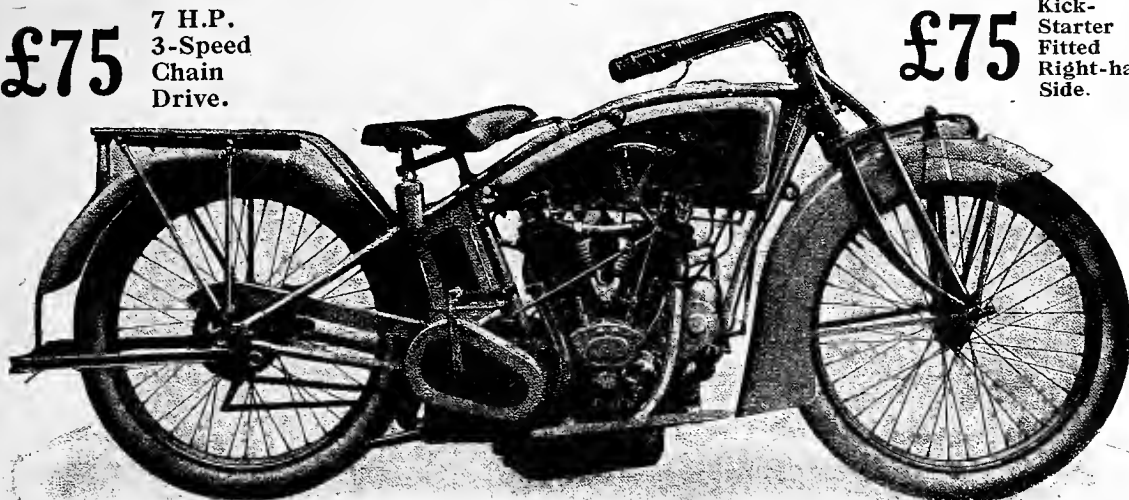
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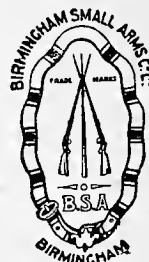
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## TRIAL of a 1917 Model 4 HP. Douglas.

Nearing the summit of Weston Lane, near Bath.

### A Tour of the Douglas Works. Hill-climbing with W.D. Models.

**L**AST week we were invited to pay a visit to the works of Messrs. Douglas Bros., of Bristol.

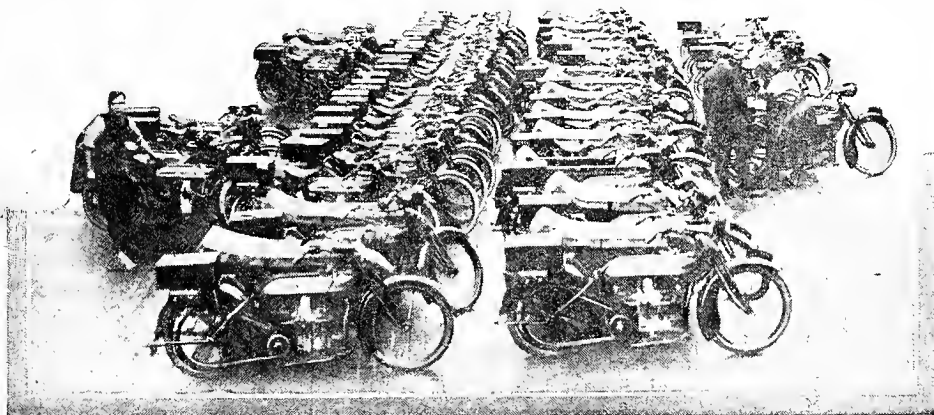
Our visits to the Douglas Works are not nearly so frequent as we should like them to be, and the transformation scene on each successive visit is really something at which to marvel. Year after year the works have been extended, and the output of motor cycles correspondingly increased, until now the firm have a huge factory with the most modern equipment. It is practically self-contained; indeed, we know few motor cycle manufacturers who produce more of their own machines in the works than is done in the Douglas factory. The extensions are not yet complete, however, and Mr. Douglas talks of a weekly output of 500 machines after the war. For some time the firm have had an iron foundry as well as a foundry for brass and aluminium castings, but the latest addition is equipment for aluminium die castings, which are likely to be much heard of in the future. On our arrival at the works A.S.C. men were busy putting through their paces in instalments a batch of machines

representing the weekly output of Douglas 2¾ h.p. and 4 h.p. models for the Army. The practical and workmanlike black finish of the different parts evokes praise, and we shall be surprised if W.D. models do not figure in catalogues when the Germans are beaten!

#### A New 4 h.p. Douglas.

After a tour of the works in company with Mr. W. W. Douglas, during which old memories of the Douglas were constantly revived, we inspected an entirely new model 4 h.p. sidecar outfit which represents the firm's 1917 design, though certain modifications may be made as experience dictates.

Surely this is the first 1917 model yet heard of, and by reason of the fact that it is so far ahead of the



Part of the weekly batch of Douglas 2¾ and 4 h.p. models for the War Office.

### Trial of a 1917 Model Douglas.—

times, some details of it should prove particularly interesting. The machine has now completed 2,000 miles of wintry roads. Regularly every day it traverses a long distance in the hands of a tester, who sends a telegram on arrival at his journey's end, and the firm have made a rule that no work or attention shall be given to the machine. The chief departure from standard is the all-chain drive enclosed in chain cases. The engine is supported upon a double platform, providing greater rigidity, and has, of course, the latest mechanical lubrication system, with an inspection window in the crank case sump already described. The bore and stroke are  $72 \times 68$  mm. = 544 c.c., the cylinders having been redesigned and the fins rounded off, giving them a very neat appearance. In the new

shafts being on the same level. The changes of speed are effected by a clever design of interlocking lever situated in the usual Douglas position at the forward end of the top tube. The handle is hinged, while the vertical rod has a telescopic action, preventing the rider changing gear until the clutch has been released. By this means damage to the gear teeth by novices accidentally changing gear without declutching is precluded.

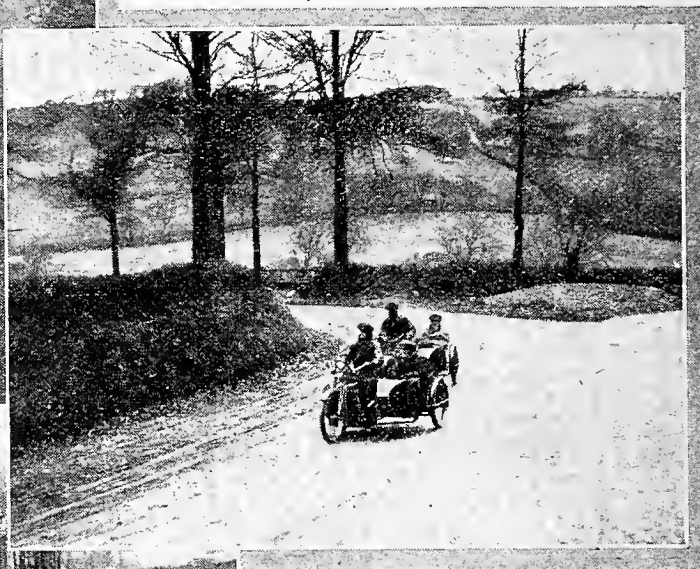
A decided improvement is the transference of the kick-starter from left to right, and a further advance is the greatly simplified method of operating the clutch. The action of this member is now governed through the centre of the shaft from the opposite side to the present model, thus doing away with the numerous springs, bolts, nuts, etc., which not only complicate manufacture but also hamper the overhauling process.

### The New Plate Clutch.

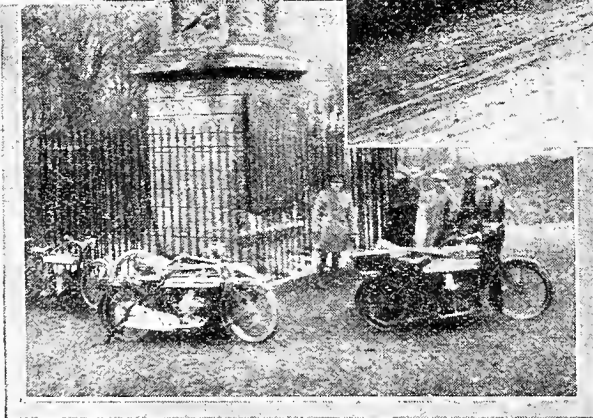
The clutch has plates consisting of specially prepared leather, which are dropped loosely into position, and by reason of the fact that they are not



J. Phillips climbing Weston Lane, Bath, on a  $2\frac{1}{2}$  h.p. W.D. model, followed by a 4 h.p. sidecar outfit.



Near the top of Lansdown Hill. A 1916 and 1917 model sidecar outfits.



The old monument at the top of Lansdown Hill, bearing the date 1643.

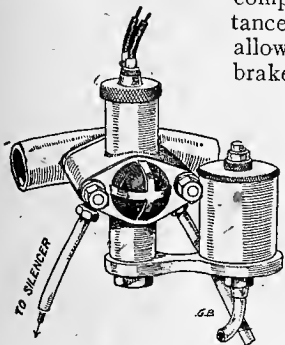
pattern cylinder casting the ports are arranged tangentially; former 4 h.p. models have straight outlets. The interior design of the ports now approaches streamline formation, enabling free egress for the burnt gases. The gear box and clutch, too, are of a new type. The box has a smooth exterior to prevent dirt collecting, and three ratios of speed are provided, the

fixed in any way, it is a simple matter, should it be necessary, to add a plate when the original ones have worn down. The method of testing this clutch will interest not a few as showing the care and precautions taken to ensure that something practically indestructible is adopted. The machine was placed against a wall and for two hours the clutch was constantly engaged with a view to burning out the plates, but without success. It will be some guide to readers to know that a cork clutch subjected to the same treatment gave out long before the new composition plates. On this new 4 h.p. model is fitted the latest type of Douglas fork with shock absorber combining a horizontal motion

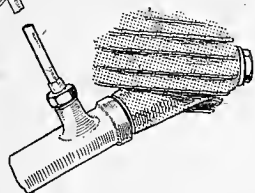
**Trial of a 1917 Model Douglas.—**

with the upward motion, and the sturdiness of its construction cannot fail to be noticed.

Another entire departure for the Douglas firm is the adoption of detachable wheels—a patent of the company dispensing with distance pieces, and, of course, allowing the transmission, brake mechanism, etc., to remain *in situ* when the rear wheel is dropped out by the removal of the spindle. The rear brake is of the internal expanding type with the operating lever mounted separ-



The latest design Douglas-Amac carburettor, which has a warming jacket, heated by a pipe from the front exhaust pipe. A second pipe communicates with the silencer.



ately from the footboards. As to the power of the foot brake, we had ample proof during tests which we were later privileged to carry out. This new 4 h.p. Douglas makes an ideal sidecar mount, it is not heavy and cumbersome, and as a result is economical in petrol and oil consumption and comparatively light on tyres. The machine will be sold complete with a very neat coach-built sidecar, the *tout ensemble* presenting a very pleasing appearance. The sidecar is attached to the bicycle by four separate connections, and at present the body is suspended on coils at the front, and a transverse spring at the rear.

**On the Road with the 1917 Model.**

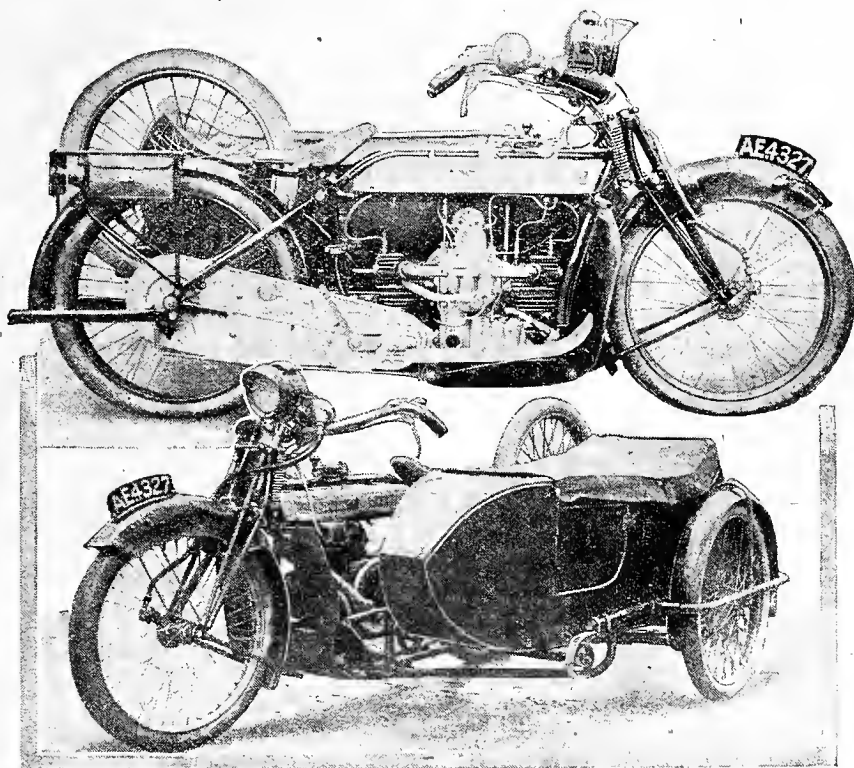
It was the 4 h.p. 1917 model that we selected as our mount to go in company with the 2¾ h.p. and 4 h.p. War Office models which were to be demonstrated to us on Lansdown Hill and Weston Lane, near Bath. These two hills are well known to West-country riders, and have frequently figured in competitions. The machine we were on made very light work of Lansdown Hill, simply toying with the gradient on the lowest gear, and showing its ability to restart on the steepest section with three passengers. Even the combined efforts of heavy roads and a howling gale beating the rain into our faces could not suffice to hold up the hill-climbing Douglasses. At the top we paused awhile to examine an old war monument bear-

ing the date of July 5th, 1643, where "In this battle on the King's part were more officers and gentlemen of quality slain than private men."

Weston Lane was in a particularly bad state owing to continued rain, the chalky surface adhering to the wheels with remarkable tenacity. To climb to the summit from the village is a test for any passenger outfit—the bicycles we almost ignore, for Phillips, the erstwhile competition rider, flashed past us on two occasions on his upward flight, proving that the gradient was nothing to a good Douglas bicycle, whilst W. W. Moore (our skilful pilot) demonstrated that a restart could be made without difficulty on the steepest portion of Weston Lane.

**Testing the Weatherproof Qualities.**

After lunch at Bath, during which time the rain continued to beat down pitilessly, we had a fast run home through Hanham over roads churned up by the heavy traffic and abounding in surface water. Mr. W. W. Douglas, who was piloting our photographer on a W.D. 4 h.p. model, was doing his very best to draw out the 1917 model, particularly on hills, in order to observe the difference, and it is enough to say that the pace was hot! But our horizontal twin never faltered, save once, when a blob of mud was flung on to the front plug, but without dismounting it was removed with a rag and the engine continued to fire merrily. The kick of the new 4 h.p. is amazing. The makers have so specialised on this engine that they have now no hesitation in asserting that it is at least as good *pro rata* as the 2¾ h.p. model—and that is saying a good deal. Its balance and smooth running qualities are such that an experienced rider could not detect the absence of a shock-absorber in the transmission.



The 1917 Douglas 4 h.p. sidecar outfit. It has enclosed chain drive, detachable wheels and a redesigned engine and three-speed gear box.





## SPECIAL FEATURES

A VISIT TO THE WAR ZONE. HILL-CLIMBING IN GLOUCESTERSHIRE.  
A TRIAL OF A 1917 MODEL 4 h.p. DOUGLAS.

## TIME TO LIGHT LAMPS

GREENWICH TIME			
Feb. 10th	...	...	5.30 p.m.
" 12th	...	...	5.34 "
" 14th	...	...	5.38 "
" 16th	...	...	5.42 "

## A Road Warning.

The Evesham-Cheltenham road is in a very bad condition, "pot-holes" being abundant.

## Cycle and Motor Cycle Trades Benevolent Fund Concert at Birmingham.

The seventh annual Bohemian concert took place at the Grand Hotel, Birmingham, on Saturday last. Several short addresses were given, and it was pointed out that, with a centre membership of 850, £630 had been distributed in relief during the past year. A number of new members were secured in the interval for refreshments. The members of the centre were previously entertained at tea by the president, Mr. Dover.

## AN ITALIAN MOTOR CYCLE WITH AN AMBULANCE TRAILER.

## By Road to the Races.

It has been announced that trains are not available for race meetings, consequently all those who journey down to Kempton Park have to go by road, with the result that the stalls and paddocks where thoroughbreds used to stand are now occupied by motor cycles.

## A Warning.

An officer recently had occasion to take his machine from Victoria to Euston, but, finding that it would not fire, and being pressed for time, left it in a neighbouring garage to be overhauled and cleaned. Four days later he called for the machine, and was presented with a bill for £1 17s. 5d. He protested that the machine had not been cleaned; the manager refused to look at it, but deducted 1s. from the bill. Also 6s. was taken off in respect of two Lodge plugs which were not required, 2s. being charged for their

use (without instructions). The sole fault in the machine was that one of the magneto brushes had stuck. The moral of this is, of course, that it is always wise to obtain a written estimate when dealing with strangers.

## A Transfer to the R.F.C.

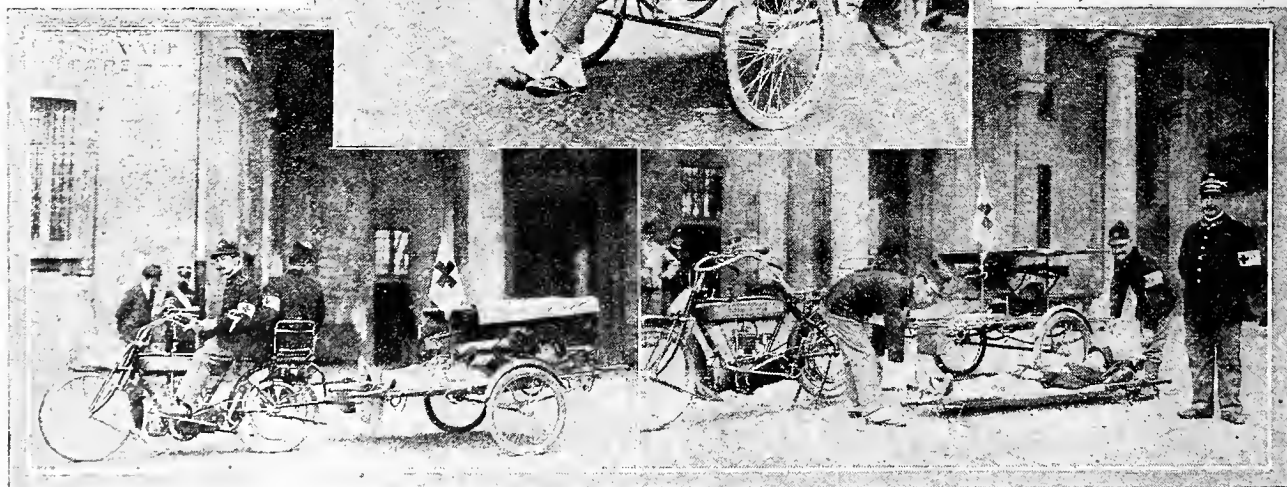
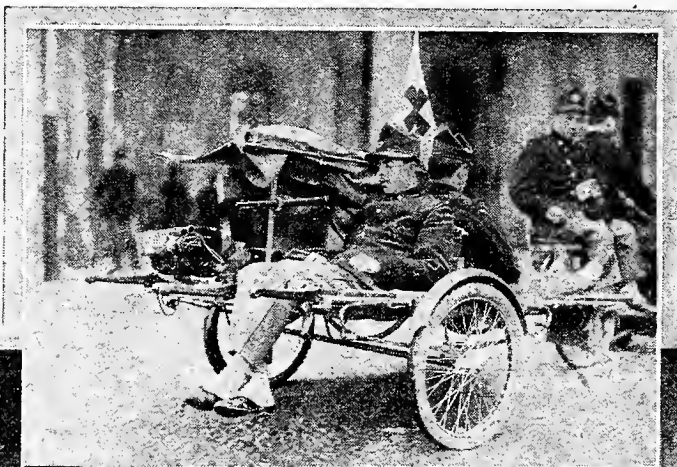
On Saturday we met 2nd Lient. John Gibson on the road near Stratford-on-Avon, and were interested to learn that he has been successful in obtaining a transfer to the Royal Flying Corps, and is at present receiving instruction in aeroplanes at Reading, where Harold Karslake is the sergeant-instructor.

## Bristol-Tewkesbury Road.

The Bristol-Tewkesbury road is in a really terrible condition at places, there being at least 3in. or 4in. of liquid mud after a fairly heavy shower of rain. This is apparently due to the amount of heavy traction engine traffic which passes over it.

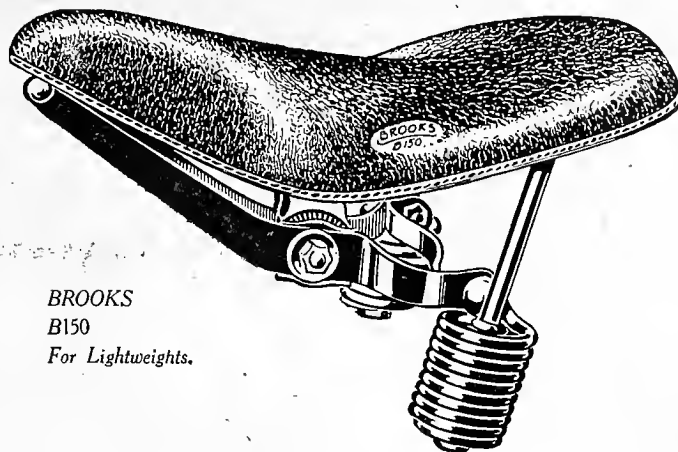
## A.C.U. Subscriptions.

The A.C.U. secretary reports that a number of members of the A.C.U. are renewing their subscriptions for 1916. Many of these communications have been received from officers and men who are in the trenches, and from others who are serving their country in various parts of the British Empire and abroad.



A motor cycle trailer ambulance constructed by Messrs. Stucchi and Co., of Milan, in use in the Red Cross Service of the Italian Army. It will be observed in the right-hand photograph that accommodation is made for the soldiers' rifles on the cover supports. When loaded up with four people as in the left-hand photograph, we can well believe that the motor bicycle has a very busy time on the Italian mountain passes.

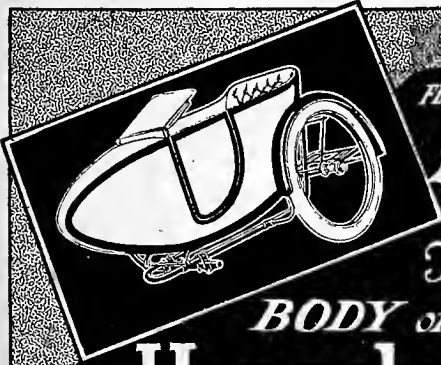
*The rider of a  
BROOKS B150  
knows that in one  
respect, at least, his  
lightweight mount  
cannot be improved.*



BROOKS  
B150  
For Lightweights.

*In comfort, in quality, and in appearance,  
BROOKS B150 is very much superior  
to any other lightweight saddle made.*

J. B. BROOKS & CO., LTD.,  
49, CRITERION WORKS,  
BIRMINGHAM.



**FEATURE TWO**

*The*  
**BODY of the**  
**Hercules**

is roomy and comfortable ---  
there is no boxed-up feeling &  
no cramped sensation during  
even the longest ride. Lux-  
uriously fitted and uphol-  
stered. The many coats of paint  
ensure long service without  
the usual rapid depreciation  
in appearance whilst the beau-  
tiful Hercules lines are famous.  
HERCULES CYCLE & MOTOR CO. LD:  
7 CONYBERG ST. BIRMINGHAM

**SPECIAL**

**LODGE**  
**WEATHERPROOF**  
**5/-** **PLUG**



No exposed terminal.

All high-tension metal parts totally enclosed and protected from rain and mud.

Insulated cable terminal instantly detached.

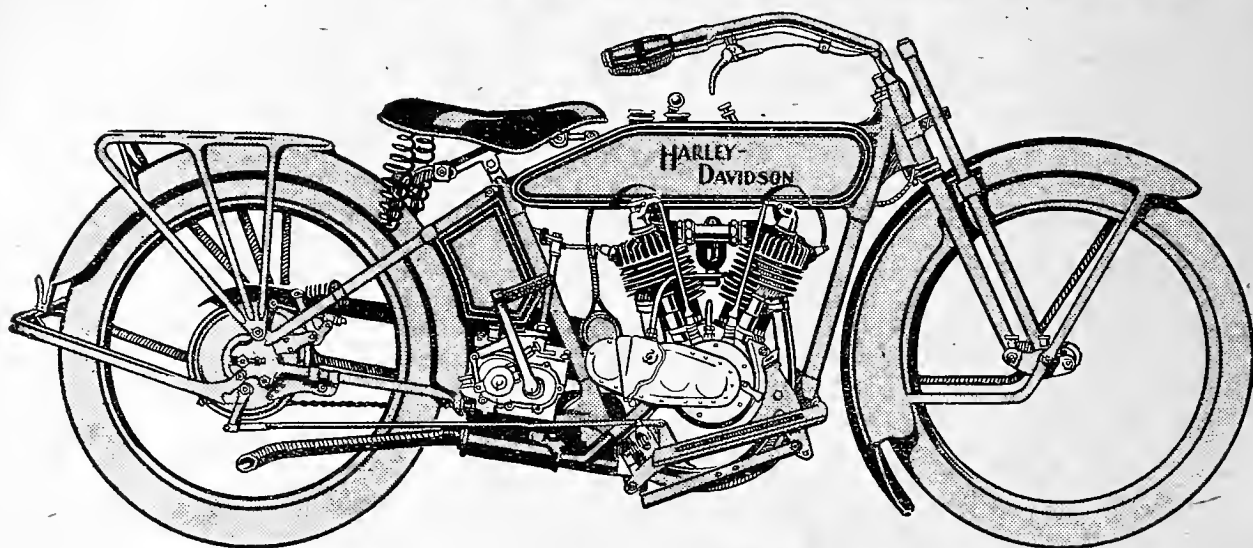
The ideal plug for motor cycles.

Adopted by the Triumph Co. for all their machines

The LODGE Sparking Plug Co., Limited, BIRMINGHAM.

*In answering these advertisements it is desirable to mention "The Motor Cycle."*

# HARLEY- DAVIDSON



## As Silent As A Shadow

The most Powerful, Flexible Engine ever  
— built into a Motorcycle —

Smooth, Sweet-running Transmission, and Perfect Lubrication, are features par excellence of

## “The Silent Grey”

### ALWAYS A WINNER

Single and Twin-cylinder Models in Stock and Sidecar Combinations

*Fully Illustrated 1916 Catalogue Post Free*

**HARLEY-DAVIDSON MOTOR CO., LTD**

**21, Harleyson House, Newman St., London, W**

*In answering this advertisement it is desirable to mention “The Motor Cycle.”*

**Protecting the British Magneto Industry.**

It is suggested by the Sub-committee of the Advisory Committee to the Board of Trade that a tariff of 33½% be imposed on foreign magnetos, for the protection of the home industry, after the war.

**Ladies' Motor Cycling Costumes.**

It may interest feminine readers to know that the copyright of the *Ladies' Field* costumes designs illustrated in our last issue is held by Mr. H. A. Beal, of 287, Regent Street, W.

**Ford Tales.**

The number of Ford yarns which have been sent in reply to the paragraph in the last issue is amazing. A great many of the jokes, however, have been repeated at least six times over. The favourite "chestnut" at present appears to be the one relating to the man who could name any make of car by the sound of the exhaust, but a revised version may be necessary for publication!

**Exclusive Contents of This Number.**

The present issue is one of exceptional interest on account of its newsy and exclusive features. In addition to giving the first illustrated report of the Gloucestershire hill-climbing expedition held last week-end, we describe and illustrate a 1917 model 4 h.p. Douglas chain-driven sidecar outfit, and further relate our experiences with it. An article of particular interest is the one giving the impressions of manufacturers' visits to the war zone. A new Italian motor cycle trailer ambulance is illustrated on page 134, and a method of combining motor cycling and motor boating is shown in attractive illustrations on pages 126 and 127. An original article appears on pages 124 and 125 entitled "Highways and Byway with Brush and Canvas." The technical side is covered by a very practical article, "Commonsense and the

Motor, and a review of recent patents. The January motor cycle import and export figures are included. In a word, an issue of absorbing interest!

**The National War Funds.**

At the week-end the principal relief funds stood as follow:

The Prince of Wales's National Relief Fund (£2,978,000 distributed) ..	£5,738,641	0	0
Fund for the Sick and Wounded ..	3,286,172	0	0
Tobacco Fund ..	98,724	0	0
The Belgian Relief Fund ..	1,311,854	0	0

**Nailsworth Ladder.**

Anent the hill-climbing exhibition in Gloucestershire last week-end, on which occasion no sidecar succeeded in making the climb, it is interesting to note that as long ago as 1913 W. H. Carson made a clean ascent with passenger on a 5-6 h.p. Excelsior big single and sidecar. On another occasion F. C. North, driving a 5-6 h.p. twin Ariel and sidecar, with a member of our staff as passenger, also succeeded in accounting for the difficult ascent. Of this pair, Carson is opposed to Sunday events in war time, and North is on Active Service in France.

**A Derbyshire Hill-climbing Performance.**

Not only in Gloucestershire but also in the Derbyshire district motor cyclists were out and about last week-end on the look out for steep hills, the hill-climbing mania usually arriving with the spring! G. W. Wilkin, the competitor who made a striking performance in the last Six Days Trials on a 2½ h.p. Levis machine, has been showing what his machine is capable of when fitted with a light sidecar attachment. Wilkin is the agent for the Levis machine in Sheffield, and advertised his hill-climb for the week-end. He succeeded in climbing Mam Nick, near Castleton, with three passengers, and also made an ascent of Sir William Hill (one of the Six Days Trials test hills) with a human freight of 48½ st.

**The Horizontal Two-stroke Engine.**

The Connaught Company's claim in the correspondence pages of our last issue has aroused interest. Who produced the first two-stroke horizontally-opposed engine, a number of which have been described and illustrated in our pages? Certainly one existed four years ago, and we have seen it. We shall refer to the subject again anon.

**The Powerplus gets to Work.**

Erwin G. Baker, who recently travelled from the United States to Australia with a view to demonstrating to Australians the speed capabilities of the Powerplus Indian, has got to work. He has already lowered the following Australian road records:

Three hours, 116 miles.

Six hours, 316 miles.

Two hundred miles, 3h. 42m.

The above were accomplished on Victorian roads, and under the auspices of the Victorian M.C.

A later Baker achievement is the covering of 1,027 miles in 21½h., which is also claimed as an Australian record. The average speed in this case equals 45.2 m.p.h.

**Proposed Trial for Service Men at Easter.**

It was resolved at a recent meeting of the Birmingham Motor Cycle Club to hold an open reliability trial for Service men and Armyleters on Easter Monday over either an out and home or a circular course in the Midlands. Entries are invited from all men likely to be able to obtain leave on that day, and application for particulars should be made to Mr. S. C. Perryman, Warwick Works, Tame Road, Witton, Birmingham.

**An Autocratic Announcement.**

The Chief Constable of Manchester recently issued warnings to the effect that a speed exceeding ten miles an hour at night will be considered as driving to the danger of the public, whether there is immediate and visible danger or not. The A.A. and M.U. fought a test case on this ridiculous announcement on January 20th, and the motorist stated that his speed was twelve miles per hour, and he accelerated for a short distance to overtake another vehicle. The charge was dismissed, thanks to the A.A. solicitor who defended.

**January Imports and Exports of Motor Cycles.**

Foreign imports of motor cycles show a decline compared with the first month of 1915, whereas British exports show a substantial increase. The Board of Trade Returns are given hereunder:

IMPORTS.			
	1914.	1915.	1916.
Number ...	183	125	15
Value ...	£6,351	£5,461	£721
Parts ...	£6,163	£10,621	£19,196
Total imports for January, 1916, £19,917.			

The striking increase in the value of parts imported as well as exported will be noted.

EXPORTS.			
	1914.	1915.	1916.
Number ...	1,432	670	836
Value ...	£62,838	£29,354	£39,463
Parts ...	£20,754	£16,342	£31,602
Total exports for January, 1916, £70,065.			



UP MAM NICK, NEAR CASTLETON.

G. W. Wilkin making the ascent on a 2½ h.p. Levis sidecar with three passengers. He also climbed Sir William Hill with the same load.



# A MANUFACTURER'S VISIT TO THE FRONT.

## An Interview with Mr. B. Marians.

**M**R. MARIANS, the managing director of Messrs. Phelon and Moore, Ltd., is one of the manufacturers of Government motor cycles who have been privileged to pay a visit to the British Army in Flanders. Mr. Marians and his party called at all the important air depots and at some of the outlying squadrons, so close to the firing line that the flashes of the guns could be seen, and finally ended up by a visit to Headquarters. Various consultations were held as to the improvements desirable to the machines, and also the question of the organisation of spares was gone into, which is a very difficult matter, as each squadron is an independent unit.

In the course of his wanderings, he met Capt. A. E. Davidson, D.S.C., who promptly offered him a ride on his own machine. Mr. Marians was not garbed for the purpose, but expressed his willingness. This is an old joke of the gallant captain, who asks every motor cycle manufacturer if he would care for a ride on one of his own mounts, with the result that the said manufacturer's face falls with the rapidity of a barometer foretelling a cyclone!

Everywhere near the Front the mud was appalling. Mr. Marians told us it was like living in a ploughed field in winter time. He was pleased to be able to report that P. and M. machines were doing extremely well. Trouble was expected with such details as mudguard clearances and rims, but there was no trouble as regards the former detail and very little with the latter. The only improvements really found to be necessary are a simplification of the design of the spring forks. The bottom portion in future will consist of plain shackles fitted with large bearings and greasers, otherwise the P. and M. machines will be practically the same as in 1914. Numerous sidecars are being used by the R.F.C. They are of the Mills-Fulford corvette type, and all are attached to single-cylinder machines, so as to avoid complication in the supply of spare parts.

### Spare Sprockets Wanted.

The question of gearing was interesting. The machines are fitted with standard gears, but Mr. Marians found that those who had long distances to go want high gears, and those who have to go forward

with the batteries want low gears. Here, again, the question of spare parts precludes any alteration in the gear ratios. Asked as to the effect the war was having on the design of motor cycles, Mr. Marians said that the motor bicycle was undoubtedly being developed, and for special conditions was being made heavier and stronger. Thanks, however, to the chain transmission being entirely enclosed no trouble whatever is experienced with chain drive. He told us we would be surprised to learn how much night riding was done, and it was quite common for a man to be called out at 1 a.m. to do a journey of eighty miles. As we have mentioned before, head lights are used, and there is a demand for still bigger lamps. The P. and M. machines employed by the Flying Corps are used for despatch riding and keeping in touch with the batteries, while the sidecars are employed for taking about officers, carrying portable wireless sets, the mails, and even sacks of coal. Mr. Marians was absent for about eight days, and said that his experiences were of the most interesting and instructive nature, and would never be forgotten for the rest of his life.

## "WE TOLD YOU SO!"

### Petrol 2/6 a Gallon!!!

**T**HREE weeks ago *The Motor Cycle*, speaking of the recent announcement by the Shell Petrol Co., and the possible shortage of fuel, stated that the "scare" heralded an increase in price. As regards a shortage, we may recall import figures published in our issue of January 20th. In 1913, a peace year, 100,853,017 gallons were imported, whereas in 1915 the total was 144,939,700. That our prophecy was correct is proved by the announcement made in the latter part of last week to the effect that Pratt's motor spirit was raised 4d. a gallon, the old prices being (I.) 2s. 2d., (II.) 2s. 1d., and (III.) 2s., as against the present inflated figures of (I.) 2s. 6d., (II.) 2s. 5d., and (III.) 2s. 4d. These prices are for England and Wales, and it is usual to add another 1d. for Scotland and Ireland.

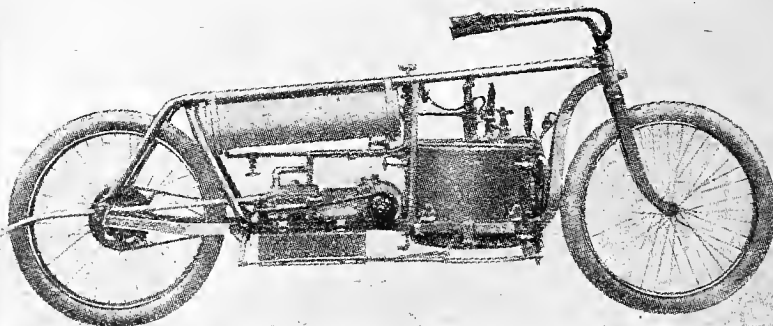
As the moment of writing, Carless petrol is 2s. 2d. for the first grade, but by the time these lines are in print this price may have gone up to the same as Pratt's. Shell at the present moment has not gone up, but here, again, it is likely that by the time this appears in *The Motor Cycle* it, and other brands, will have come into line.

Last Monday's *Financial Times* states "The Anglo-American Oil Co. has been attacked for initiating the rise, but, as we have pointed out repeatedly, it is not a case of any combine attempting to squeeze the consumer, but merely the result of the law of supply and demand." It is pointed out that America is not suffering from the over-production of petrol, and, at the same time, the use of the self-propelled vehicle has increased

enormously in that country. Furthermore, the cost of materials has been greatly increased owing to the war (tin plates, for example, have doubled in price during the past twelve months; these, of course, are used for the manufacture of petrol tins); finally, there is a shortage in transport. Petrol is also going up in America. A year ago it was fifteen cents per American gallon; to-day it is thirty-five and a half cents, and is expected to go up to forty and even fifty cents in the future. In America, it must be remembered, there is no 6d. duty. *The Financial Times* goes on to say: "We have on several occasions dealt with the

petrol problem, and have urged the Government to enforce economy in the use of the spirit by the ordinary private consumer." This we consider to be a somewhat significant statement. It looks very much as if a still further increase in the cost of petrol would be imposed.

We recently asked Mr. T. W. Loughborough, secretary of the Auto Cycle Union, his views on the present state of affairs, and he said that he thought the price of the fuel might go up to 3s. a gallon without seriously affecting the motor cyclist, whose machine averaged something like seventy-five miles per gallon as regards consumption.



ANOTHER STEAM MOTOR CYCLE.

The long round tank attached to the top of the frame holds petrol for getting up steam, and water is carried in the square tank beneath the engine. A reverse gear is fitted, which is desirable, as the wheelbase is 6ft. 3in.! The weight is 350 lb. Needless to say, an American is responsible for this latest addition to the ranks of "lightweights," and we are indebted to our Chicago contemporary, *Motor Cycling and Bicycling*, for the illustration.

## TWO-STROKE DESIGN.

### \*MR. J. MARTIN'S REPLY TO HIS CRITICS.

I HAVE to thank the various correspondents who have taken the trouble to join in the discussion on my article, "A New Two-stroke Engine," and before replying to them individually would like to say that when writing the article, I had in mind the more recent developments in two-strokes, and my criticism was intended more for the engines having a capacity of 500 c.c. and over. As I mentioned in the beginning, it was only when you got to the bigger engines that the faults became pronounced, and this explains why there are no  $3\frac{1}{2}$  h.p. or 4 h.p. two-strokes with single cylinders and air-cooling.

Again, the terms flexibility and economical consumption of petrol are only relative terms, and what one rider would call flexibility might strike another as quite the opposite, and it is only when figures are given that one can arrive at a comparison. For instance, "Rolyat" says the two-stroke he is riding is far more flexible than any four-stroke he knows, and gives as proof the fact that it can run between six and twenty-six miles per hour without misfiring. This gives a ratio of  $4\frac{1}{3}$  to 1 between his highest and lowest speeds. Now against his figures one can take what is, perhaps, the best known four-stroke single-cylindered engine with mechanical compression release such as I proposed adopting, and that is the  $3\frac{1}{2}$  h.p. Ariel, the makers of which claim that it can be walked at three miles per hour without misfiring, this result being due to allowing part of the mixture to escape on the compression stroke. I suppose the maximum speed of this machine is not below fifty-two miles per hour, which gives a ratio of  $17\frac{1}{3}$  to 1, i.e., four times better than "Rolyat's" two-stroke, so on his own figures his engine shows up badly.

#### Ton-miles per Gallon.

As regards his petrol consumption, 120 miles per gallon is very good and is much over the usual, but as he does not give any details of his weights, etc., it is very difficult to judge. Assuming his machine weighs 140 lb. and he himself another 140 lb., then he is getting 15 ton-miles per gallon. As this stands it is not too much, for four-stroke multi-cylindered engines can do 45 ton-miles to the gallon! I admit they are car engines, but they have the essential feature of variable compression and good scavenging.

I cannot quite follow "Norman's" argument about the four-fifths air and one-fifth petrol vapour expelling the exhaust gases when the throttle is opened one-fifth. Where does the four-fifths air come from? It cannot come *via* the carburetter, unless you have an extra air inlet, and then all you get is a very weak mixture, all combined in one, and this is not what is wanted, for it only keeps the compression pressure constant. Regarding his other statement that the mixture does not become stronger if the piston has to go through another cycle before firing, he is in error, for no matter whether the mixture is fired or not, every time the piston moves up and down a certain amount of petrol vapour passes from the crank case into the cylinder.

Again, Mr. Bellingham mentions the Scott as a two-stroke which does not four-stroke, and which can run slowly. As I said, this machine stands in a class by itself. At the same time, it must be remembered that it has the advantage of water-cooling and twin-cylinders, and the number of power impulses equal that of a four-cylinder four-stroke engine, and I hardly think that its most devoted admirers can claim it has the flexibility of the latter.

#### The Necessity of Simplicity.

I can quite understand the mixed feelings of the Bordesley Engineering Co. It would not do for them to slate the new design and then admit they have patented the same idea, and yet they cannot run down the constant compression engine, for it is what they make at present. As I said in my article, as long as the engines had a small capacity things were fairly satisfactory. I quite admit, when a firm is marketing lightweight machines, simplicity and first cost are the chief considerations, and it would be an open question whether it is advisable to add extra mechanism to this class.

I am glad to notice that Mr. Hughes finds the reduced pressure in the cylinder gives a cooler engine, which is as it should be, and I admit that a reasonable amount of exhaust gas does no great harm. This cannot be avoided, but what constitutes a reasonable amount is a very debatable point—I should say 15% or 20%, but in two-strokes it must touch 75% or 80% when the throttle is in the lower settings.

#### A 1907 Invention.

The question of patents does not interest the average reader much, but the idea of passing back gas or petrol vapour from a cylinder to a transfer chamber is a pretty old one. I have a copy of a 1907 specification which covers it, so I hardly think it will stand now. I can assure the Connaught Company that the drawing which appeared with my article is over a year old, and in view of this 1907 invention, I did not think it worth patenting without other features. I went into the matter deeply a year ago and came to the conclusion that there was a constant passing of new gas from the inlet to the exhaust port over the piston. I put this loss at 10-15%, and was very much surprised to learn from an article in the *Automobile Engineer* that I had greatly under-estimated it, and that it ran up to 37%, which is really out of all reason.

The author evidently knew what he was talking about, and seemed to have no doubt about his figures. I think he got at that figure by analysis of the exhaust. The solution of this difficulty is the only thing worth patenting, and I could not explain my design in my paper, for I am still engaged in detail work.

My apologies are due to the Bordesley Co. in reference to experimental work, for I was under the impression that they were a controlled firm.

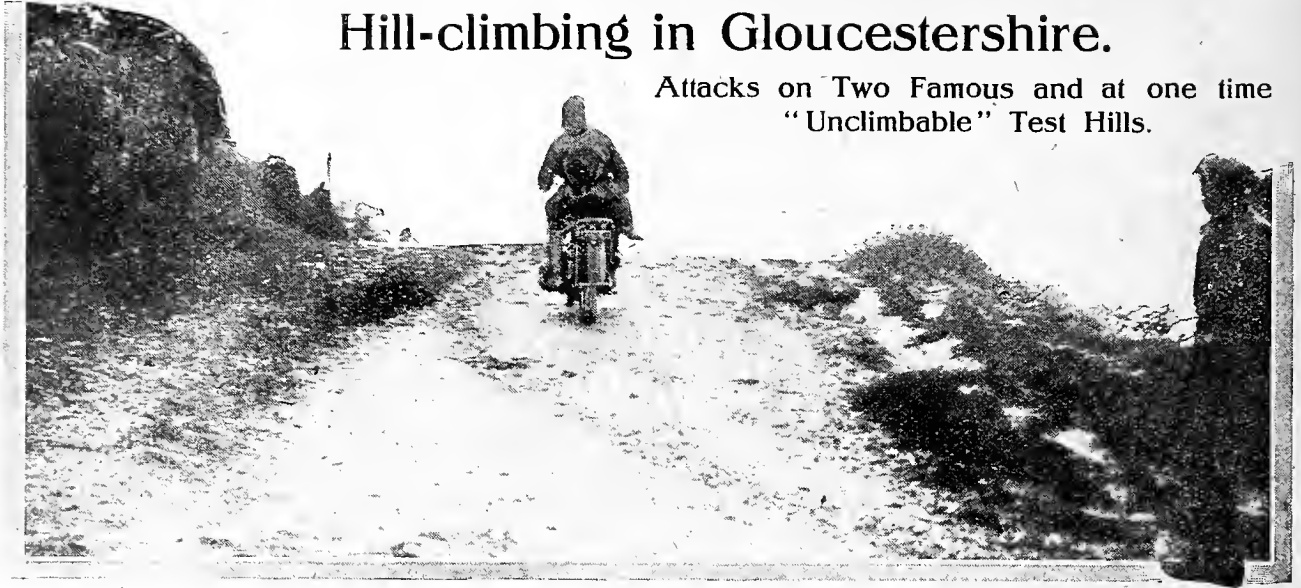
In conclusion, I should like to say that it has given me great pleasure to see the interest taken in the variable compression idea, and that my article has opened up a new source of thought for discussion.

JAMES MARTIN.

\* Mr. Martin's original article appeared in "The Motor Cycle" of January 20th, pages 46 and 47.

## Hill-climbing in Gloucestershire.

Attacks on Two Famous and at one time  
"Unclimbable" Test Hills.



Safely over the summit of Nailsworth Ladder.

Sunday competitions to ninety per cent. of motorists are unpalatable, and we have openly stated our views upon them on several different occasions. In war time in particular we must repeat our strong disapproval of them, as nothing is more likely to bring motor cycling into disrepute. The expedition described below was not arranged by "The Motor Cycle," but six separate invitations to attend reached us, and we give below the first illustrated description of the proceedings. Finally, we may express the hope that Sunday contests of the kind will not be continued.

ON Saturday evening the Plough Hotel, Cheltenham, really presented an appearance which reminded one of bygone competition days. A goodly number of motor cyclists were assembled, including a few well-known figures. They were assembled for the purpose of making an early start on Sunday morning to attempt the ascent of two famous Gloucestershire test hills, namely, Gambles Lane, also known as Rising Sun, at the top of the Cleeve Hills, Cheltenham, and Nailsworth Ladder, near Stroud. After being accustomed to the darkened streets of London or the busy manufacturing Midland towns, the sight of the streets being a blaze of arc lamps, with many illuminated flashing signs, would have led one to suppose that "peace had broken out," had it not been for the number of uniformed soldiers, including several wounded, to be seen in the brilliantly lighted streets, who served to remind one constantly of the horrid truth.

### Some of the Party.

Among those to arrive overnight were a quartette of Harley-Davidson sidecar outfits, one of which was piloted by W. Cooper, now engaged with the company, who will be remembered as the successful driver of Bradburys and Humberettes in the past. His passenger was Mr. Duncan Watson, the new London director of the Harley-Davidson depot. George Brough, of Nottingham, was also present, mounted upon a nearly new  $3\frac{1}{2}$  h.p. horizontal overhead valve twin Brough. Mr. Whiting, the Australian designer of the Whiting spring frame, was also there with his latest model fitted with a  $3\frac{1}{2}$  h.p. J.A.P. engine.

On the morrow, when about a score of riders and machines were assembled

in the hotel yard, the weather looked very threatening, although rain was not actually falling. The first move was to Rising Sun Hill, a mile or two outside Cheltenham; a start was made shortly after ten o'clock, the roads, in spite of some grease in places, being in nice condition. The hill itself, though extremely

rough, had a comparatively firm and dry surface. This hill has figured in a number of competitions in pre-war days, including the annual Colmore Cup Trial. It was at one time considered practically unclimbable, and in one or two of the earlier trials which included this hill, men with ropes were specially



W. Cooper, with Mr. Duncan Watson as passenger, approaching the steepest section of Rising Sun Hill on an 8 h.p. Harley-Davidson.



## LOOKING DOWN AND UP RISING SUN HILL.

A four-speed Whiting spring-frame machine making a good climb.

L. Newey (3 1/2 h.p. Ariel) tackling the steepest section.

stationed on the steepest portion to assist those who were so unfortunate as to fail. On the first occasion many competitors were glad of outside assistance. Of course, in all the official trials which included this hill, it was necessary to climb it with hot engines on the run. The difference that a hot engine makes is clearly demonstrated by the fact that on the present trip only two riders failed to make clean climbs of this 1 in 4 1/2 gradient at their first attempt.

## On Gambles Lane or Rising Sun.

The following were the performances on Rising Sun. The first two machines up were the 3 1/2 h.p. Ariel sidecars, driven by L. Newey and F. Neale, which came up in close order with their passengers sitting on the carriers. Newey made a

steady, clean ascent on his 15 to 1 gear, but his *confrère* was less lucky, as on striking the rough surface near the top the sidecar wheel lifted, and the machine came to rest in the ditch. At the second attempt, however, he made a clean ascent.

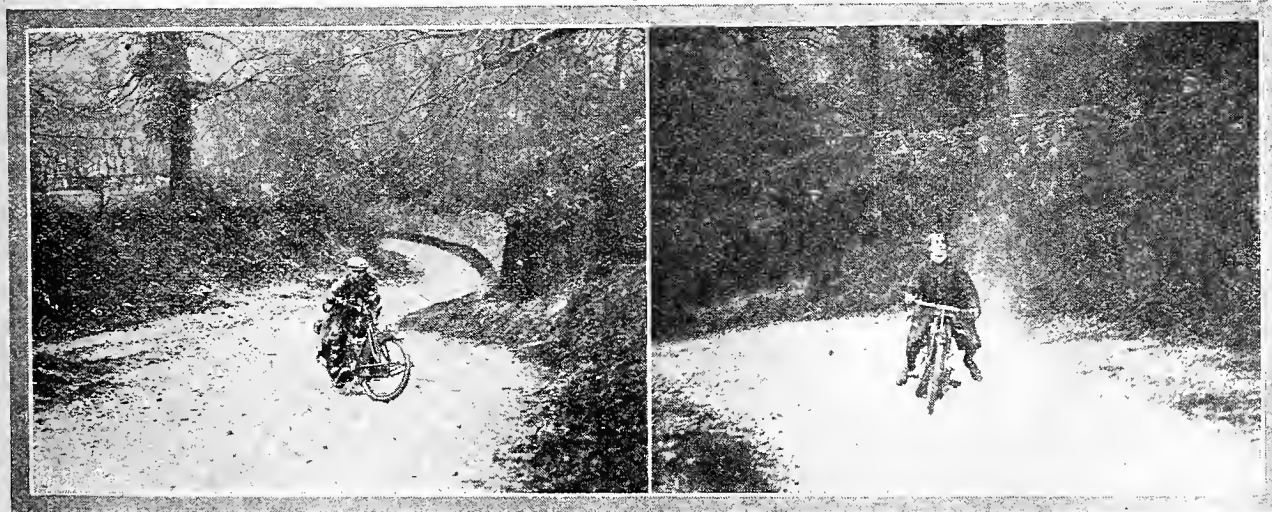
Watson (5-6 h.p. twin Ariel sc.) got up well, but with none too much in hand. W. Cooper was handling a brand new outfit; he had as passenger Mr. Duncan Watson. This mount, which was unpacked on Saturday morning, and, of course, had had no chance of being properly run in, accomplished one of the fastest climbs. The electrical model ridden by Mr. Henderson was very slow in comparison. Mr. Whiting came up very steadily, apparently on the second speed of his Jardine four-speed gear box, the

lowest ratio of which was 20 to 1. The good springing of the machine was noticeable on the rough surface near the top.

## A Fine Ascent.

A 2 1/2 h.p. New Imperial-Jap, ridden by E. Arch, was one of the unfortunates, and stopped within a few yards of the top, whilst the other New Imperial, ridden by Hardwright, got up comfortably. Undoubtedly the finest solo attempt was that of George Brough, who came up at a tremendous speed, and had to cut out several times; in spite of the rough surface Brough looked quite happy as usual. A similar machine, ridden by a private owner, came up very steadily.

A little O.K. showed up conspicuously,



## SCENES ON NAILSWORTH LADDER.

The spring-frame Whiting on the steepest section.  
This machine has a Jardine four-speed gear.

George Brough, who, as usual, made a star ascent on a 3 1/2 h.p. Brough. He is seen just recovering from a big skid.





W. W. Moore, on the new chain-driven 4 h.p. Douglas model described on page 133 of this issue, passing a stranded sidecar outfit on the steepest portion of Nailsworth Ladder. The gradient here is as much as 1 in 2 $\frac{1}{2}$ .

climbing steadily and surely with power in reserve. At about eleven o'clock a start was made for Nailsworth Ladder via Stroud. After the party had passed through Cheltenham rain began to fall, and the wet roads with a strong head wind combined to render the going both heavy and unpleasant.

#### The Performances on Nailsworth Ladder.

The Ladder is a formidable ascent rising out of Nailsworth village. The commencement is the "W" main road to Cirencester, but the *pièce de résistance* is a lane leading out of the main road at right angles with a gradient commencing at about 1 in 4; after a few yards this eases off, and a narrow lane with a good surface and a moderate gradient continues for some distance, till, on rounding a right-hand bend, one

is confronted with a rise which has a reputed gradient in places of 1 in 2 $\frac{1}{2}$ . The surface, although not loose, is extraordinarily rough, and has deep ruts in it. This steep portion continues in two sections, with a comparatively easier intermediate stretch of 100 yards, the total length of the lane from the steep main road being about 500 yards.

When the competitors arrived, the surface was already tacky, but before the first attempt was made rain came down heavily, and the none too good surface was rendered very bad indeed. Curiously enough, however, the failures frequently were not due directly to wheel spin. Of the sidecars, not one succeeded in making a clean ascent, though several plucky attempts were made. Of the solo riders, only two, viz., the irrepressible George Brough

and W. Cooper (who had detached his sidecar), succeeded in accomplishing the climb at the first attempt. Both these riders came up splendidly, steering a perfect course compared with the other riders. Neither, too, took his feet from the rests, despite the roughness of the road. The curious part of the climb is that these two machines were those with the highest gears. Brough's  $3\frac{1}{2}$  h.p. horizontal twin had a low gear as high as 8 to 1 (the writer checked this), while Cooper's Harley-Davidson was geared roughly 12 to 1, which with 28in. wheels equals a gear of 11.1 with 26in. wheels. Two other clean ascents at subsequent attempts have to be recorded, viz., by W. W. Moore on the experimental model all-chain drive 4 h.p. Douglas, described on another page of this issue. Moore's first climb was a most spectacular one, as he attempted to take the hill fast, with the result that he skidded all over the track, finally striking a large bank, which threw him high into the air and caused a fall.

#### Other Good Attempts.

The other clean ascent was made by Goodacre, also on a 4 h.p. Douglas, whose first two attempts were abortive owing to falls within a few yards of the top. He was not the only one to come to grief. Mr. Whiting was unable to make a clean ascent, in spite of his 20 to 1 gear, and, curiously enough, his best climb was when he used his third speed throughout. Wheel slip no doubt had something to do with this. Newey ( $3\frac{1}{2}$  h.p. Ariel sc.) made several plucky attempts, but was unable to get up without assistance. Watson (5-6 h.p. Ariel sc.) came up slowly with passenger on carrier, but, owing to front wheel skidding, he charged the bank and stopped. Cooper also made an attempt with sidecar and passenger, but failed owing to his high gear ratio. This hill proved a distinct triumph for the horizontally opposed twin. Three out of four clean ascents were achieved by this type of machine, which rather suggested the improved stability of this even firing twin.

It rained heavily the whole time the competitors were trying the hill. Among the lookers on were Mr. W. W. Douglas and Mr. S. L. Bailey.



SOME OF THE LESS FORTUNATE COMPETITORS WHO DID NOT GET UP THE HILL!

## LETTERS TO

## THE EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

## Decarbonisation.

Sir,—The correspondence that has taken place lately in *The Motor Cycle* regarding decarbonisation has given me rather a shock. Either I have been extraordinarily lucky, or else I am a sinner almost beyond pardon. Let me give my own experience with a 5-6 h.p. Ariel which I purchased in June, 1914. I have run this with a tandem Canoelet sidecar, and this forms a fairly heavy combination. My human load is usually at least thirty-one stone. I weigh thirteen and a half stone myself. At the New Year holidays this year I took off the cylinders for the first time since I bought it, although the engine was still running perfectly, having at that date completed over 5,000 miles. There was very little carbonised matter either on the top of the piston or in the head of the cylinder, while the piston rings were polished like silver, and were perfectly free in their grooves. Evidently I could have done many more hundreds of miles before decarbonisation was necessary.

I may say that I use neither Oilclag nor any cooling device, while, unlike Mr. Cohen, I cannot say that I can hold my bare hand on the cylinder when running. I use Huile de Luxe alone for oiling, and as I was entirely a novice when I bought the machine, I cannot claim that expert oiling has had any of the credit. A. S. ROBERTSON.

## Two-stroke Design.

Sir,—There are two points in the letter from Messrs. the Bordesley Engineering Co., Ltd., in last week's issue of *The Motor Cycle* to which we should like to reply.

Firstly, as far back as early 1914, our Mr. Newey made an experimental Levis engine equipped with a device which, though slightly different in construction, was identical in principle with that described by Mr. Martin in your issue of January 20th.

Secondly, while we admit that the Connaught horizontal twin was the first engine of this kind of which particulars were published in the press, this is not at all conclusive, and does not entitle its producers to designate it as "the signal for others to follow." The Levis horizontal twin was a practical proposition and was receiving exhaustive tests long before any particulars of the Connaught were published.

We may, perhaps, be pardoned for the suggestion that the Connaught horizontal twin was (shall we say?) premature. Nothing further than a press notice seems to have materialised, and the firm's latest V twin two engine machine is of totally different and rather extraordinarily novel design.

We need hardly say that the Levis horizontal twin is a proved success. The article on page 110 of the same issue of *The Motor Cycle* speaks for itself.

BUTTERFIELDS, LTD.

Sir,—I read with interest the article by Mr. J. Martin on the design for a two-stroke engine which appeared in your last issue. I have been much interested in the various faults of the engines of two-stroke lightweights for a considerable time now, and I hope you will allow me space in your valuable paper to explain a design which has occurred to me.

The chief cause of trouble in two-strokes is bad scavenging and the mixing of the incoming gas with the exhaust gases. To remedy this, why not do away with the carburettor altogether and draw pure air into the crank case instead of a mixture of petrol and air? Substitute for the carburettor a small force pump, and spray petrol into the cylinder from a small jet just as the piston is nearing the top of its stroke.

The air to form a mixture with this petrol would, of course, have been admitted from the crank case, just as the mixture is on the present type of two-stroke.

A variable compression could be arranged on the lines of Mr. Martin's design by a small mechanically operated release valve with a range of openings, say, from full to half compression, only it would not be necessary for the air to return to the crank case. Of course the release valve would need to close before the petrol was sprayed into the cylinder, but this could be arranged by properly timing the cams on the crankshaft.

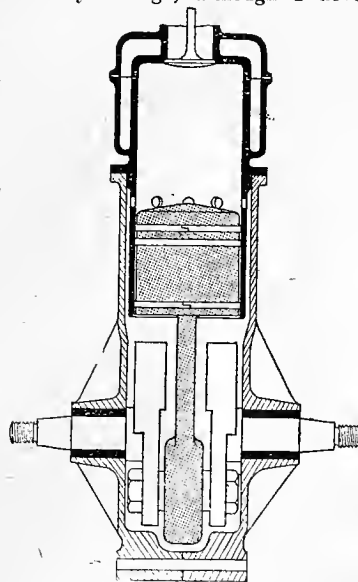
To vary the supply of petrol and the opening of the release valve, the actuating levers from the cams would be mounted on eccentric bushes, which, on being rotated, would cause the levers to fall away from, or drop nearer to, the cams, thus altering the lift of the valve, or the stroke of the pump, as the case may be.

The eccentrics would be controlled by Bowden wires, as in the case of a carburettor, the release valve corresponding to the extra air, and the pump to the throttle.

R. DUNSMORE.

Sir,—I beg to take exception to a point Mr. Martin raises in his article on two-stroke engines, viz., lack of flexibility. I am at present running a 2½ h.p. Villiers, and I find it more flexible than any four-stroke of equal power.

I think Mr. Martin is on the right track, and I give you herewith a description of an engine which I designed some years ago, although I never completed the engine.



\* Two-stroke engine designed by the writer of accompanying letter.

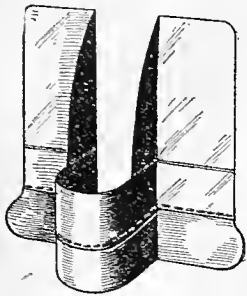
The inlet ports are a series of small holes of suitable area, slightly countersunk on either side, and are uncovered by the piston in the usual way. The main feature of the engine is the exhaust valve in the head of the cylinder, which is operated by a cam on the main shaft. The design called for a back pressure valve between the crank case and the carburettor, but this could be dispensed with as in a three-port engine.

I may say that I altered an old Fairbanks single-cylinder engine, and, although the conversion was carried out with scrap material mostly, the result was highly satisfactory. The above engine, I should add, was run at a constant speed of 850 r.p.m. It originally ran at 600 to 650, and went up 200 on the conversion, no alteration being made to the propeller, and the fuel consumption comparing very favourably with a four-stroke of reputable make. As you may readily understand, the exhaust valve gave some trouble through overheating.

TWO-STROKE.

### A Mudguarding Improvement.

Sir,—I herewith enclose you sketch of a very successful front mudguard attachment, which I have made for my machine out of an old biscuit tin at a total cost of 1s. 2d. My machine was very dirty in the matter of mud, but this attachment now allows me to run through any quantity of loose grease and dirt, and emerge with a clean appearance.



The sketch may explain itself. The bottom piece is a linoleum flange (costing 5½d.), attached to the 6in. strip of tin by copper wire (stitched). This 6in. strip has no joint in it, merely four right-angle bends. Soldered to this are the side flaps. I attached the contrivance by four bolts to the wings of my present mudguard; there is no rattle. I must add that the whole took a

beautiful black surface (including the linoleum, strange to say) from a small tin of Stovo (2½d.). With three coats the attachment looks like part of the makers' work.

FRED ROBERTS (Sec.-Lt.).

### Winnats Pass.

Sir,—I was interested in your photographs and article on climbing Winnats Pass, near Buxton, in Derbyshire, published in *The Motor Cycle* of January 27th.

For an 8 h.p. twin and sidecar to climb this hill is in no way a remarkable performance. I, with sixteen other despatch riders, was stationed at Buxton during the winter of 1914. We were mounted on Rudgets, Douglasses, and Zeniths, and climbed this hill on numerous occasions, and I think this a creditable performance for a Douglas. On some occasions the road, or perhaps I may say track, was frozen and covered two to three inches deep in snow.

I believe the pass is named Winnats Pass on account of the tremendous wind which blows down between the hills, and the climbing of the pass depends entirely on the wind. There are days when even the 8 h.p. Harley-Davidson would never climb it. I have myself been blown right off the track, machine and all, as soon as I turned the bottom corner.

J. B. BLAKEWAY, Cpl., R.E. Signals, B.E.F.

### Horse-power Formulæ.

Sir,—I am a constant reader of your valuable paper, but have so far not attempted to break into print. I am writing with regard to your interesting article, "Engine and Clutch Efficiency Test," which appeared some time ago. In this the pulling power and therefore the h.p. of the engine is measured. What I have never seen discussed in your paper is the relation of h.p. to throttle openings. Take a motor cycle rated at 5 h.p., which the manufacturers will probably tell one develops 10 h.p. on the bench test; revolutions usually not stated, but presumably about 2,500. This machine ridden solo will require a quarter to one-third throttle opening to attain thirty miles per hour on the level. If a sidecar is attached it will require about two-thirds opening to attain the same speed. Will not the h.p. developed be greater in the latter case than in the former, due to greater load and especially greater wind resistance?

If one used the formula  $\frac{D^2 \times S \times N \times (r.p.m.)}{200,000}$  (where D and S are in cms.), which I believe appeared in your paper, as a fairly accurate formula for calculating h.p. developed, the h.p. found will be the same in each case, as the formula is based on revolutions alone. This, of course, is impossible. Now what I think would be very interesting would be an article in your paper on this subject, showing how the friction and wind resistance of a sidecar machine at different speeds could be found, and from this the real h.p. developed could easily be ascertained. At higher speeds the wind resistance seems to be the chief retarding force, weight not mattering much on the level. How does wind resistance vary with the speed?

I hope that this letter will promote discussion in your correspondence columns, if you are good enough to publish it, as I would like to get a little light on the matter, having

so far found it impossible to know what the h.p. of my engine really is under various speeds and loads. H.P. [The formula which our correspondent quotes, commonly known as the Dendy-Marshall, is not intended to give the horse power actually being exerted at any and every road speed under varying conditions, but it is intended to indicate with a fair degree of accuracy the utmost horse power of which the engine is capable at different engine speeds, of course at full throttle. It is quite obvious that greater power is required to propel a machine up a steep hill at thirty miles per hour than to attain the same speed on the level where the weight has but little influence on the tractive effort. Road resistance may equal about 60 lb. per ton, therefore the weight of an extra passenger will mean that only about 4 lb. extra pull is required. Wind resistance, which varies as the square of the speed, while the h.p. required to overcome it varies as the cube of the speed, becomes a very powerful retarding force at high speeds. The 5 h.p. machine, referred to by our correspondent, running at thirty miles per hour on quarter throttle, would be exerting about 2 h.p., assuming the machine and rider to weigh, say, 360 lb. The same machine ascending a hill of 1 in 9, where possibly full throttle or nearly would be required at the same speed, would exert just over 5 h.p.—Ed.]

### A Prolific Cause of Engine Trouble especially in Two-stroke Engines.

Sir,—Having had reason to investigate some engine damage "due" (as every motor man is convinced) "to bad oil," your readers may be interested in the real cause. This has turned out in some cases to be due to the "petrol" method of lubrication, and in others to the mixing of heavier spirits and kerosenes with the petrol used. Both resulted in the same thing, viz.: gross dilution of the lubricating oil with the heavier constituents of the fuel. The oil was in each case reduced to a worthlessly thin compound incapable of standing either main bearing or connecting rod pressures, with the consequent result of worn big ends, knockings likened to a gang of riveters at work, dryness of pistons at the top end, and occasionally copious smoke from the exhaust.

In the case of "petrol" lubrication the petrol is not always all vaporised, the oil spray which wets the walls is thin and works down into the crank case. In the case of heavy fuel, unless special precaution is taken, or the inlet is sufficiently hot, a fractionation takes place, and the heavier and less volatile oil gets to the cylinder walls, washes them pretty free from lubricant, and finally dilutes the contents of the crank case. This is no fancy picture, as the amount of dilution of the lubricating oil has been found to be anything from 5% to 50%.

Another source of dilution of lubricant is the power a heavy oil has of absorbing and condensing some of the vapour and most of the spray taken into the crank case for compression on a two-stroke engine. It would be interesting if some of the possessors of knocking two-strokes would have the condition of the contents of the crank case investigated at the time of the trouble. OLEOFIEND.

### PUBLISHERS' ANNOUNCEMENT.

#### The Restricted Supply of Paper.

In view of the decision of the Government to limit the import of material for the manufacture of paper it is imperative that every possible step should be taken to avoid waste of paper in any form.

It has been the custom in the past for newsagents to order a certain number of papers for chance sales, and these copies if unsold become what are known as "returns"; in other words, waste copies.

In the case of "THE MOTOR CYCLE" the percentage of returned unsold copies has been remarkably low, but in order to conserve the supply of paper in future it is desirable that the waste of copies, ordered to accommodate occasional purchasers, shall as far as possible be eliminated.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in this matter by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

# COMMONSENSE ABOUT THE MOTOR.

IN the following article I do not propose to describe a complete motor cycle, or even to indicate a complete power unit, but only to show how many parts may be made of more suitable materials, and of a better shape for the duties they have to perform. The advantages of good design are most apparent in two of its results—long wear of each individual part without renewal (economy), and a reserve of power which may not often be required, but is to be drawn upon when unfavourable conditions call for it. This induces confidence and, therefore, enjoyment.

Power mainly depends on two principal factors—capacity and revolutions per minute. The former is decided once and for all by the maker, and is limited

by the necessity of keeping the weight (and size) of the complete machine down to a reasonable amount. The latter factor can only be obtained by scientific design from first principles, of every integral part of the proposed machine, and then the skilful combination of the separate parts, with the least amount of compromise that is humanly possible, into a harmonious whole.

When this is done conscientiously, and with entire disregard for precedent, I venture to prophesy that the result will be a revolution in motor cycle practice far greater than

has hitherto taken place from its first conception.

In my last article I mentioned some of the more obvious faults in the design of various parts of the present day machine, and I now propose to suggest improvements in their design.

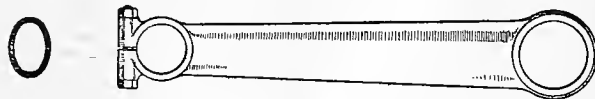
## Piston.

The piston is the most violently accelerated unit in the whole mechanism, and in consequence it is the most important part to lighten—not principally to obtain extra revolutions, as most writers plausibly, but erroneously, state, for the most massive piston can be balanced in the way adopted by the A.B.C., Douglas, etc., but to avoid unnecessary strain on bearings, connecting rod, and crank. As steel is probably the only material that will stand the high temperature and retain a sufficient portion of its strength, the piston should be made of it. I give a rough sketch of a working idea. It is in two pieces of rolled steel (not cast) riveted together. The hardened steel bushes for the gudgeon pin to work in are press fits in lugs welded to the piston skirt. I propose to use a steel cylinder, so if it should be found

that the steel faces of both cylinder and piston do not work together perfectly, a couple of iron bearing rings may be fitted on to the sides of the piston, and the top one, being wider than the other, may have a groove turned in it to hold the single ring, which should be sufficient to hold compression. In the event, however, of the steel to steel modifications being satisfactory, with the help of the special lubricating system I shall describe, the above complication may be dispensed with. The amount of bearing surface necessary on the side of the piston will also repay study. The amount given to standard pistons is certainly more than adequate. The gudgeon pin should be very large in diameter, even one-third of the piston diameter is not too much. It should be bored slightly taper from each end, so as to make it rather thicker in substance in the centre where it has to be fastened to the connecting rod.

## Connecting Rod.

This is subjected to a successive pulling, pushing, and bending force. What is the best known shape to resist this force? Undoubtedly a tube which has an elliptical cross-section whose major axis is parallel to the plane of the flywheel. The rod should be as short as possible, with due regard for side pressure on the cylinder walls. Here we have to take into account the amount of offset, if any, and that especially interesting problem, the stroke-bore ratio, which, however, is far too complex to discuss in a short article. It, however, must be decided upon before the design can be proceeded with. For numerous reasons I prefer a bore which is roughly one and a



Oval hollow connecting rod with split small end.

half times the stroke, which among other advantages, gives a short connecting rod and not much side strain. An offset of approximately one-sixth of the stroke will equalise the pressure on the front and back of the cylinder, and conduce to long life.

## Bearings.

A roller bearing is indispensable for the big end, as it is the most important in the engine, and takes more than twice the strain on each main bearing. It is most important that the little end bearing should be in the piston and not in the connecting rod. Here, for instance, are some of the reasons: (1.) It can be oiled from the cylinder walls. (2.) There is much more space for a long bearing (most important, as it undergoes only partial rotation, and practically wears only one side of the pin). (3.) No driving fit is



**Commonsense About the Motor.—**

required in the piston to keep the ends of the pin from scoring the cylinder walls, also distortion of the piston is avoided. (4.) It can be easily removed without the aid of punches or presses. The main bearings are in a rather inconvenient position to lubricate by splash, so roller bearings should be used instead of plain bushes. These bearings should also be provided with compression spring washers as in the Scott.

**Crankshaft.**

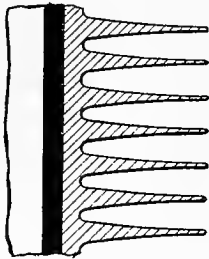
This should be made as sturdy as possible. No disadvantage can accrue from rigidity, and all parts of it can be balanced. Two joints would be advisable to facilitate fitting the big end bearings.

**Crank Case.**

This is one of the few parts of the power unit, which, being a framework, can be properly constructed of cast iron. This need not weigh any more than the usual one of aluminium, for owing to the outside fly-wheel, it may be made considerably smaller. It would have no tendency to strip any threads formed in it, which may so easily happen in aluminium.

**Cylinder.**

This should be made of plain steel tubing, with a separate combustion head of cast iron, held down with long bolts. A cast aluminium casing, with very deep fins for radiating the heat away, should be shrunk on to the cylinder, which after repeated heatings is lapped to size, to prevent subsequent distortion. These aluminium fins should not have parallel sides, but should be thicker at the base than the tip. More aluminium fins could be securely fastened with good metallic contact to small machined fins on the combustion head.



Aluminium casing with deep fins shrunk on to cylinder.

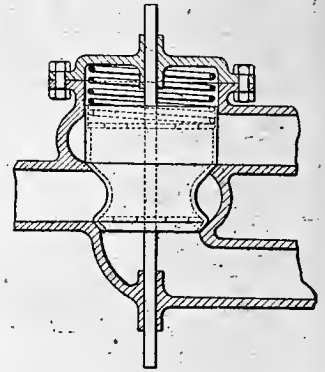
**Valves.**

For valves I have in mind a modification of the De Lissa type, two-seated and balanced, but using *both* seats for the passage of gas. They are hollow and have a complete air way through the centre. The valve stem is central, and passes through two plates in the valve, one near the middle and one at the top. These are pierced with several holes to facilitate cooling. The valve stem acts as a guide to the valve, and is supported at each end. The spring is adjustable in tension, and bears directly on the top plate of the valve. These valves are placed at the top of the combustion chamber, and work horizontally. The camshaft should be placed as near the valves as possible, and directly geared by an enclosed chain. The cams, which are of the external type, should be very large in diameter, so that a sudden lift may be given to the valves without causing an undue strain on the tappet mechanism. Tappet fingers are employed to bear upon the cams with large rollers to eliminate friction, and very small and light adjustable tappets should be fitted to regulate the clearance. The gear box, holding the cams, being separate from the

crank case, could be lubricated with a suitable oil, which is at present not possible. For T.T. and racing engines the cams could be made with a double face, so that the valves are mechanically closed, a stout buffer spring being interposed to avoid damage to seats, etc. With this type of valve the available area of opening could be easily made equal to one-half the area of piston without using freak proportions.

**A Specification.**

For the whole engine I suggest that the following specification would be well-nigh perfect: Twin opposed cylinders, offset (perfect balance and even firing periods); magneto, with control on driving-shaft (maximum spark at all positions



Double-seated exhaust valve, showing bridge at top permitting ingress of air.

of advance); two plugs at least in each cylinder. There is no extra expense, and improved results are obtained at high revolutions. Lubrication as follows: Forced feed, with visible drip from a sump to both sides of cylinder walls, with entries so placed that the little end bearings get a copious supply. The waste oil from the cylinders drains into a large trough at the bottom of the crank case, from which the big ends splash it into the main bearings, becoming lubricated themselves whilst doing so. The oil is kept at a constant level by means of overflow holes, which drain it into the sump again. The carburetter, in addition to a throttle, has the more important adjustments of jet and choke tube, all three controlled from the handle-bars. The exhaust pipes should be rather long and without any pronounced bends. The silencer (one is sufficient) should be at the extremities of the exhaust pipes, and create very little back pressure. With the scavenging action of the long pipes a modified timing may be used to advantage. The flywheel is outside, and of large diameter and symmetrical section, built of steel, and with most of its mass concentrated in the rim. It should be capable of standing the most violent acceleration and the highest revolutions without any fear of fracture. A large non-return valve should be fitted to the crank case. This would minimise the loss of power due to pumping the air in and out, and ensure that no oil leaks through joints or bearings.

Features of the complete machine—first and most important, the frame must be quite rigid, both vertically and laterally. This means that the frame must be double from the back hub to the head, also every tube must be perfectly straight, and as far as possible the frame must be triangulated. The engine should not be allowed to form a connecting link in the frame. Both wheels must be sprung. The front wheel should be able to take any shocks in the plane of progression; the back wheel is only trailed when

**Commonsense About the Motor.—**

the vehicle is moving, so that a simple up and down movement would suffice. I have a great *penchant* for an infinitely variable gear, together with shaft drive. This could be made possible by means of a friction device, giving gears whose ratio is at least 1—6. The shaft drive should incorporate a spring drive, as a slipping clutch device wastes power. The shaft itself could be deeply fluted, or a spring connection could be inserted. This would be the better way, as the up and down movement of the back wheel

would be allowed for. The saddle should be very low and brought well forward. The handle-bars should be fairly wide, the steering column bisecting the straight line joining the grips.

I could say a great deal more about weather-proof fittings, control levers, tank capacity, steering rake, point of road contact, etc., but this article would be drawn out to an unreasonable length, so I will trust the assiduous reader of "Ixon's" weekly causerie to supply mentally the necessary refinements.

A. WORSDALE.

## Common Queries and their Solution.

**W**E offer no apologies to our readers for giving prominence to answers to some of the queries most frequently received at this office.

### The Local Taxation Licence (£1).

This is not transferable. It enables a man to keep one motor bicycle from the time the licence is taken out until December 31st of that year. If a man sells his first mount and purchases a second one the same local taxation licence will do. After October 1st it may be had for half fees, *i.e.*, 10s.

Sidecarriers used and adapted for trade purposes and on which the owner's name and address are painted in letters not less than one inch in height are exempt, but if the carrier be at any time removed and the machine used privately the owner becomes at once liable for the tax.

A machine permanently laid up for one year does not need to have a licence taken out in respect of it; if used on any single occasion the licence duty must be paid.

### How to Time an Engine.

**FOUR-STROKE. VALVES.**—Set the exhaust valve to close just after the completion of the exhaust stroke. It will then commence to open when the piston is about one-seventh of the length of the stroke from the bottom of the firing stroke. The inlet should commence to open as the exhaust closes and remain open for one complete stroke of the piston or while the flywheels turn through 180°.

**MAGNETO.**—Place the piston exactly on the top of the compression stroke and connect up the magneto with the points just about to break and the ignition lever two-thirds retarded. This will mean that the explosion when ignition is fully retarded will take place when the piston has travelled about 1.5 mm. down the firing stroke.

**TWO-STROKE. MAGNETO.**—Place the piston on the top of the compression stroke and connect up the magneto with the points just broken and the ignition lever fully retarded.

### A Cut-out Magneto Switch.

A magneto switch is not injurious to the magneto as some readers

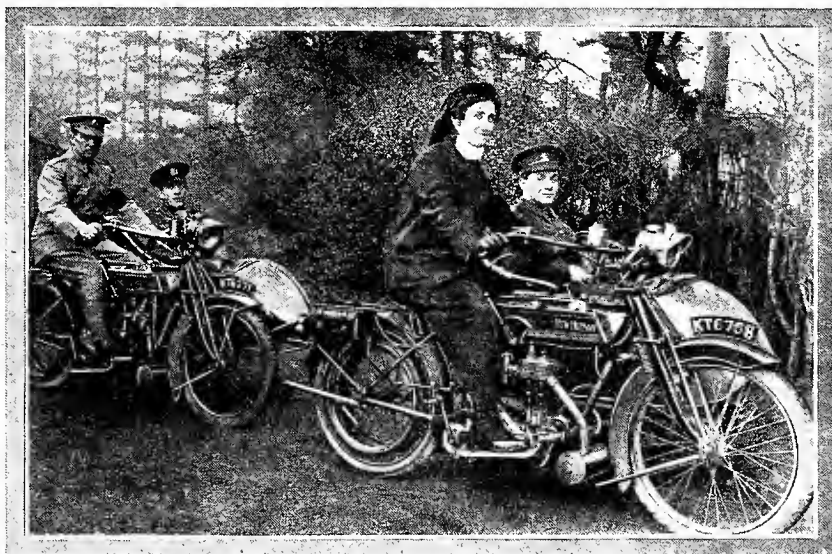
seem to suppose. To connect it up, it is only necessary to bring a wire from a handle-bar switch to a terminal on the magneto contact breaker. If the contact breaker is not provided with a switch terminal, one should be purchased which is so fitted.

**WHICH WHEEL OF A THREE OR FOUR-WHEELED VEHICLE HAS A TENDENCY TO LIFT WHEN TURNING A CORNER?**—The answer is: The inside one.

### Sparking Plugs.

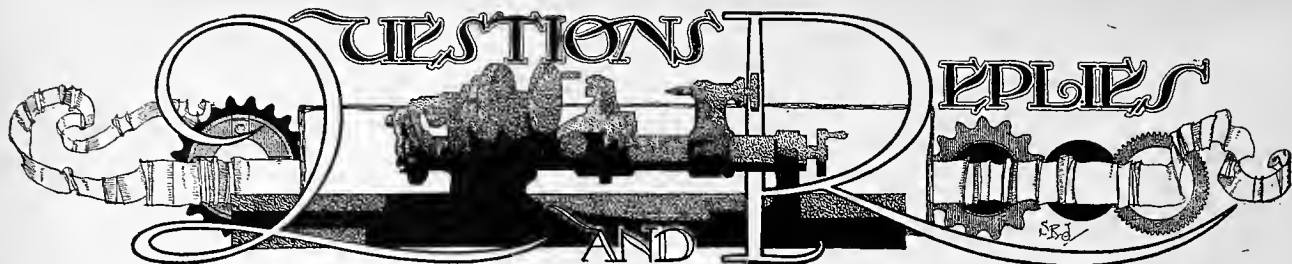
Some readers seem to suppose that a single-point plug is only suitable for a single-cylinder engine. This is not so; they are suitable for any type of engine.

Single-point plugs are becoming increasingly popular for two-strokes, especially for those of the air-cooled variety. This is due to the fact that the electrodes are usually much more substantial, and so are not so liable to become incandescent and cause pre-ignition. The spark occurring always at the same point tends to keep the electrodes free from oil. Multi-point plugs do not spark simultaneously at each point; the spark jumps one gap at a time, *viz.*, the one offering least resistance.



SIDECAR RUNS FOR WOUNDED SOLDIERS.

Nurse Bengé, a very popular army massage nurse at Maidstone, takes a convalescent soldier for a run on her New Hudson. The outfit of the same make in the rear is doing similarly good work, and is driven by Mr. Jordan, of the Maidstone Volunteer Training Corps.



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Timing a Two-stroke.

?

I have a  $2\frac{1}{2}$  h.p. two-stroke machine, and I have broken the magneto chain. Will you please let me know the correct method of timing the magneto. Shall I have to fit the chain before or after timing?—B.R.H.

You will probably find that the sprocket on the magneto is held in position by a nut, the sprocket fitting on the end of the cone-shaped spindle by friction. Put the chain on the sprocket, undo the nut, and have the sprocket loose on the end of the shaft. You had better get someone to stand on the other side of the machine and watch the magneto points. Make sure that the piston is at the top of the stroke, fully retard the spark, and have the contact breaker placed in such a position that the points have just broken. Then lock the sprocket in position.

### Removing Tar Stains.

?

(1.) How can I remove tar, picked up from a freshly repaired road, from a coachbuilt sidecar without damaging the paint? (2.) Will the same method apply to black enamel? (3.) After a fast run of from fifty to sixty miles my back tyre, rim, pulley (near side only), and belt were smothered in grease, which appears to have leaked through somewhere between pulley and chain case, but how it got on the rear wheel rim, unless carried along the belt and then thrown off, I do not quite understand. I oiled fairly frequently to be on the right side. I should naturally like to cure this. Do you suppose I gave too much oil? (4.) Would painting the tyres preserve them in spite of grease? (5.) Is there anything on the market with which one can treat a motor bicycle to prevent rusting entirely?—S.L.G.C.

(1.) Tar is best attacked at once if it is on the coachwork. If left a couple of days it is difficult to remove. One of the best methods is to rub it off with a soft cloth and plenty of butter or lard. Chemico or some similar car polish may help you in this respect. This is obtainable from any motor agent. (2.) This advice also applies and is equally good for black enamel. (3.) This trouble is probably due to the bearings being slightly worn, allowing an excessive amount of oil to come out and get on the belt,

which carries it to the rear wheel. A faulty crank case release valve might also cause the oil to be blown out in this manner. (4.) Painting the tyres preserves them to a slight extent. (5.) All you can do is to smear the bright parts with grease and not clean them during the wet weather. There are several treatments of metals to prevent rust, but these have to be carried out before completion by the manufacturers. Several transparent lacquers are sold for preserving bright parts from rust.

### Fitting a Drip-feed Lubricator.

?

As a novice, I am writing to ask your advice on the following: My first mount—a 2 h.p. lightweight—is fitted with a pump, but I am desirous of having fitted an automatic or semi-automatic lubricator. (1.) Is the crank case suction sufficient for the first named, of course retaining the ordinary hand pump, or, if the semi-automatic, what type and make would you advise, efficiency and ease of operation being considered first? Should I have any difficulty in getting either fitted? (2.) What is the best plan to pursue with valve caps that refuse to be shifted? (3.) The carburetter which is fitted to my machine has no tickler for flooding the float chamber. Is this usual on lightweight carburetters of the older type? As it stands at present, it is a little difficult to get a good body of petrol into the float chamber quickly enough to ensure an easy start. The position of the usual tickler is covered by a cap. Could I have one fitted?—NOVICE.

(1.) Many of these lubricators are intended to work through crank case suction; there should be no difficulty in having one of them fitted. (2.) The best plan is to put a large spanner on to the valve cap, having first soaked this in paraffin overnight, and give it a few sharp taps with a hammer. Very few valve caps will resist this treatment, especially if the engine is run for a few seconds just to warm up the cylinder. (3.) In this case the best plan is to take the needle between the finger and thumb and lift it up. This will have the effect of flooding the carburetter. Of course, the cap has first of all to be removed. It is hardly necessary to have a float agitator fitted.

### Difficult Starting.

?

(1.) My 6 h.p. twin sidecar gives me a deal of trouble in starting, though I apparently follow the instructions issued by the company. (2.) What is the cause of so much backfiring when starting in free engine? The machine suffered serious damage through the carburetter catching alight on the occasion of a backfire. (3.) Is there an electrical starter on the market for motor cycles?—W.B.H.

(1.) The trouble is most likely to be due to too weak a mixture at slow speeds. Fitting a larger jet might cure the trouble. Also be sure that there are no air leaks at the carburetter or induction pipe unions. (2.) The cause of it catching fire was most probably that petrol was leaking somewhere, and was ignited when the popping back occurred. You could do a good deal by carefully examining the inlet valves and seeing that they are working freely in their guides, also that the springs are strong enough and that the valves close properly. (3.) Electric starters have been made for motor cycle engines, but were found to be too complicated to be practicable.

### Renewing a Big End.

?

(1.) I wish to renew the big end bush in my 1912  $3\frac{1}{4}$  h.p. Premier motor cycle, but I am unable to remove one of the flywheels to get at it. Are these flywheels pressed on, and can they be removed with the average tackle? Of course, it is understood that the grub screw is removed? (2.) On taking the engine down the valve side half of the crank case refused to come away from the crankshaft with the flywheels in position. Is it necessary to remove the flywheels to take this part of the crank case away?—B.B.T.

(1.) The flywheels are usually merely a driving fit on taper shafts, so there should be no difficulty in removing them by tapping the ends of the crank pin with a hammer, having previously placed a piece of brass or copper between. (2.) The valve side half of the crank case can be removed without disturbing the flywheels, but in order to do this it will be necessary for the small timing wheel to be removed. This is keyed on to the engine shaft, and has a locking screw with a left-hand thread.

**SPECIAL NOTICE.**—Copies of "The Motor Cycle" may only be sent to neutral European countries if posted direct from the offices of the publishers, or by newsgagents who have obtained permission from the War Office for this purpose. The publishers of "The Motor Cycle" have obtained the necessary permission, and, consequently, can send subscribers' copies as usual. Before sending through newsgagents it is important to enquire if permission has been obtained, as otherwise copies intended for neutral European countries will not be forwarded by the Post Office.

**Loss of Power.**

?

I should be much obliged if you could tell me what is wrong with my 1914 2½ h.p. two-stroke. On the stand it runs splendidly, two-stroking evenly at the lowest speeds. When on the road, however, it takes a long time to pick up, whatever the position of the air and throttle levers, and refuses to take the slightest hill. I am certain the timing is correct, and I have carefully made all joints with gold size and tested them. I have removed all carbon deposit and the rings are both free. The compression is not very good. I can hear a slight hissing past the rings on both the up and down stroke of the piston when turned over slowly. On disconnecting the oil pipe there is a slight escape of mixture on the crank case compression stroke from the points where the oil enters the bottom of the cylinder on the left-hand side of the machine and the bearing on the crank case behind the timing wheel, but it does not blow oil back into the drip feed when the pipe is connected. After leaving the machine for a short time I find a few drops of oil on the ground under the crank case which appears to have leaked through the main bearing on the timing wheel side, but I can trace no leakage of mixture from these. Do you think that reboring the cylinder and fitting a new piston and rings would improve matters? The release valve seating which screws into the cylinder head is stuck tight, and consequently I have to remove the cylinder to grind in the valve. What is the best way to remove the valve seating?—L.P.

The most likely cause of your trouble is faulty piston rings; it is, therefore, quite possible that the new rings properly fitted would be all that is necessary. If, however, the compression still leaks past them after they have been run in, say, 200 miles, it would probably be better to have the cylinder rebored and a new

piston fitted. To obtain good results with a two-stroke all likelihood of leakage of crank case compression, either through the crank case joints *via* a broken oil pipe or worn bearing, should be overcome. As oil drips out of your engine while standing, it is possible that the trouble is caused by leaky joints in the crank case. We should recommend you to soak the valve seating in paraffin and then attempt to remove it with a large fixed spanner when the engine is hot. If necessary, give several short, sharp taps with a hammer.

**EXPERIENCES WANTED.**

Readers desirous of obtaining the experience of others with various motor cycles or accessories must enclose a stamped addressed envelope in which the replies may be forwarded. Answers to the queries should be addressed c/o The Editor.

"G.K.F." (Glasgow).—Grado multi-pulley.

"J.E.K." (Surrey).—Coventry Eagle. Consumption, general efficiency, and speed.

"J.N." (Hamilton).—4 h.p. Norton. Reliability, speed, hill-climbing, and consumption.

"F.S." (Herts.).—4 h.p. Norton and 3½ h.p. Sunbeam. Gears, flexibility, durability, speed, and petrol consumption.

"W.K.M." (Sheffield).—T.D.C. de luxe (two-speed gear). Reliability, hill-climbing, consumption, control, and ease of starting.

"H.A.B." (Coventry).—Binks carburetter for Scott. Consumption, flexibility, and acceleration. Also Binks special fuel.

**READER'S REPLY.****Noise in Engine.**

I notice under your Questions and Replies in your issue of January 20th a query initialled "D.C.B." Now, I bought a new 2½ h.p. two-stroke twelve months ago, and after running it 200 miles without any trouble, I was stranded one day three miles from home.

The engine suddenly stopped, and I could not get any spark at all, so was compelled to push the cycle home. I took it to an expert local dealer and repairer, and his solution was as follows: The sprocket wheel which drives the magneto was fastened to a tapered arm (not keyed), and had been tapped on tight after the engine had been timed; no screw could be found loose in the chain case, and he came to the conclusion that this had been missed by the makers and a screw had not been put in at all. The sprocket wheel had worked loose and the timing was disorganised. The repairer retimed the engine, but found when the machine was running a very bad grating noise and knocking occurred. His opinion was that the crankshaft had been bent through a heavy backfire when the timing went wrong, and advised me to send the machine back to the makers, as I had only had it six weeks, and their guarantee covered faulty workmanship. I took it to the makers' local depot and they forwarded it to their factory. They admitted that the crankshaft was bent, but would not admit having left the screw out of the magneto sprocket wheel. All they would say was that the trouble was caused through "faulty driving," and I would have to pay £2 5s. for the repair.—W.W.

**RECOMMENDED ROUTES.****WOOLWICH TO MARLBOROUGH.—J.S.**

Woolwich, Eltham, Catford, Forest Hill, Dulwich Common, Christchurch Road, Clapham Common, Wandsworth, Upper Richmond Road, Railway Hotel, Barnes, Mortlake, Richmond, Fulwell Park, Hounslow, Bath Road, Colnbrook, Slough, Maidenhead, Reading, Hungerford, Marlborough. Approximately 90 miles.

**SUDBURY TO ABERYSTWYTH.—C.F.H.**

Sudbury, Haverhill, Cambridge, St. Neots, Bedford, Newport Pagnell, Buckingham, Deddington, Chipping Norton, Stow-on-the-Wold, Tewkesbury, Ledbury, Hereford, Hay, Builth Wells, Rhayader, Llangurig, Dyffryn Castell, Aberystwyth. A reader recommends the route outlined above as between Ledbury and Rhayader to that given in our issue of September 9th, 1915, *i.e.*, *via* Willersey and New Radnor. The latter is preferable on the return journey.

**EVESHAM TO THE LAKE DISTRICT.—AB 3764.**

Evesham, Worcester, Hartlebury, Kidderminster, Bridgnorth, Wellington, Crudington, Hodnet, Whitchurch, Beeston Castle and Tarporley Station, Four Lane Ends, Eaton, Colebrook, Stretton, Warrington, Hulme, Newton, Wigan, Standish, Preston, Lancaster, Carnforth, Kendal, Windermere, Ambleside.

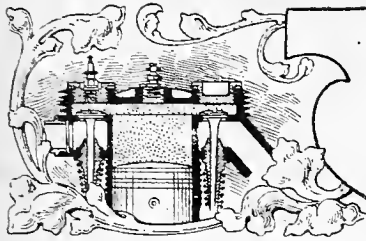
**EVESHAM TO LEYBURN (YORKS.) *via* Matlock and avoiding large towns.—AB 3764.**

Evesham, Stratford, Warwick, Kenilworth, Stonebridge, Coleshill, Tamworth, Ashby-de-la-Zouch, Derby, Belper, Matlock, Chesterfield, Staveley, Worksop, Tickhill, Doncaster, Aberford, Wetherby, Boroughbridge, Ripon, Masham, Leyburn.

**DESPATCH RIDERS IN A JOYFUL VEIN.**

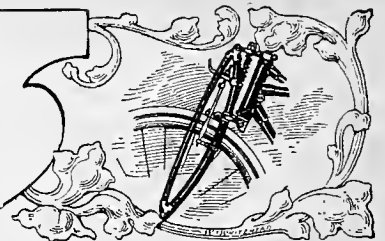
A photograph, taken on Salisbury Plain, showing R.E. despatch riders overhauling their machines and, incidentally, enjoying themselves. The men are, from left to right: Sgt. Pearson, Art.-Cpl. Badler, and Cpls. Ellis and Young.





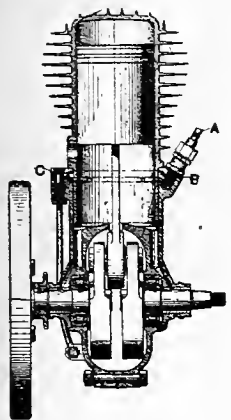
# PATENTS.

Abridged by ERIC W. WALFORD.



## Two-stroke Engine Lubrication.

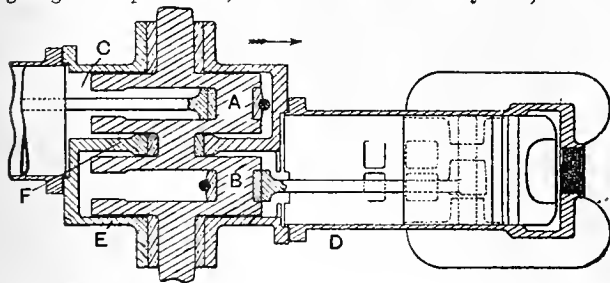
Oil is being supplied from a drip feed device by means of a tube A to an annular chamber which surrounds the cylinder wall at a point below the lower edge of the piston when the latter is at the top of the stroke. Holes are drilled in the cylinder wall to allow the oil from the chamber B to lubricate the piston, but the oil cannot flow from the tube A into the hole nearest thereto, as there is provided on the inner side of the annular chamber a wall C. The consequence is that the entering oil has first to travel the whole way round the cylinder before it can overflow this wall and pass through the holes in the cylinder wall. This ensures equal distribution of the oil. Another point is that the oil holes are exposed to the suction in the crank chamber when the piston is near the top of the stroke, so that the lubricant is sucked into the cylinder. These two features are claimed to enable drip feed lubrication to be used.—G. H. Hemingway and the Coventry Acme Motor Co., Ltd., No. 5,064, 1915.



it can overflow this wall and pass through the holes in the cylinder wall. This ensures equal distribution of the oil. Another point is that the oil holes are exposed to the suction in the crank chamber when the piston is near the top of the stroke, so that the lubricant is sucked into the cylinder. These two features are claimed to enable drip feed lubrication to be used.—G. H. Hemingway and the Coventry Acme Motor Co., Ltd., No. 5,064, 1915.

## A Twin Two-stroke Engine.

The engine illustrated has horizontally opposed cylinders, and is designed to give even firing, the chief feature of novelty being the construction of the crank chamber, whereby it is divided into two gight compartments, at the same time

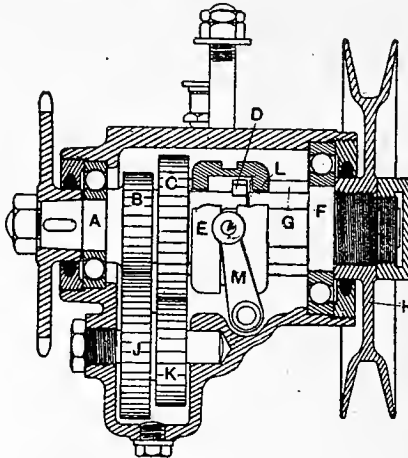


affording a central bearing for the crankshaft. This shaft is formed with two distinct cranks AB, to which are connected the usual rods CD, operating in cylinders of the usual type. The crank case is formed in two halves E, of which one is shown separate in the smaller view,

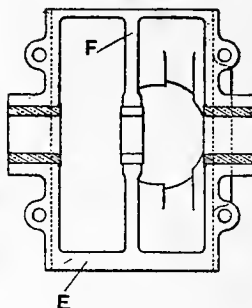
and each half is formed with a web F. This web F and the side walls of the crank chamber each carry one half of a split bearing for the crankshaft, and the crank case halves are bolted together after the crankshaft is put into place. The chief merit of the opposed twin—its good balance—is lost.—W. A. L. and R. Spencer, No. 21,748, 1914

## A Two-speed Gear Box.

Upon the main shaft A are mounted spur gears B and C, the former of which is fixed upon the shaft, whilst the latter is normally free to rotate independently. Beyond the gear C the shaft is enlarged and formed with clutch dogs D. The gear wheel C has similar dogs E, whilst



on the opposite end of the shaft is a sleeve F, which is formed with long clutch dogs G, and at its outer end carries the belt pulley H. The spur gears B and C engage gears JK on a short layshaft, and the latter gears always

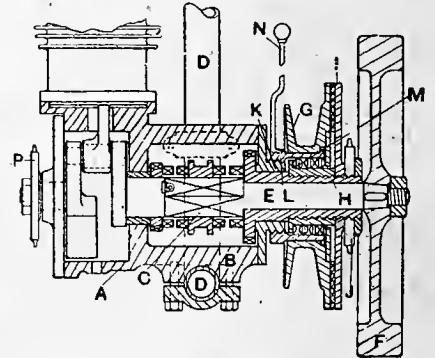


rotate together. Mounted around the enlarged part of the shaft A is a clutch sleeve L, formed with a groove to receive the operating lever M. The side walls of the sleeve L are formed as dog clutches, which may engage either dogs D, E, and always engage the dogs G owing to their

length. In the position shown the gear wheel C is locked to the driven sleeve E, and the drive is, therefore, through the gears B, J, K, and C, affording a gear reduction. On moving the clutch sleeve L to disengage the gear C and engage the dogs D the main shaft is coupled to the driven sleeve, and the drive is direct, the spur gears running idly. In the intermediate stage a neutral position is afforded, and the specification describes a modified arrangement in which the driving and driven elements are both arranged on the same side of the gear box.—E. Jardine, E. Watchorn, and J. Archer, No. 21,109, 1914.

## An Engine, Gear, and Clutch Unit.

Integral with the engine crank chamber casting A is a tubular extension B, which may form the housing for a simple two or three-speed gear C, and is attached by clamps to a frame tube D. The engine may be of any type desired, and its shaft is extended at E, and at its end carries a flywheel F, which may be the only flywheel or may supplement ordinary flywheels in the crank chamber. The driven spur gear of the change-speed mechanism is formed with a sleeve H, on



which are fixed a clutch plate I and a starting sprocket J. On the end plate of the gear housing is a screwed boss K, on which is mounted a sleeve L, around which is carried the belt pulley G. One flange of the belt pulley is adjacent to the clutch plate I, and one of the faces is lined with some clutch lining material. The pulley face is normally pressed up against the clutch plate by a spring arranged in the recess M, but may be withdrawn therefrom by actuating the sleeve L by means of the lever N, when a free engine effect is required. The magneto driving sprocket is shown at P. It will be seen that the whole mechanism is more or less balanced on each side of its securing clamps, and the whole unit is removable by undoing a very small number of fastenings.—H. S. Griesbach, No. 1,359, 1915.

## MOTOR CYCLES FOR SALE.

## Arno.

**SMART** Combination, 1914 3 1/2 h.p. Arno, 3-speed, cane sidecar, well upholstered, lamp, horn, Senspray; 38 gas.-Railway Garage, Staines. [9834]

## Arrow.

**1915** 4 h.p. Arrow-Jap, coachbuilt combination, 4-speed, Jardine countershaft, kick start, Bosch, Amac, Dunlop tyres, and belt, Lycett's La Grand Miller lamp, horn, mirror, etc., new August, run 60 miles, insured; 60 gas.-52, Mill Lane, Macclesfield. [9758]

## Auto-Wheels.

**UTO-WHEEL**, perfect condition; £8.-Harry's, Market Place, Romford. [9769]

**UTO-WHEEL**, B.S.A., almost new; £10.-Wauchope's, 9, Shoe Lane, London. [X1622]

**UTO-WHEEL**, run 300 miles, perfect condition; £10.-Dallyn, Landkey, Barnstaple. [X1333]

**UTO-WHEEL** de Luxe, £15/15, or 26/3 monthly; second-hand standard model, £10.-248, Bishopsgate, London. [9807]

**UTO-WHEEL**, complete, fit any cycle; cost £13, take £13; nearly new.-Oakfield, Solihull Rd., Shirley, Birmingham. [9529]

**UTO-WHEEL**, new condition, guaranteed perfect, all accessories; genuine bargain, £10, or nearest offer.-Westgate, St. George's Av., Wollstanton, Staffs. [X1062]

## Bat.

**BAT-J.A.P.**, 4 h.p., Mabon, free engine, spring frame, engine overhauled by makers; £18/10.-Sibley, 72, South St., Romford. [9767]

**BAT-J.A.P.**, 1912, 8 h.p., free engine, splendid condition, smart appearance, recently enamelled and plated; £26; genuine.-Cater, St. Cloud, Amersham. [9596]

**1915** 8 h.p. Spring Frame Bat, and spring wheel Bat sidecar, 2 luggage grids, 3-speed gear, clutch, kick starter, 2 pairs handles, new last Easter, only used weekends, exceptionally well looked after, almost pass for new, one of the smartest outfits on the road, guaranteed faultless; £75.-Hucklebridge, 133, Sloane St., S.W. [9601]

## Bradbury.

**BRADBURY** 1916 Models.-Agents, Bright and Hayles, 73, Church St., Camberwell, London. [9652]

**BRADBURY**, 4 h.p., 1912, 2-speed, etc.; £25.-Colmore Depot, 31, Colmore Row, Birmingham. [9845]

**BRADBURY**, 1913 1/2, 4 h.p., 2-speed countershaft, kick, good condition, 32 gas.; Canoelet, £6/15.-20, Beauchamp Rd., Clapham Junction. [9694]

**BRADBURY** Motor Cycle, 4 h.p., fixed gear, new wheels, tyres, undeguard, handle-bars, capital machine; £22.-John Henry Moss, 50, Ansthorpe Rd., Cross Gates, Leeds. [X1648]

**BRADBURY**, 1914, 2-speed, chain drive, and splendid sidecar, accessories, also tradesman's box to take place of body; £42/10; seen by appointment.-Bristow, 23, Bickersteth Rd., Tooting. [9609]

**BRADBURY** 1914 1/2, 6 h.p. C.B. Combination, 3-speed, countershaft, kick start, clutch, enclosed chain drive, new Druid II, spring forks, lamps, horn, new cycle car tyre, not done 2,000 miles; £60.-Heywood, 11, Library St., Wigan. [X1505]

**BRADBURY**, 1914, 6 h.p., 3-speed countershaft gear, aluminium chain cases, coachbuilt sidecar, complete combination listed new at £91, fitted with lamps and mechanical horn, new 3 in. Pedley back tyre, new Dunlop r.s. front tyre; a bargain, £51.-The Premier Motor Co., Aston Rd., Birmingham. [9854]

## B.S.A.

**B.S.A.**, new 4 1/2 h.p. model K, prompt deliveries given by Slack's Garage, Stockport. [X1454]

**CONSULT** Rex Mundy before purchasing a new or second-hand B.S.A.-See "Consulting Engineers" column. [9506]

**1916** B.S.A., model H, delivered January 28th; too late for owner; £60.-4, Cranley Mews, South Kensington. [9786]

**B.S.A.**, 1913 1/2, double-seated sidecar, chain drive, 2 speeds, free engine, lamps, spares; £45.-Bugs, 80, Wolfington Rd., West Norwood. [9831]

**B.S.A.**, 1915 1/2, and new sidecar, splendid tyres and accessories; owner enlited; accept £30, complete.-Mason, Old Manor, Hereford. [X1459]

**B.S.A.**, Latest 1916 Models.-Immediate delivery from stock at the Colmore Depot's London Agency, 44, Finsbury Pavement, E.C. [9792]

**1916** B.S.A., 4 1/2 h.p., model K, £62; three in stock; Canoelet model B3 sidecars in stock to suit.-D. J. Shepherd and Co., Enfield Highway. [9804]

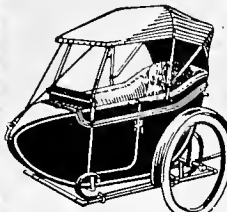
**B.S.A.**, model H, 3-speed, all chain drive, £64; also B.S.A. No. 2 sidecar, £18/18, just arrived.-Hucklebridge, 133, Sloane St., London, S.W. [X0942]

**1915 1/2** B.S.A., chain-cum-belt, 3-speed countershaft, Millford coachbuilt sidecar, unspratched, accessories; call any time; £65.-77, Hammersmith Rd., W. [9779]

**1913** 3 1/2 h.p. B.S.A., 2 speeds, and free engine, all chain drive, countershaft, kick starter, in very nice condition; £29.-Wallis, 49, High St., Saffron Walden, Essex. [X1516]

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2 1/2 h.p. **LEVIS**, 1915, 2-stroke, 2-speed ..... £28 15  
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3 1/2 h.p. **PRECISION**, 1912, nice condition ..... £16 15  
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3 1/2 h.p. **RUDGE**, 1912, free-engine model ..... £19 15  
4 h.p. **QUADRANT**, 1912, 3-speed model ..... £20 15  
3 h.p. **SINGER**, 1912, 3-speed model, with cane Sidecar ..... £25 0  
3 1/2 h.p. **SINGER**, 1912, 3-speed gear ..... £22 10  
3 h.p. **HUMBER** triear ..... £5 5  
3 h.p. **PREMIER**, 1911, B.S.A. 2-speed, and Millford Sidecar ..... £24 0  
1 1/2 h.p. **WOLF**, 1912, magneto ..... £9 10  
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**LATE** 1912 B.S.A., clutch, good wicker sidecar, F.R.S. lamp, tools, horn, etc., in perfect condition, like new, fine solo mount; £30.-258, Goldhawk Rd., Shepherd's Bush. [X1601]

**B.S.A.**, 1913 1/2, 2-speed, with Watsonian sidecar B attached (1914), both perfect condition, very little used, tyres practically new; take £45.-Golden, 9, Alexandra Rd., Gloucester. [X1536]

**PROMPTEST** Delivery Models H and K B.S.A., with No. 1 sidecar; also 1912 clutch model, with accessories, £30; deferred payments, exchanges.-Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9620]

**1915 1/2** B.S.A., 4 1/2 h.p., countershaft, K model, with a luxurious coachbuilt sidecar, head and tail lamps, watch, and accessories, only used a few times, in capital condition; £68/10.-Roberts, Wenallt, Llandudno Junction. [9801]

**B.S.A.**, 1913, clutch model, heavy tyres as new (Dunlop and Wood-Milne), Bosch waterproof mag., Amac carburettor, perfect condition throughout, including enamelling and plating; bargain, £36; exchanges.-Ideal Cycle Co., Thundersley, Essex. [9708]

**B.S.A.**, latest 1916, all black models in stock; 4 1/2 h.p., 3-speed countershaft gear, chain drive, model H, £64; chain-cum-belt model K, £62; B.S.A. sidecars, £16; exchanges or extended terms. Officially appointed B.S.A. agents.-Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0481]

**B.S.A.**, October (1915), 4 1/2 h.p., model K, chain-cum-belt, 3-speed countershaft, Palmer tyres, 2 new spare inner tubes, Stewart mechanical horn, F.R.S. head lamp (72/6), spare P. and H. ditto (32/6), rear lamp, knee-grips, complete set of tools, condition as new; £57/10.-Lt. Lindsay Jones, 4, Queen's Park View, Handbridge, Chester. [X1558]

## Calthorpe.

**CALTHORPE**, 2-stroke, 1915, 2 speeds, lamp, horn, good condition; £25.-Channell, West Lee, Dane Rd., Seaford. [9606]

**1914** 2 h.p. Calthorpe, 2-speed, in good running order, lamp, horn; £14/10.-Bellwood, 100, Falsgrave Rd., Scarborough. [9755]

**CALTHORPE**, 1915 1/2, 2-stroke, 2-speed, speedometer, as new throughout; £25.-Percy's, 537, Enston Rd., London. [9866]

**CALTHORPE**, latest pattern, new, 2 1/2 h.p., 2-stroke, latest model, with special mag.; £28/16.-Seen at 248, Bishopsgate, London. [9815]

**CALTHORPE**: Big value for little money.-Every model in stock at the Colmore Depot's London Agency, 44, Finsbury Pavement, E.C. [9793]

**CALTHORPE** 2-stroke, 2-speed, quite new, but slightly shop-soiled; special bargain, £28.-Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [9575]

**1914** Calthorpe Junior, 2-speed, lamps, etc., £17/10; also 1915 Calthorpe 2-speed 2-stroke, nearly new, lamps, etc., £27/10.-Newham, 223, Hammersmith Rd., W. [9698]

**CALTHORPE**, 1914, 2 h.p., 2 speeds; £13/10; cheapest Calthorpe in England, as proprietor joining army.-Adelaide Motor Co., 84, Chalk Farm Rd., N.W. 6056 Hampstead. [9775]

**CALTHORPE-J.A.P.**, 2 1/2 h.p., Enfield, 2-speed, quite new, but slightly shop-soiled; special bargain, £32/15.-Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [9574]

**CALTHORPE** Motor Cycles, 1916 Models.-Just arrived: 2-stroke 2-speed 31 gas., J.A.P. 2 1/2 h.p. 2-speed 36 gas.; easy terms arranged.-Storeys, 118, St. Portland St., W. [0777]

**CALTHORPE**, latest 1916 model, actually in stock; also one 2-stroke 2-speed, £29/10, 1915; and two single-speeds, £25 each; generous deferred terms.-Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9621]

## Campion.

**CAMPION**, 2 1/2 h.p., 2-speed, 6 weeks old; £24, offers.-49, High St., Kingston, Surrey. [X1527]

**CAMPION**.-All models from £30/16 to £70/8; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.-Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [9596]

## Chase.

**1914** Chase-Jap, 3 1/2 h.p., all accessories; £35.-Ross, 86, High Rd., Lee, S.E. [9753]

## Chater-Lea.

**CHATER-LEA**, 1914, countershaft 2-speed, chain drive, coach sidecar, lamps, accessories, beautiful turnout; £50.-David, 118, Shakespeare Rd., Acton. [9644]

**1915** Chater-Lea, 2 1/2 h.p., 2-stroke, 2-speed, countershaft gear, free engine, carefully used, fast, climb anything; bargain, £21, cost £36/10.-Clarke, 11, Earl St., Northampton. [X1528]

**1915** Chater-Lea, 8 h.p., 3 speeds, sidecar, screen, step, lamps, speedometer, horns, etc., in splendid condition, not done 1,500 miles; £72.-Martin, 29, Monstern Rd., High St. South, East Ham, London. [9635]

**3 1/2** h.p. Combination, Bowden countershaft gear, Chater-Lea frame, T.D.C. engine, Druid extra strong forks, cane sidecar, £25; Crescent cycle car, 2-speed gear, J.A.P. engine, £45.-W. Instone, Upper Church St., Brossley. [X1595]

## MOTOR CYCLES FOR SALE.

## Chater-Lea-Jap.

**CHATER-LEA-J.A.P.**, 3-speed, and coachbuilt sidecar; £21.—Seen at 248, Bishopsgate, London. [9808]

## Connaught.

**CONNAUGHT**, 3-speed gear, 2½ h.p.; £25.—Colmore Depot, 31, Colmore Row, Birmingham. [9837]

**CONNAUGHT**, 2-stroke, 1914, speedometer, knee-grips, complete spares, new Dunlop and butt-ended tube on back, little used; what offers?—Banks, Northfield, Hovingham, Malton, Yorks. [X0718]

## Coventry Eagle.

**1915 2½ h.p.** 2-stroke Coventry Eagle, almost new, been little used; £25.—Wallis, 49, High St., Saffron Walden, Essex. [X1515]

**COVENTRY Eagle**—All models from £36/15 to £92/8; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [9240]

## De Dion.

**2½ h.p.** De Dion, Bosch, B. and B., h.b.c., new tyres and tubes, grand puller; £8/10.—Lornie, Aylth. [X1605]

## Dot.

**DOTS**—All models from £38/10 to £81/18; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8588]

## Douglas.

**DOUGLAS**, 2½ h.p., V, 2 or 3-speed, in stock; from £50/8.

**DOUGLAS**, 2½ h.p., U, 2 or 3-speed, in stock; from £50/8.

**DOUGLAS**, 2½ h.p., W, 3-speed, clutch, in stock; £56/14.

**DOUGLAS**, 2½ h.p., X, ladies', kick start, in stock; £56/14.

**DOUGLAS**, 2½ h.p., War Office model, in stock; £54/12.

**DOUGLAS**, brand new, models U, V, W, and X, in stock, with C.A.V. magnets, at rock bottom net cash prices; lists on application. Douglas specialists. Tel.: 388. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [6864]

**1915 T.T. Douglas**, 2½ h.p., 2-speed; £40.—Shones, Gresford. [X1069]

**1914 Douglas**, 2½ h.p., semi-T.T., Lucas lamp.—Ross, 86, High Rd., Lee, S.E. [9750]

**MODEL U Douglas**, 3 speeds, in stock; 50 gns.—Cross, Agent, Rotherham. [X1547]

**DOUGLAS**, 1915, 3-speed U, practically unused; £44.—Art Shop, 92, St. Russell St., W.C. [9678]

**2½ h.p.** 1913 Douglas, condition like new, new tyres; £30.—61, Peckham Park Rd., S.E. [9586]

**DOUGLAS**, 1913, 2½ h.p., clutch, 2-speed, kick starter; £33.—Marshall, Castle St., Cambridge. [9555a]

**DOUGLAS**, 1914, 2-speed, clutch, new condition; £36/10.—11, Luna Rd., Thornton Heath. [9790]

**DOUGLAS**, 1914, 2½ h.p., 2-speed, all accessories, fine order; £35.—77, High St., St. John's Wood. [9796]

**DOUGLAS**, 1913, model N, T.T., do 40, all accessories; £28, offers.—Cawston, Bodeites, Godalming. [X1449]

**DOUGLAS**, 1913, 2-speed, free engine, good running order; £28.—Scott, Ironmonger, Westerham, Kent. [X1511]

**DOUGLAS**, 1914, 2 speeds, footboards, splendid condition; £35.—Pemberton, 15, Clifton Dale, York. [X1624]

**DOUGLAS**, late 1913, 2½ h.p., 2-speed, accessories; £35.—Walker, 6, King's Parade, Isleworth, Middlesex. [9783]

**DOUGLAS**, 2½ h.p., horn, head, tail lamps, spares; trial; 15 gns.—Troward, Heathurst, Vale, Hampstead. [9725]

**CONSULT** Rex Mandy before purchasing a new or second-hand Douglas.—See "Consulting Engineers" column. [9507]

**DOUGLAS**, late 1914, 2½ h.p., T.T., 2 speeds, footboards, perfect; £35/10.—Stocks, Thurlstone, Sheffield. (D) [X1583]

**DOUGLAS**, 2½ h.p., W, 2-speed, and clutch, footboards; £38.—Colmore Depot, 31, Colmore Row, Birmingham. [9840]

**DOUGLAS**, 2½ h.p. twin, new tyre and belt, fine machine; £15/10, offers.—Spechley, 45, Church Rd., Acton. [X1561]

**DOUGLAS**, 2½ h.p., 1913, 2-speed, in good condition; £27.—Seen by letter to Higgins, St. Thomas's Hospital, London. [X1425]

**DOUGLAS**, 1913, 2 speeds, T.T., very fast, horn, lamp, and spares; £32, or near.—Anstin, 18, Lewgate St., Chester. [X1571]

**DOUGLAS**, 2½ h.p., recently overhauled; seen running, and good tyres; £15, bargain.—385, York Rd., Wandsworth. [9716]

**DOUGLASES**, 1915 £42, 1914 T.T. £36, 1913 £30, all in first-class order.—Percy and Co., 337, Euston Rd., London. [9865]

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JAMES, 2½ h.p., 2-speed .....	£38 11
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NEW RYDER, 2½ h.p., 2-speed J.A.P. .....	£32 12
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ENFIELD, 6 h.p., Combination .....	£89 5
LEVIS, 2 h.p., Popular model .....	£28 1
B.S.A., 4½ h.p., and No. 2 Sidecar .....	£80 18
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P. & M., 1914, 3½ h.p., 2-speed, little used .....	£56
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P. & M., 1913, 3½ h.p., 2-sp., handle start .....	£40
VELOGETTE, 1915, 2½ h.p., 2-sp., 2-stroke .....	£32
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**DOUGLAS**, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas. Moffat, Yeovil. Tel.: 50. [9203]

**1913 Douglas**, 2½ h.p., lamps, horn, spares, exceptional good condition; any trial; £28.—3, Green Terrace, Rosebery Av., E.C. [X1436]

**DOUGLAS**, 1915, 2½ h.p. T.T., 2-speed, new condition, accessories, and spares, complete; £45.—Box L669, c/o The Motor Cycle. [9836]

**1915 2½ h.p.** Douglas, 2-speed, kick starter, clutch, horn, lamps, spares, little used; nearest £48.—Hillary, The Peak, Basingstoke. [X1563]

**DOUGLAS War Office Model**, new, 2-speed; £54/12; immediate delivery.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [9577]

**DOUGLAS**, 1914 (August), 2-speed, clutch, speedometer, lamps, specially good condition; £39.—Woodhouse, Heatherbank, Haslemere. [X1464]

**DOUGLAS War Office Model**, new, 3-speed gear and free engine; £52/10; immediate delivery.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [9576]

**2½ h.p.** Douglas (1914), 2 speeds, Lucas accessories, complete, Kempshall tyres, splendid condition; £43.—124, London Rd., St. Leonard's-on-Sea. [9612]

**DOUGLAS**—Call and see the 1916 models, which are actually in stock at the Colmore Depot's London Agency, 44, Finsbury Pavement, E.C. [9794]

**1911 Douglas**, Bosch mag., Hutchinson and Dunlop, Pedley belt, spring forks, totally overhauled; £15; seen after 6.—Crofts, 17, Sherbrooke Rd., Fulham. [X1429]

**DOUGLAS**, 3½ h.p., 1914-15, 2-speed, clutch, speedometer, spare valves, tyre, Binks 3-jet carburettor, cane sporting sidecar; £46.—11, Heathfield Rd., Acton. [9830]

**1914½ T.T. Douglas**, 2-speed, new tyres, speedometer, head light, belt case, mechanical horn, all in good condition; £40.—109, St. Michael's Rd., Aldershot. [9295]

**DOUGLAS**, late 1911, 2-speed, clutch, engine exceptionally good condition, tyres perfect.—Binks, Lucas lamp, spares; £23.—Petty Officer Tooth, Shipton-under-Wychwood. [9674]

**1915 Douglas**, 4 h.p., 3-speed, kick starter, excellent condition, mileage 1,000, complete with lamps, etc.; £57/10.—The Premier Depot, Holdenburst Rd., Bourne-mouth. [9531]

**DOUGLAS**, 1914, 2½ h.p., model U, 2-speed, footboards, tyres nearly new, condition of engine, gear box guaranteed; £36.—Robinson's Garage, Green St., Cambridge. [9866]

## Dreng.

**DRENG** Lightweight Motor Cycles, 27 gns.; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8589]

## Dunkley.

**DUNKLEYS**—All models from £35 to £89/5; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [9238]

## Elswick.

**ELSWICK**, 3½ h.p., 1912, sidecar, very good condition; £28.—Ayers, 21b, Emery St., Cambridge. [9691]

**1915 Elswick**, Precision 2½ h.p., 2-stroke, as new; £21.—Write, Spink, 28, Winfrith Rd., Earlsfield, S.W. [9593]

## Enfield

**6 h.p.** Enfield Combination; £46; perfect.—F. Wardle, Rothwell, Leeds. [X1575]

**ENFIELD**, 2½ h.p., twin, good tyres, mag.; £14.—Harry's, Market Place, Romford. [9766]

**ROYAL Enfields**, 1915, second-hand 6 h.p. combinations, from £70; trial run.—Below.

**ROYAL Enfields**, new 1916 combinations; £89/5, in stock; exchanges; beginners taught free.—Below.

**ROYAL Enfields**—For Woolwich, Plumstead, Greenwich, Blackheath, Charlton, North Woolwich, and Silvertown, sole district agent, W. Hill, 20, High St., Woolwich. [X9387]

**1913 Enfield Combination**, 1915 improvements; £48.—Ross, 86, High Rd., Lee, S.E. [9751]

**ENFIELD**, 1916, 3 h.p. twin, 50 gns.; also 6 h.p. combination, 85 gns.; delivery from stock.—Below.

**ENFIELD**, 1915, 3 h.p., 2-speed, twin, Lucas horn, speedometer, lamp set, watch, and holder, rear lamp, condition as new, mileage 1,000; cost £60, lowest £44.—D. J. Shepherd and Co., Enfield Highway. [9806]

**ENFIELD**, 2½ h.p., thoroughly overhauled, perfect; offers.—275, Bramstone Rd., Burton-on-Trent. [9548]

**ENFIELD**, 1911, 2½ h.p. twin; £11/11, offers; must sell.—Gasson, Talbot, St. James's Rd., Kingston. [X1525]

**1915½ 3 h.p.** Enfield, mileage 400; sell at 25% off list price; private.—Glanaraeth, Bridge St., Port Talbot. [X1600]

**ROYAL Enfield**, 2½ h.p., 2-speed, free engine, good lamp, horn; £20.—Vech, St. Ambrose Hall, Westbourne. [X1554]

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SUNBEAM, 3½ h.p., 3-speed	£73 10
SUNBEAM, 8 h.p., 3-speed	£94 10
EXCELSIOR (American), 7 h.p., 3 speeds	£75 0
CALTHORPE Minor Sporting 2-seater	£235 gns.
MORGAN, M.A.G. engine, and accessories	£113 13
MORGAN de Luxe and accessories	£117 18
NEW IMPERIAL, 2½ h.p., 2-speed	£36 15
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OVERLAND Touring Car, electric starter	£275 0
latest 1916 model	
DOUGLAS MODELS	Orders booked now

## U.S.A. EXCELSIOR.

1916, 7 h.p., twin, 84 x 89, mechanical and hand lubrication, kick starter, high-tension magneto, spring forks, 2-gallon petrol capacity, 3-speed countershaft gear, multiple disc clutch with hand and foot control, handle-bar control, spring seat-pillar, 3in. non-skid tyre, finish Excelsior grey; latest 1916 model, £75.

We are sole Yorkshire distributors. Liberal terms to trade.

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to suit American Excelsior and Harley-Davidson machines, 28 x 3 Dunlop tyre, grey-coach-built body and chassis

£13 10

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1914 2½ h.p. 2-speed F.E. CLYNO, 2-stroke	£28 10
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1913 3½ h.p. ROVER, 3 speeds	£37 10
1913 2½ h.p. J.P. Magneto Lightweight	£16 10
1913 3½ h.p. ROVER, Grado gear	£27 10
1912 3½ h.p. ZENITH-GRADUA	£28 10
1912 3½ h.p. 2-speed F.E. BRADBURY	£29 10
EXCELSIOR, 3½ h.p., 3-speed, Druid forks	£19 19
2½ h.p. 2-speed DOUGLAS	£24 10
8 h.p. 3-speed CHATER-LEA	£33 10
1910 3½ h.p. Tourist TRIUMPH	£22 10
KERRY, 3 h.p., magneto, Saxon forks	£12 10
5½ h.p. Magneto REX, spring forks	£12 10
N.S.U., Twin, 2-speed, spring forks	£15 10
REX, 3½ h.p., magneto, spring forks	£14 10
DOUGLAS, 2½ h.p., twin, spring forks	£16 10
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## £145 RITZ LIGHT CAR. £145

The last word in light car values; 10 h.p. 4-cylinder, mechanical lubrication, electric horn and lighting, hood, screen, tools; luxuriously sprung, and a grand top gear car. Deliveries from stock. Trial runs by appointment. Exchange liberally catered for.

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Brand New 1914-15 6 h.p. REX Sidette	£69 10
1914 6 h.p. REX Sidette, almost as new	£53 10
W.C. WILLIAMSON and Sidcar (new)	£89 15
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1912 6 h.p. REX, 2-speed, and Sidcar	£34 10
1912 3½ h.p. 2-speed PREMIER and Sidcar	£33 10
8 h.p. 3-speed CHATER-LEA-J.A.P. and coach-built Turner Sidcar	£38 10
1910 3½ h.p. 2-speed REX and Sidcar	£24 10

## MISCELLANEOUS.

WILLIAMSON, 3-speed Cy-cl-a-new	£126 0
MORGAN, 1914, Sporting, hood, screen, etc.	£82 10
PREMIER, 7-9 h.p., 2-seater Car	£67 10
Cycle Car Front and Rear Axles and Wheels	£2 15
New Upholstered Sidcar Bodies	12/6, 13/6
Triumph Pattern Horns	5/9, 8/9
1915 Kex Coach Sidcar, brand new	£12 10
New Mechanical Horns, special reduced price	15/11
Triumph Pattern Horns (new)	5/11

## MOTOR CYCLES FOR SALE.

### Enfield.

CONSULT Rex Mundy before purchasing a new or second-hand Enfield.—See "Consulting Engineers" column.

ROYAL Enfield, 2½ h.p., late 1915, 2 speeds, accessories; £27, offers; faultless.—Walsham, 22, Alpha Rd., Millwall. [9599]

ENFIELD, 2½ h.p., horn, head, tail lamps, spares, new tyre; trial; 14 gus.—Troward, Heathurst, Vale, Hampstead. [9726]

ENFIELD, 1916, 3 h.p., just arrived from works: £52/10.—Wilkins, Simpson, and Co., 11, Hammer-smith Rd., London. [9583]

ROYAL Enfield, 2½ h.p. twin, just overhauled, good condition; £15, or exchange higher power.—212, St. Paul's Rd., Highbury. [9573]

1912 Enfield 6 h.p. Combination, 2-speed, coach-built, perfect, any trial; £47/10.—Harry's, Market Place, Romford. [9765]

ENFIELD Coach Combination, 1914, fitted Jones speedometer; seen evenings after 7.—23, Champion Grove, Denmark Hill, S.E. [9764]

ENFIELD Combination, 6 h.p., 1914, Lucas lamps, speedometer, etc., good condition; £50.—Parks, 395, High Rd., Leytonstone, N.E. [9584]

1915 6 h.p. Enfield Combination, complete with head, side, and tail lamps, horn, etc., perfect condition; £67/10.—54, Wyndham Rd., Salisbury. [9588]

1912 6 h.p. Enfield, special wide coachbuilt sidecar to seat 2, accessories, etc.; £45, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [9722]

ENFIELD 6 h.p. 1916 Combination, just arrived from works; immediate delivery; £89/5; make sure of this now.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [9578]

1912½ 2½ h.p. Enfield, twin-cyl., 2-speed, and free engine, engine, gears, enamel, and plate first-class condition, lamp, horn, and tools; bargain, £25.—King and Harper, Cambridge. [X1669]

ENFIELD, 3 h.p., 2 speeds, 1916 model, purchased November, only done 500 miles, condition as new, Long horn; £45; purchasing light car.—Haynes, Vicerage, St. Mary's Terrace, Paddington. [X1057]

NEW 40 g. Royal Enfield, 2-stroke, 2 speeds, done 300 miles only, complete with lamp set and horn; accept £35, and ride to purchaser.—A. Davis, Oak Tree Cottage, Tibberton, near Gloucester. [X1593]

ENFIELD 6 h.p. Combination, cane body to sidecar, enamelling and plating as new, machine in splendid condition, engine perfect; £45, or take solo machine and cash.—14, Griffiths Rd., Wimbledon, S.W. [9775]

ENFIELD, 1916, latest model, 2-stroke, 2½ h.p., 2-speed, and free engine, chain drive, just arrived from works; immediate delivery; £42; make sure of this now.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [9581]

ENFIELDS.—3 h.p. and 6 h.p. and electric De Luxe models in stock; also 1913 6 h.p. £45, 1914 6 h.p. £65, 1916 75 g. gas; deferred payments, good allowances.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [9618]

### Excelsior.

EXCELSIOR (American), 7-9 h.p., electrically equipped, special sidecar, not done 300 miles; cost £120. £75.—Colmore Depot, 31, Colmore Row, Birmingham. [9849]

AMERICAN Excelsior, 1916 models, £75, De Luxe £85; immediate delivery. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8597]

### F.N.

F.N., 2½ h.p., new, 2-speed, clutch; bargain.—Alexr. Shand, Banbury. [X1662]

1911 5-6 h.p. F.N., splendid condition, modern fittings; £15.—Beesley, Charlestown, Blackley, Manchester. [9820]

F.N., late, 6 h.p., 4 cyla., very fast, beauty, like new, complete; gilt, £27; every afternoon.—36, Stapleton Hall Rd., N. [9641]

F.N., 2½ h.p., 1910, 2-speed, clutch, mag., powerful, tyres good; £29.—Stewart, 65, Gt. Jackson St., Hulme, Manchester. [X1609]

F.N., 5-6 h.p., practically new, 4-cyl., clutch, Bosch; selling for rent; best offer over 20 gus.—Beardshaw, Auctioneer, Wood Green. [9760]

MOTOR, F.N., 1913, 4-cyl., 5 h.p., 2 speeds, mag., Bosch, waterproof, carburettor, Amal, like new; any trial; £26.—12b, Morat St., Buxton, S.W. [9550]

F.N., 4-cyl., and 2-speed gear model, fitted with a coachbuilt sidecar, 5-6 h.p., handsome combination; £35.—Wauchope's, 9, Shoe Lane, London. [X1619]

F.N., 2½ h.p., mag., spring forks, fitted with a new 3-speed back hub, cost £10/10, guaranteed in good order; £14.—Percy and Co., 337, Euston Rd., London. [9859]

F.N., 5 h.p., 4-cyl., fast machine, with handsome sidecar, in thoroughly good order; great bargain, £20, complete; owner at Front—Hucklebridge, 133, Sloane St., S.W. [9602]

# SPECIAL SNIP!

Light Cycle Car Chassis, new 26 x 2½ in. tyres, wheel steering, 2-speed gear box, tank, etc.; the lot, £12. Tyres almost worth it.

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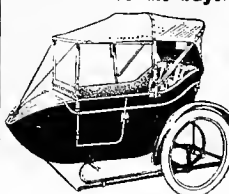
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4-speed gear	£98 0
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1916 6 h.p. J.H. Combination	90 gns.
1916 5-6 h.p. EXCELSIOR, Sturmeys 3-speed countershaft gear	68 gns.
1916 4½ h.p. EXCELSIOR, Sturmeys 3-speed countershaft gear	64 gns.
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on	£120 0

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5-6 h.p. twin BAT, J.A.P. engine, spring frame, reed cane sidecar, very smart, fine gear	£12 0
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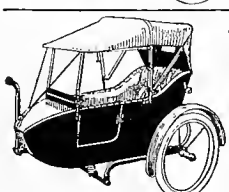
Built throughout in our own factory. Farlow Sidecars have that pleasing style, exquisite finish, and lasting qualities which are the buyer's ideal.



MODEL 3.  
Underslung Chassis, with Luggage Carrier combined.

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Hood £2 4s. Screen £1.



This is MODEL No. 1.

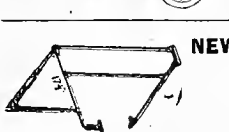
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New 650 x 65 Dunlop rubber-studded covers	22/6
8-10 h.p. Precision Engine, quite new. What offers?	
6 h.p. Twin Antoine Engine, water-cooled...	£6 0
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New Binks Carburettor, motor cycle type	35/-
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Cowey Speedometer, for Morgan	£2 5
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Lukin Cycle Car Carburettor, new condition	15/-
Cox Cycle Car Carburettor	10/-

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Hopwood Lane, HALIFAX.



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## F.N.

F.N. Motor Cycle, good condition; owner gone Salonika; accept nearest offer £14; also new sidecar, rush wicker, leather upholstered, accept nearest offer £5/10; sell together or separately.—Box No. 35, c/o The Motor Cycle. [8589]

F.N. 1915, 25 h.p., 2-speed, shaft drive, handle-bar clutch, new Lucas lamps and horn, new saddle and footboards, nearly new Kempsall, Dunlop tyres, perfect condition; bargain, £24.—2, St. Helens Rd., Bolton. [X1607]

## Grandex.

GRANDEX-J.A.P., 31/4 h.p., Gradua multiple pulley; £40.—Colmore Depot, 31, Colmore Row, Birmingham. [9846]

## Harley-Davidson.

HARLEY-DAVIDSONS in Stock.—Premier Motor Co., Birmingham.

MODEL 11J, with dynamo electric lighting; £76/15, duty free.—Premier Motor Co., Birmingham. [8684]

HARLEY-DAVIDSON Models in stock, complete with Gloria sidecar.—Turpins, 22 and 29, Preston Rd., Brighton. [9713]

1915 Harley-Davidson, 4 h.p., 2-speed, and £15/15 Canoelet sidecar, guaranteed perfect, unpunctured; £54.—Box L668, c/o The Motor Cycle. [9852]

1915 Harley-Davidson, 11J, 3-speed, dynamo lighting, run 50 miles, unstretched; £70; consider lightweight part.—53, Gunterstone Rd., Kensington. [9778]

HARLEY-DAVIDSON, 11J model, nearly new, 3-speed, electric light, and all spares, only ridden 1,466 miles; bargain, £65.—Dominy, Jewry St., Winchester. [9542]

HARLEY-DAVIDSON.—For careful attention to your requirements, and best terms, get in touch with the firm who introduced the "Silent Grey Fellow" to the Midlands. A few models 11J, with electric dynamo lighting equipment, head lamp, tail lamp, and horn, free of duty, £76/15. Buy now and save money.—The Premier Motor Co., Aston Rd., Birmingham. [8685]

## Henderson.

HENDERSON Combination, October, electric, acetylene, foot clutch, unpunctured; offers.—233, Clapham Rd., S.W. Brixton 826. [9774]

10 h.p. Henderson, 1914 model, fitted with coach-built sidecar, 4-cyl. engine, powerful machine; £55; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X1618]

## Humber.

1911 Humber, 3 1/2 h.p., 2-speed, Bramble sidecar, splendid condition; £29/10.—122, Craven Rd., Rugby. [X1586]

HUMBER and Sidecar, 3 1/2 h.p., free engine, good condition; £10; after 7.—Chitty, 133, Sandhurst Rd., Catford. [9458]

1914 2 1/2 h.p. Twin Humber, 3-speed gear, engine as new, all in perfect order; £25.—Wallis, 49, High St., Saffron Walden, Essex. [X1517]

HUMBER, 3 1/2 h.p., 2 speeds, coachbuilt sidecar, in tip-top order and condition; £25.—Percy and Co., 337, Euston Rd., London. [9544]

2 1/2 h.p. Twin Humber, 1914, 3-speed, and clutch, good condition, very fast, just overhauled; £27.—Box No. 47, c/o The Motor Cycle. [X1670]

FOR Sale, 2 h.p. Humber, 1913, in running order; £15/10; consider push bike part exchange.—Thomas Clark, Owston Ferry, Doncaster. [X1579]

HUMBER 3 1/2 h.p. Combination, late 1911, 2-speed, free engine, new sidecar, condition as new; £27/10.—136, St. Ann's Rd., Tottenham. [1535]

1913 3 1/2 h.p. Humber, 2 speeds, handle starting, new tyres, in grand condition; £26/10, or offer.—W., 12, Blackhorse Lane, Walthamstow. [X1603]

LATE 1911 3 1/2 h.p. Humber, overhauled, and in sound mechanical condition; £14/10.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [9567]

HUMBER, 3 1/2 h.p., clutch, sidecar, new January, 1914, guaranteed, tyres and belt, nearly new, all accessories, excellent condition throughout; £38.—Lelen, Bibury, Shrewsbury Rd., Beckenham. [9757]

3 1/2 h.p. Humber, 2-speed, free engine, over £20 paid during last year for new gears, camelling, new tank, etc., by officer now in France, perfect condition; must be sold.—Letters, Fairbrother, Grocer, Moira, Leicestershire. [X1552]

HUMBER, 1912, 3 1/2 h.p., 2-speed, new 26x2 1/4 Palmer and Hutchinson tyres, Bosch mag., lamps, and horn, appearance as new, complete with comfortable cane sidecar; £25.—The Premier Motor Co., Aston Rd., Birmingham. [9855]

## Indian.

INDIAN C.B. Combination, 2 speeds, condition like new; £42.—Slack's Garage, Stockport. [X1452]

INDIAN, 5-6 h.p., single speed, good order, 1911; £22/10.—Morris, 139, Finchley Rd., N.W. [X1325]

INDIAN, 1915, T.T., clutch, tyres as new, reliable, fast; £43.—Western Motor Co., Hammersmith. [9637]

INDIAN, 1915, 5 h.p., 3-speed, condition as new, Lucas accessories; £55.—Jackson, Argyle Cottage, Ambleside. [X0369]

## MOTOR CYCLES FOR SALE.

## Indian.

NEW 1916 Powerful Indian, 7 h.p., 3-speed; bargain, £70; don't miss this.—Box 12, c/o The Motor Cycle. [X1059]

1915 Indian, 5-6 h.p., 3-speed, done 700 miles, as new; quick sale £50.—Cox, 29, Green St., Cambridge. [X1543]

CONSULT Rex Mundy before purchasing a new or second-hand Indian.—See "Consulting Engineers" column. [9509]

INDIAN, 1912, 2-speed, kick starter, coach sidecar; any trial; perfect; £34.—Beverley, Southwold Rd., Watford. [9784]

INDIAN, 1914, T.T., 7-9 h.p., 2-speed, good condition; bargain, £38.—97, Drayton Gardens, South Kensington. [9536]

INDIAN, 5 h.p., late 1915, 3-speed, lamps, etc., only ridden a few hundred miles; £48.—Longman Bros., King St., Acton. [9684]

INDIAN, 7-9 h.p., racing model, splendid condition, new last June, all accessories; £47.—Blandea, Little Wilbraham, Cambs. [9587]

INDIANS, 1916, all models, in stock, immediate delivery; exchanges arranged.—Percy and Co., 337, Euston Rd., London. [9867]

1915 Indian, 5 h.p., 3-speed, Mills and Fulford sidecar, perfect order, new September; £60.—6, High St., Brightonsea. [9305]

1914 Indian Combination, complete, electric lighting, speedometer, excellent condition; £50.—170, Norbury Crescent, London, S.W. [X1055]

1915 5 h.p. Indian, 3-speed, clutch, kick starter, lamp, horn, tools, excellent condition throughout; £52.—King and Harper, Cambridge. [X1668]

3 1/2 h.p. Twin-cyl. 1915 Indian, 3-speed gear model, complete with all accessories; £45; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X1616]

1915 7-9 h.p. Indian (new August), spring frame, electrically equipped, speedometer, under 1,000, like new; £58.—Freedman, Penygraig, Glam. [9681]

INDIAN, 1915, 5 h.p., perfect condition, speedometer, head and tail lamps, 2 generators; £50, no offers.—Harris, 91, Woodfield St., Morriston, Glam. [X1597]

1914 7-9 h.p. Indian, 2-speed, clutch, electric equipment, Montgomery De Luxe sidecar, hood, and screen; £60.—Langan, 292, Kingsland Rd., London, N. [X1570]

INDIAN, 5 h.p., 1915 3/4, 3 speeds, Milford sidecar, lamps, spares, little used; £55.—Lieut. Hancock, Clearing Station, B. Lines, West Camp, Hulton Park, Tring. [9605]

INDIAN, 1915 1/2, almost new, sporting Indian coach-built sidecar, 3 speeds, speedometer, done 1,300 miles, guaranteed as new; £60.—Percy and Co., 337, Euston Rd., London. [9862]

INDIAN, 7-9 h.p., 1915, 3-speed gear, £20 Gloria sidecar, fitted with hood and screen, machine electrically equipped, not run 1,000 miles, as new; £75.—Dau Guy, Weymouth. [9661]

1914 7-9 h.p. 2-speed Indian Coachbuilt Combination, electric equipment, speedometer, etc., done 4,000, perfect; £55, or consider exchange; Derbyshire.—Box 34, c/o The Motor Cycle. [X1631]

7 h.p. Road Racing Indian, clutch model, new August, 1915, not run 700 miles, and in perfect condition, Lucas lamps, Lucas horn, spares; £56.—Crow Bros., 190, High St., Guildford. [9405]

INDIAN, 1914, for immediate sale, belonging to officer gone abroad, 7-9 h.p., road racing, 310, exhaust pipe, run about 7,000-8,000 miles, good condition; price £43, no offers.—Apply, 12, York Terrace, Regents Park. [X1424]

1916 Power Plus Indian, 3-speed, and sidecar, £96; also 1915 5 h.p. 3-speed model, £70; both the above machines in stock.—Julian, Broad St., Reading. Biggest motor cycle dealer in the South. 'Phone: 1024. [X1591]

INDIAN, C, 7-9 h.p., 1915, 3-speed combination, brand new cycle tyres, 19 gn. Milford sidecar, mechanically perfect; £75; owner enlisted; seen any time by previous appointment.—78, Lee Rd., Blackheath, S.E. [9676]

1914 India, 7 h.p., 2 speeds, clutch, kick starter, electric lamps and horn, speedometer, all accessories, coachbuilt torpedo sidecar, little used; any examination; offers.—R. Bamber, 33, Liverpool Rd., Southampton. [9195]

1915 Twin 5 h.p. Indian, fitted with 3-speed gear, Cowley speedometer, and all accessories, only been 3,000 miles, condition as new, guaranteed to do over 60 miles per hour; £57.—Godfrey, 529, King's Rd., Chelsea. [9800]

INDIANS.—All models from £49/10 to £90; early delivery. No connection with any adjoining concern whatsoever. Office hours 8 a.m. to 6 p.m. Closed dinner hours.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [8600]

1915 Indian 7 h.p. Road Racer, clutch model, large Miller lamp, Klaxon horn; only 38 m.p.h.; property of an officer just gone to the Front, very great bargain.—Julian, Broad St., Reading. Biggest motor cycle dealer in the South. 'Phone: 1024. [X1541]

**Best Value**

in New Season's models to-day awaits every KEEN Buyer at EVANS' well-known Depot in John Bright Street.

Controlling Bham Agent:

**INDIAN, A.J.S., BAT ENFIELD, ROVER, NORTON, CONNAUGHT, ZENITH, NEW IMPERIAL.**

Also Agent for **Triumph and James.**

Here's a few examples:

INDIAN, 7 h.p., 3 speed, electric equipment.....	£78 0
INDIAN, 5 h.p., twin, 3 sp.....	£70 0
ROVER, 3 1/2 h.p., T.T., with Philipson.....	£56 0
ENFIELD, 2 1/2 h.p., 2 sp., 2 stroke.....	40 gns.
ENFIELD, 6 h.p., coach Combination.....	85 gns.
A.J.S., 2 1/2 h.p., 3-speed, kick-start.....	£58 0
A.J.S., 4 h.p., twin, 3-sp.....	£78 0
A.J.S., 4 h.p., 3-sp., twin, and Sidecar.....	£93 17
A.J.S., 6 h.p., 3-speed twin, and Sidecar.....	£102 18
NORTON, 3 1/2 h.p., T.T.....	£52 10
NORTON, 4 h.p., 3-sp., coach Combination.....	£85 0
NEW IMPERIAL, 2 1/2 h.p., J.A.P., 2-speed.....	35 gns.
CONNAUGHT, 2 1/2 h.p., Standard.....	£35 3
CALTHORPE, 2 1/2 h.p., J.A.P., 2-speed.....	35 gns.
JAMES, 4 1/2 h.p., 3 speed, Big Single.....	£86 5
JAMES, 2 1/2 h.p., 2 speed, 2 stroke.....	£38 12 6

Free Trial Run on ANY machine—Special Payments—Liberal Exchanges—Immediate Deliveries—Satisfaction guaranteed.

**Call NOW—over 100 machines awaiting YOUR inspection!**

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**87-91, John Bright St., BIRMINGHAM.**

## MOTOR CYCLES FOR SALE.

P. and M.

**1915** 3½ h.p. P. and M., August, P. and M. sidecar to match, Cowey speedometer, Lucas lamps, etc., perfect condition; £75.—Lient. Vernon, R.E., Houghton Hall, Dunstable. [X1492]

**P. and M.** 3½ h.p., 1914, first-class condition, coachbuilt sidecar, Lucas lamps, all fittings; £48, or near offer, a bargain.—Parkstone, Coombe Rd., New Malden, Surrey. [X851]

**P. and M.** 3½ h.p., 1913, with P. and M. coachbuilt sidecar, lamps, generator, wind screen, luggage carrier, and speedometer, in splendid condition; £45.—Box 46, c/o *The Motor Cycle*. [X9679]

Peco.

**PECO**, 2½ h.p., 349 c.c., 2-stroke, 1916, brand new; sacrifice £28/10; photo.—No. 58, c/o *The Motor Cycle*. [X1546]

Peugeot.

**312** h.p. Peugeot, Naylor 2-speed, perfect; bargain, £18.—Cox, 29, Green St., Cambridge. [X1542]

**5** h.p. Peugeot and Sidecar, Bosch mag., B. and B. carburetter, 3-speed, handle-starting, in good condition; £30.—H. Monk, 5, Sun St., Waltham Abbey. [X9720]

Precision.

**PRECISION** 2½ h.p. Unit, complete, new, £12; Tororo ditto, new, £9/10; also new silencer, with plated pipe and nut, and 4 engine plates, 15½; Thomson-Bennett 4-cyl. water-tight magneto, clockwise, new, £9.—Wood, 114, Rea St., Digbeth, Birmingham. Tel.: 631 Mid. [X9528]

Premier.

**PREMIER**, 3½ h.p., 1911 T.T., grand condition; £13.—Warwick, 80, Dorset St., Leicester. [X1550]

**PREMIER**, 1913, 2-speed, perfect running order; half-price.—Particulars, apply Manager, Union Bank, Blackpool. [X1606]

**PREMIER**, 1914, 4 h.p., Armstrong 3-speed, clutch, little used, guaranteed perfect everywhere; £35.—King's Garage, Pewsey, Wilts. [X9556]

**1914** Premier 3-speed Combination, horn, head, tail lamps, spares; 34 gns., or lower power and cash.—Troward, Heathurst, Vale, Hampstead. [X9727]

Quadrant.

**1916** Quadrant, belt-cum-chain, B.S.A. countershaft 3-speed gear, and Canolet sidecar; £72/10; generous deferred payments. Liberal allowances.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X9625]

**QUADRANT**, latest 1916 all-black models in stock; 4½ h.p., 3-speed, B.S.A. countershaft gear, chain-cum-belt model, £60; 3-speed Sturmer-Archer gear model, £49/12/3; delivery from stock; exchanges or extended terms.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X0551]

Radco.

**RADCO** Lightweight, 2½ h.p., 2-stroke; £25.—248, Bishopsgate, London. [X2816]

**NEW** Radco, 2½ h.p., 2-stroke, Palmer tyres; £25.—188, High Rd., Ilford. [X0731]

**RADCO** No. 2 2½ h.p., 2-stroke, in stock; £25/7.—Harry's, Market Place, Romford. [X9771]

**RADCO** 2½ h.p., 2-stroke Lightweight, Aug., 1915, perfect condition; £22/10.—51, Gilpin Av., East Sheen, S.W. [X1598]

**SECOND-HAND** Radco, No. 2, 2½ h.p., used 800 miles, splendid condition; £21, best offer.—188, High Rd., Ilford. [X9600]

Regina.

**REGINA** 4½ h.p., 1914 Combination, 3-speed, kick starter, luxurious coachbuilt sidecar, wind screen, speedometer, watch, etc., sidecar and bike tank enamelled to match, elaret; exceptional bargain, £40.—See below.

**REGINA**, 3½ h.p., 1914 engine, in 1915 frame, new tank, etc., kick starter, brand new Dunlop tyres and belt, new handle-bars, all black; owner at the front; £30, or nearest offer.—S. Barnett, Pelham St., Derby. [X9590]

Rex.

**1913** Rex, 6 h.p., 2-speed, and free, handle start; £40, or near.—Shone, Gresford. [X1551]

**REX**, 3½ h.p., 2-speed reliable, faultless; £12, offers.—7, Fairfax Rd., Hampton Wick. [X1526]

**REX** Combination, 6 h.p., 2-speed twin, coachbuilt sidecar, in perfect condition; £33.—Lunn, Northwick Rd., Evesham. [X1457]

**REX** Combination, 1913, 4 h.p., 2-speed, new tyres, excellent condition, carefully driven; £28, bargain.—2, Oakdene, Chobham. [X1649]

**REX** 1913 6 h.p., 2-speed De Luxe model and sidecar; £20, or nearest offer.—Pickup, St. Benedict's, Thornecombe Rd., East Dulwich. [X1061]

£25/10.—Rex motor cycle, 3½ h.p., 2 speeds, free engine, handle-starter, ready to ride away.—After 7 p.m., 23, Janson Rd., Leytonstone, Stratford, London. [X9748]

**REX**, 5-6 h.p., engine just overhauled, good tyres, Mabon clutch; bargain, £15; must sell, owner joining up.—Chris. K. Britt, Chapel Av., Bourton, Dorset. [X1422]

**REX** 6 h.p. Twin, 1914, brand new coachbuilt sidecar, lamp, speedometer, horn, accessories; nearest £55, bargain; excellent combination.—Coldham, Bridge St., Northampton. [X1564]



## New Models from Stock.

## MOTOR CYCLES.

**A.J.S.**, 4 h.p., twin, 3-speed.  
**B.S.A.**, 4½ h.p., 3-speed, all chain drive.  
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**BROUGH**, 3½ h.p., twin, 3-speed, countershaft gear, Model H.C.  
 3½ h.p., twin, 3-speed, Model H., T.T.  
**CALTHORPE**, 2-stroke, 2½ h.p., 2-speed.  
 2½ h.p., J.A.P., 2-speed.  
**DOUGLAS**, Model V, 2½ h.p., 2 or 3-sp.  
 Model W, 2½ h.p., 2 or 3-speed.  
**ENFIELD**, 2-stroke, 2½ h.p., 2-sp. d.  
 Model 140 3½ h.p., twin, 2-speed.  
 6 h.p. coach-built Combination.  
 6 h.p. Combination, dynamo lighting.  
**JAMES**, 2-stroke, 2½ h.p., 2-speed.  
 3½ h.p., twin, 3-speed.  
 4½ h.p., 3-sp. d. and James Canolet/Sie  
**NEW IMPERIAL**, 2½ h.p., J.A.P.  
 engine, 2-speed.  
**TRIUMPH JUNIOR**, 2½ h.p., 2-stroke,  
 2-speed.  
**ZENITH**, 4-5 h.p., clutch model, Gradua  
 gear.

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**REX J.A.P.**, 1912, 6 h.p., 2-sp., all accessories, and underslung sidecar £38  
**ZENITH**, 1½ h.p., clutch and Gradua gear, lamps, horn, and speedometer ..... 35  
**TYLER**, 1915, 2½ h.p., 2-stroke, 2-sp. 28  
**ROYAL ENFIELD**, 1911, 3 h.p., 2-speed and kick-starter, Model 140 35  
**TRIUMPH**, 1911, 3½ h.p., clutch model, lamps, horn, and speedometer 38  
**TRIUMPH**, 1912, 3½ h.p., clutch model 30  
**TRIUMPH**, 1913, 3½ h.p., clutch model 34  
**TRIUMPH**, 1914, 4 h.p., 3-sp. and model, head lamp, horn and back lamp 46  
**TRIUMPH**, 1914, 4 h.p., 3-sp. lamps and horn, and Gloria Sidecar, 56  
**B.S.A.**, 1915, 4½ h.p., 3-speed, chain drive, Lucas dynamo lighting set, and de Luxe sidecar, upholstered in Bedford cord ..... 75  
**ALLEN**, 1915, 2½ h.p., 2-stroke, 2-speed and clutch ..... 35  
**MATCHLESS**, 1914, 4 h.p., twin, 3-speed, and Gloria Sidecar ..... 50  
**BRADBURY**, 1912, 3½ h.p., 2-sp. gear, head lamp, back lamp, horn, and speedometer ..... 27  
**INDIAN**, 1915, 5 h.p., 3-speed, and special de Luxe sidecar ..... 68  
**RUDGE-MULTI** Combination, 1913, 3½ h.p., coach-built, fitted with head and screen ..... 42  
**A.J.S.**, 1914, 6 h.p., 3-speed, speedometer, Lucas horn, Lucas head light, side and tail lamps, and 20 gns. Gloria Sidecar ..... 75  
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## MOTOR CYCLES FOR SALE.

Rev.

**BARGAIN**.—6 h.p. Rex, free engine, Bosch, handle starter, good condition, wants re-timing; owner called up; too cheap approval; £18.—162, St. Helen's Av., Swansea. [X9561]

**REX** 1914 Motor Cycle, with sidecar, 2-cyl., 6 h.p., free engine, handle starter, 2-speed, good condition; £40.—Apply, 22, Cornwall Rd., Waterloo Station, before 11 a.m., after 6 p.m. [X9631]

**REX**, 3½ h.p., good running order, also Minerva engine, frame, wheels, tank, carburetter, tube, etc.; what offers?—Particulars, S. H. Evans, White House, St. Mark's Rd., Maidenhead. [X9721]

**REX**, latest model, 6 h.p., with coachbuilt sidecar, never used, owner called on active service before delivery; £75, cost over 120 gns.; seen by appointment only.—Lewis, Fairlight Lodge, 121, Highbury New Park, London, N. [X0768]

Rover.

**ROVER**, 1915, countershaft; state price.—Boager, 19, Edendale Terrace, Gateshead-on-Tyne. [X1456]

**ROVER**, 3½ h.p., specially fitted; £40.—Colmore Depot, 31, Colmore Row, Birmingham. [X842]

**CONSULT** Rex Mundy before purchasing a new or second-hand Rover.—See "Consulting Engineers" column. [X9512]

**1914** Rover Combination, in grand order, £45; 1913 Rover combination, £40.—Cox, 29, Green St., Cambridge. [X1544]

**ROVER**, 3½ h.p., 1913, 3-speed gear, excellent order, and careful usage, good belt, tyres, head lamp; £30.—Rector, Strumpshaw, Norwich. [X1508]

**1916** Rover, 3½ h.p., T.T., Philipson pulley, accessories, ridden only 200 miles; £50, or nearest.—83, Alexandra Park Rd., Muswell Hill. [X9677]

**FOR** Sale, Rover motor cycle, 1915 model, 3½ h.p., little used; £58, or nearest offer.—Apply, A.M.S., Howitzer Barracks, Quinton Rd., Coventry. [X1531]

**ROVER** Combination, run 1,000 miles, guaranteed new, scarcely soiled or scratched; £60; speedometer, lamps.—Percy and Co., 337, Euston Rd., London. [X9861]

**1914** 3½ h.p. Rover and £15 Coachbuilt Sidecar, guaranteed in perfect condition, all accessories; 100 mile trial; bargain, £40.—Read, 1, Hare St., Bethnal Green, near Bishopsgate. [X9715]

**ROVER**, 1912, 3½ h.p., free engine clutch model, in exceptional order, new back tyre, enamel and plate like new, guaranteed sound order; bargain, £27/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X0552]

Royal Ruby.

**1915** Royal Ruby, 2-stroke, 2½ h.p., as new; £22.—Panting, Wing, Bucks. [X1071]

**ROYAL** Ruby, 2½ h.p., 2-stroke, single speed, new condition, guaranteed perfect everywhere; £22/10, bargain.—King's Garage, Pewsey, Wilts. [X9557]

Rudge.

**1913** Rudge and sidecar; 30 gns.—Julian, Winchester St., Basingstoke. [X0776]

**RUDGE**, 3½ h.p., free engine; £25.—Colmore Depot, 31, Colmore Row, Birmingham. [X8944]

**RUDGE** T.T., 1913, just overhauled, fixed engine; £25.—2nd Lieut. Daw, 2/9 Middlesex, Sevenoaks. [X9549]

**CONSULT** Rex Mundy before purchasing a new or second-hand Rudge.—See "Consulting Engineers" column. [X9513]

**1914** 3½ h.p. T.T. Rudge Multi, new tyre and belt, spares; perfect; £32.—Box 35, c/o *The Motor Cycle*. (D) [X1632]

**RUDGE**, 1913, T.T., clutch model, accessories, and speedometer, good condition; £25.—King's Garage, Pewsey, Wilts. [X9558]

**RUDGE** Multi, 1913, 3½ h.p., dynamo lighting, mechanical horn; £32, complete.—Lt. Nagel, St. Thomas's Hospital. [X9669]

**RUDGE** Multi, 1912, 3½ h.p., Lucas horn, tools, in splendid condition; £27/10 cash.—G. T. Capes, Laughton, Gainsborough. [X1578]

**1914** Rudge Multi, 3½ h.p., absolutely new condition, special machine; £38/10, genuine bargain.—Newham, 223, Hammersmith Rd., W. [X9695]

**6** h.p. Rudge Multi, fitted with roomy comfortable sidecar, complete with all accessories; £45; guaranteed.—Wauchope's, 9, Shice Lane, London. [X1617]

**RUDGE** Multi, I.O.M. T.T., August, 1915, done 1,200 miles, speedometer, and all accessories, very fast; £50.—Capt. Abell, 140, Harlaxton Rd., Grantham. [X0363]

**RUDGE**.—If you want to buy a good one let us know. If you want to sell one let us know.—Longman Bros. (Rudge Specialist), King St., Acton. 1578 Chiswick. [X9481]

**RUDGE** T.T., 3½ h.p., 1915, in practically new condition, special machine, picked engine, very fast; bargain, £37.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X0492]

**RUDGE** Multi 1914 3½ h.p. Combination with Rudge 18 gn. sidecar, hood, screen, speedometer, lamps, etc., in excellent condition; accept 44 gns.—Longman Bros., King St., Acton. [X9683]

## MOTOR CYCLES FOR SALE.

## Rudge.

1916 Rudge Multi. 3½ h.p. roadster, £58/15; two actually in stock; Canelet sporting and model B3 sidecars, with fittings to suit, in stock.—D. J. Shepherd and Co., Enfield Highway. [X15805]

RUDGE Multi, 1913, completely overhauled, new piston and clutch fitted and re-bushed last December, appearance good, engine as new; £50; owner in Flying Corps.—Barrett, c/o Jewell's Garage, 168, Archway Rd., Highgate. [X1723]

## Russell.

11 h.p. Russell, mag., fitted 1915 countershaft 2-speed, F.E., perfect order; £10/15, bargain.—Carson, Townhead, Eym, Sheffield. [X1599]

## Scott.

1912 (late) Scott, Canelet sidecar; any trial by appointment; £40; must sell.—29, Nelson Rd., Gillingham, Kent. [X1533]

SCOTT Motor Cycle and Sidecar, 1912, in perfect condition, with all accessories; £45.—Leslie, Hetherington, Bootham Grange, York. [X1746]

SCOTT, 2-stroke, 2-speed model, fitted with comfortable sidecar, the combination complete with all accessories; £33; guaranteed.—Wachope's, 9, Shoe Lane, London. [X1613]

## Singer.

1912 3½ h.p. Singer, perfect; £20, or exchange.—Wardle, Aberford Rd., Woodlesford, Leeds. [X1576]

4 h.p. Singer (cane sidecar), 1913½, 2-speed, countershaft, clutch, lamps, horn, speedometer; £38/10.—8, Olipstone Ave., Nottingham. [X1326]

SINGER, 4½ h.p., 2-speed countershaft, coachbuilt combination, F.E.S. head, Lucas rear, separate generators, Coway, horn, new Dunlop, extra heavy on back, original tyres on front and sidecar, spares—re-treaded extra heavy tyre, new tube, valve, tools, equal to new, mileage 3,700; cost 84 gns. August, 1914, £52, or nearest.—W. A. Williams, Builder, Caergarle, N. Wales. [X1573]

## Spur.

SPUR, 3 h.p., 2-stroke, 2-speed, 1916, just delivered; 54 gns.—Chris. K. Butt, Chapel Av., Bourton, Dorset. [X1423]

## Speed King.

1914 Speed-King-Jap, 2½ h.p., 2-speed, 23 gns.; generous easy terms.—Lamb, 151, High St., Watthamstow, and 50, High Rd., Wood Green. [X1626]

## Stevens.

STEVENS, 4 h.p., B. and B., spring forks, Fisher mag., countershaft 2-speed, separate clutch, Brooks, Clincher, Michelin.—C. Jennings, Sampford Peverell, Taver-ton. [X1495]

## Sun.

SUN-VILLIERS Lightweight, shop-soiled only; £28 to clear.—Slack's Garage, Stockport. [X1453]

SUN-VILLIERS, 2½ h.p., 1915, splendid machine; £22.—Colmore Depot, 31, Colmore Row, Birmingham. [X1859]

SUN, 1916, V.T.S., 2½ h.p., 2-speed, 2-stroke, latest brand new models, in stock; £37. Tel.: 388. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [X1667]

SUN 2-stroke.—All models from £30/10 to £37; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [X1854]

## Sunbeam.

SUNBEAM, 1916, 3½ h.p. model, just delivered.—Dominy, Jewry St., Winchester. [X1543]

SUNBEAMS, 70 gns.; can I quote you for yours in exchange?—Bunting, Wealdstone, Harrow. [X1657]

CONSULT Rex Mundy before purchasing a new or second-hand Sunbeam.—See "Consulting Engineers" column. [X1514]

SUNBEAM, 2½ h.p., in perfect condition, lamps, horn, speedometer; £36.—E. Stoner, Aylsham, Norfolk. [X1739]

SUNBEAM, 2½ h.p., 1913, 2-speed, kick starter, good tyres; £30.—27, Woodbridge Rd., Moseley, Warwickshire. [X1672]

1914 Sunbeam 6 h.p. Combination, in splendid condition, speedometer, Lucas lamps, horn, wind screen, exhaust whistle, etc.; £80.—Best, 1, Rupert Rd., Sheffield. [X1058]

## Swift.

SWIFT, 1912, 7.9 h.p., hood, screen, speedometer, watch, horn, lamps, complete, in new condition, perfect order; any trial; bargain, £55.—Hook, 441, Brighton Rd., Croydon. [X1594]

## T.D.C.

T.D.C. de Luxe, 2-stroke, 2-speed, new.—Marshall, Castle St., Cambridge. [X1555]

1915 De Luxe T.D.C., 2-stroke, accessories; £18.—143, Evington Rd., Leicester. [X1565]

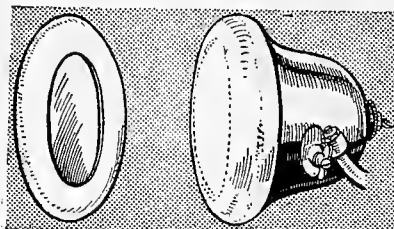
## Triumph.

1915 Triumph, 4 h.p., 3-speed, as new; £45.—A. Merrett, Corsham, Wilts. [X1678]

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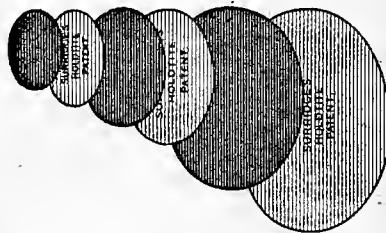
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## MOTOR CYCLES FOR SALE.

## Triumph.

1913 T.T. Roadster Triumph, 3-speed; £34.—Ross, 86, High Rd., Lee, S.E. [X1754]

1910 3½ h.p. Triumph, 2-speed, and sidecar; £23.—Wilkin, Hunter's Bar, Sheffield. [X1926]

LATE 1914 4 h.p. Triumph, nearly new tyres, lamps; £31.—Stoer, Aylsham, Norfolk. [X1738]

TRIUMPH, 1910, speedometer, lamps, good order; £21.—Martin, 6, High St., Highgate. [X1703]

1914 Triumph, 4 h.p., 3-speed, clutch; £38.—5, Laurence Pountney Hill, London, E.O. [X1610]

TRIUMPH, 1910, splendid condition, semi T.T. bars, lamp, horn; £20.—Elmleigh, Brackley. [X1507]

3 h.p. Triumph, splendid condition, tyres nearly new; £15.—Nicholl, 27, Raglan St., Halifax. [X1555]

TRIUMPH, 1908, 3½ h.p., N.S.U., new tyres, belt; £20.—51, Northcote Rd., Clapham Junction. [X1939]

1910 3½ h.p. Triumph, just overhauled, splendid condition; £18.—H. Wright, Arlesley, Beds. [X1688]

TRIUMPH, 1911, free engine, just overhauled, all accessories; £27.—Christie Bros., St. Andrews. [X1571]

TRIUMPH, late 1914, 4 h.p., T.T., £42; perfect throughout.—F. North, Boot Shop, Bourne, Lincs. [X1628]

TRIUMPH, 1912, 3½ h.p., free engine, new Dunlop, accessories; £26.—Oatlands, Windmill Rd., Brentford. [X1437]

CONSULT Rex Mundy before purchasing a new or second-hand Triumph.—See "Consulting Engineers" column. [X1515]

TRIUMPH, 3½ h.p., B. and B., Bosch, lamps, horn; bargain, £16.—97, Drayton Gardens, South Kensington. [X1937]

TRIUMPH, 1912, N.S.U., 2-speed gear, speedometer, lamps, splendid order; £28.—Martin, 6, High St., Highgate. [X1702]

1914 4 h.p. 3-speed Triumph and coachbuilt sidecar, lamps, and horn; £52.—Wilkin, Hunter's Bar, Sheffield. [X1825]

1 h.p. Triumph, 1910, accessories, splendid condition; £216 for quick sale.—436, Whitehorse Rd., Thornton Heath. [X1546]

1912 Triumph, free engine, lamp, horn, speedometer, good condition; £28.—Haycock, Gt. Glen, Leicestershire. [X1534]

TRIUMPH, 1912-13, 3-speed gear, clutch, nearly new tyres and belt, lamps, horn; £29.—110, High St., Willington, Durham. [X1608]

3 h.p. 1911 Standard Triumph, complete with all accessories; £22/10; guaranteed.—Wachope's, 9, Shoe Lane, London. [X1620]

TRIUMPH, 4 h.p., 1914; 3-speed, and clutch model, perfect condition, all accessories; £42/10.—Wild-gose, Lambourn, Berks. [X1553]

TRIUMPH, 1911, 3½ h.p., cane upholstered sidecar, accessories, splendid condition; £30.—Ayers, 21b, Emery St., Cambridge. [X1690]

TRIUMPH, 1909, 3½ h.p., 3-speed, sidecar, new combination tyre on back; £26.—Bell, R.E. Office, Bittacy Farm, Mill Hill. [X1788]

TRIUMPH, 3½ h.p., 1913 engine, 3-speed hub, lamps, speedometer, and sidecar; £35.—Hackett, 487, Hampshaw Lane, Stockport. [X1574]

1912 Triumph, clutch model, 3½ h.p., lamps, etc., £28; also 1913 clutch model, £29.—Newham, 223, Hammersmith Rd., W. [X1697]

1913½ Triumph, 3½ h.p., Armstrong 3-speed, Watsonian coachbuilt sidecar, excellent condition; £42.—31, High St., Acton. [X1717]

TRIUMPH, late 1911, T.T., very fast, in splendid condition, guaranteed perfect; £21.—27, Woodbridge Rd., Moseley, Warwickshire. [X1671]

1908 Triumph, in running order, new cylinder and Bosch mag. 1913, good Dunlop tyres, and belt nearly new; £7.—Rowe, Maryborough, Ireland. [X1789]

1913 3½ h.p. 3-speed Triumph, with Canelet coach-built sidecar; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [X1734]

TRIUMPH, 1911, 3½ h.p., N.S.U., 2-speed, adjustable pulley, new heavy Kempshall, engine excellent condition, fast machine; £24.—Adams, 19, Edgware Rd., W. [X1440]

TRIUMPH, 3-speed, bought 1911, new condition, horn, head, tail lamps, spares, 35 gns.; sidecar to fit, £4; any trial.—Froward, Heathurst, Vale, Hampstead. [X1729]

TRIUMPH, late 1913, 3-speed, Triumph lamp, horn, knee-grips, and all accessories, oversize tyres, perfect condition, little used; photo; £40.—P. Batten, Ashburton, Devon. [X1551]

1913 3½ h.p. 3-speed Triumph, and sidecar, free engine, clutch, new Dunlop belt, P. and H. lamps, horn, accessories, perfect condition; £38.—Essex, Milton, Cambridge. [X1603]

TRIUMPH, 1911, new Hutchinson front and back, whole in perfect condition; highest cash offer accepted; officer leaving for the Front.—Box No. 11, c/o The Motor Cycle. [X1068]

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## Sunday Events and Prohibition.

**T**HIS vexed question is once again revived by the unofficial organisation of Sunday hill-climbing expeditions referred to in our last issue. Since then we are happy to state our disapproval of Sunday events has been supported in many quarters, which, after all, is only as it should be. The sight of able-bodied men indulging in "sporting" events on Sundays, particularly in war time, cannot be commended, and we should not be surprised if the Auto Cycle Union, the governing body of motor cycling, were tempted to step in and denounce events of the kind. This is an age of prohibitions, and if the A.C.U. do not deal with the matter with a firm hand, it is quite within the bounds of possibility that the Government may go a step further and introduce a partial prohibition of private motoring. But quite apart from such a serious possibility, in the interests of the movement we must not allow motor cycling to be dragged down. It is a reflection upon the motoring community if Sunday competitions are indulged in by a small minority, who, we are perfectly ready to believe, have not paused to consider the matter from all its aspects. So far as *The Motor Cycle* is concerned, nothing will be done to assist in the organisation or support of Sunday competitions, but, as a journal publishing a complete history of the motor cycle movement, we are bound to refer to such events, much as we may object to them. Finally, we should like to make it clear that we do not for a moment suggest there is wrong in ordinary Sunday runs. Motor cyclists as a class are mostly folk of scanty leisure, and their only free time is usually at the week-ends. To deprive hard workers of a run into the fresh air of the countryside would be a foolish thing. What we deprecate is the noisy gathering collected at some hill, disturbing the peace of the day and generally turning Sunday into pandemonium by the use of freak gears and open throttles. Ask the villagers and

country residents generally what they think about it; and above all bear in mind that, numerous as we may be, we are in a minority. The non-motorists greatly outnumber the motorists, and it is only commonsense to avoid needlessly exciting the prejudices of the majority.

## Motor Taxes and the Budget.

**I**T is too early yet to talk with any degree of confidence of what the new Budget may bring forth, but there are already rumours to the effect that the tax on motor vehicles will be increased. This is surprising in view of the trials and tribulations through which the trade has already passed as the result of the entire dislocation of ordinary business channels created by the world conflict, but it is earnestly to be hoped that whatever increase is imposed, if any, it will only be tentative for the war period. After the war it will need the combined energies of politicians, business men, and engineers to regain for British trade its place in the world. Consequently any new taxation imposing hardships, which an already weakened industry is unable to bear successfully, might have very serious consequences. When the talk of increased taxes was general last October, it was confidently expected that owners of foreign-made motor vehicles would be treated on a different basis from others, but, instead, the Government in effect did owners of such vehicles a good turn, for the imposition of 33⅓% duty on future imports had the effect of raising the value of existing vehicles. As we have said, it is too early yet definitely to anticipate increases, and the Government is not likely to cripple unduly the British motor industry which has already suffered so much, and yet was able subsequently to render such valuable service to the country in the matter of munitions; but if increased taxation is to be imposed, then it is pertinent to ask whether owners of imported cars and motor cycles are to be taxed on the same basis as the more patriotic user who has kept his money in the country.



## An Unfortunate First Trip.

### SOME QUESTIONS OF PASSENGERS AND INSURANCE.

**A** CASE of some considerable interest as concerning both buyers and suppliers of motor cycles was reported in *The Motor Cycle* of the 3rd inst., where damages of £650 were awarded to a Mr. Gardner for injuries received while being driven home in a second-hand sidecar outfit he had purchased.

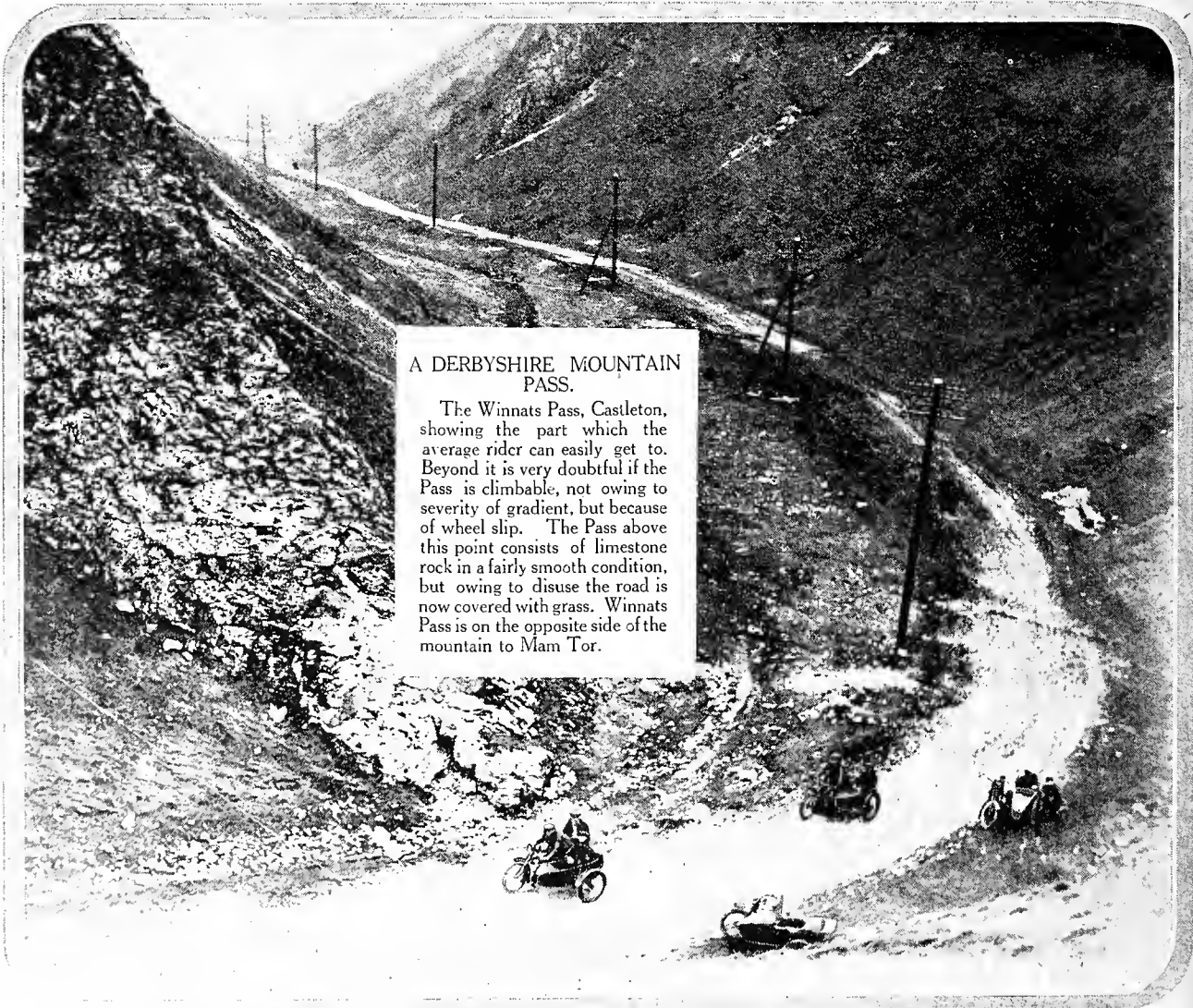
The first query that will probably arise in the average reader's mind will be as to whether the defendants had protected themselves with the usual proviso as to the driving of customers' cars or cycles being at customers' risk. Such a proviso, however, could not apply to cases of injury to clients who might be riding as passengers—as in the case in question—caused by negligent or wrongful acts on the part of the firm's drivers. It would not even cover cases of damage to the car, if negligence could be proved. All it reasonably can cover is unavoidable accident and the ordinary risks of the road. Nevertheless, had the

plaintiff been taking any part in driving at the time his position would have been very different, but, having relegated himself to the status of a passenger, he was protected by law, with the result already stated.

Thus one gets an important illustration of the great responsibility of a driver towards his passenger, and the illustration may well be applied to the ordinary conditions wherein a motor cyclist takes out a friend in the sidecar. He must remember that; in law, although he may be doing that friend a favour, or even an act of pure charity, in taking him out, he will be liable for damages should that friend meet with any injury which can legally be ascribed to negligence on the part of the motor cyclist. It is, therefore, important that this risk, which is so frequently incurred, should be covered by insurance, and riders of sidecar combinations should examine their policies carefully to see that they are properly covered in this respect.

#### A DERBYSHIRE MOUNTAIN PASS.

The Winnats Pass, Castleton, showing the part which the average rider can easily get to. Beyond it is very doubtful if the Pass is climbable, not owing to severity of gradient, but because of wheel slip. The Pass above this point consists of limestone rock in a fairly smooth condition, but owing to disuse the road is now covered with grass. Winnats Pass is on the opposite side of the mountain to Mam Tor.





### An Attempted Remedy.

Mr. Chas. Binks, of carburetter fame, has just brought out a new and interesting vaporiser for the babies. It is of the three-jet type, like his other carburetters, and it is fairly obvious that the multiple-jet principle should be specially beneficial for the little 'uns, as the smallest jet should ensure two-stroking at low speeds. This claim is borne out in practice, as my initial tests of the carburetter have proved; I put it on my James, and got improved starting and slow running before the best jet had been selected. This is, however, the least important of Mr. Binks's innovations. He is of opinion that few two-strokes atomise their petrol at all satisfactorily. Petrol can be vaporised by high velocity spraying or by heat. It is not easy to increase the velocity of the suction, but it is possible to apply increased heat to the gas. He began by pouring boiling water over the crank case of a Calthorpe two-stroke before starting, and found it of great value. Being a logical man, he perceived that the engine might stand increased heat even when it was warmed up. So he fitted a tin screen to fend head draughts off the crank case, and, instead of taking the carburetter air supply from the open and chilly air, he fitted a collector funnel round the silencer (the exhaust pipe or the cylinder would serve almost equally well), and coupled it to the main intake of the carburetter. The immediate results were a marked economy of fuel and improved steadiness of carburation under deceleration and acceleration. It is hardly fair of me to publish these facts, as the hot air supply and the screened crank case are experiments which any owner can make for a shilling or two; and as Mr. Binks is the first to imagine and prove their merit, he deserves more than empty kudos for his ideas. Where a long pipe has to be employed to conduct the warm air supply to the carburetter, it may be well to lag it with suitable material to keep the heat in. The disposition of the parts concerned on many machines implies a long and exposed pipe, which would be constantly chilled by head draughts. Mr. Binks ascribes the results obtained to the stoppage of condensation, due partly to the low velocity suction and partly to the inadequate temperature of the crank case. Has anybody made comparisons between the crank case temperature of four-strokes and two-strokes? I never noticed any appreciable difference, and suppose there is no danger of overheating the crank case so that an attenuated charge of mixture would be inhaled.

### Petrol Prices Investigation in U.S.A.

I know very little of the State's power of interfering with trusts and syndicates in America, but the U.S.A. appear to manage these things better than we do, to judge by a Washington *communiqué* in a New York motor cycling journal. According to this statement, the U.S.A. Department of Justice and Federal Trade Commission are making joint investigation into the recent rise in the retail price of petrol in the States

from 7d. per gallon to 10d. The grounds of their action are (1) that petrol exports were less in 1915 than in 1916, (2) that the reserve stocks in the hands of the controllers are greater than they have ever been, and (3) this last although the production for 1915 was purposely restricted for various reasons. The underlying justification of such action appears to be that the Government has a right to interfere when allied industries are hampered by an unnecessary and artificial rise in the price of a commodity, whether that rise be due to greed on the part of a combination of interests or of a single syndicate, *e.g.*, the firms controlling the supply of crude petroleum or the firms controlling refining plants, or both acting in unison. It is common knowledge that the tendency of American financiers to combine allied interests into monopolies and trusts has led to their Government taking a more active interest in prices and market rigging than European Governments have yet seen fit to do.

### And an English Defence.

I am not in a position to say that the above implications undermine in any way the defence put forward last week for British prices by a firm controlling much of the British supply. This defence dealt with factors largely extraneous to the American market, notably the cost of freight by tank steamers, the cost of distribution in England, and so forth, though the recent rise in American retail prices from 7d. to 10d. a gallon is faithfully reflected in British prices; the Shell people ask us to note that the lowest trade price for large consignments free on board at North American ports is now 10d. per gallon. If the U.S.A. Government compel a reduction in the American price it will be interesting to see if the British distributors drop their prices over here *pro rata*; they seem likely to have a chance, at any rate, of proving their *bona fides*, and we shall watch them closely. In the meantime it seems possible that amongst many industrial and commercial reforms which must follow the war some Government supervision of great monopolies may be demanded. For all practical purposes petrol is now a monopoly. It is largely controlled by closely associated concerns so far as the private user can gauge the situation, and the sole competition, until alcohol fuel is developed, arises from benzole. Even in peace time the supply of benzole was so limited in extent and so variable in quality that it exercised but the mildest influence on petrol prices; and now that the Government has commandeered the entire output of benzole for explosives the one weak modifying factor has disappeared. Such a variety of interests hinge on the price of petrol that the nation cannot afford to let any concern, however generously administered, monopolise the supplies; and the hint of Government action in the United States comes as a salutary safeguard and an inspiring example. The fact that petrol is pumped into tank steamers at American ports at 10d. per gallon, and yet costs us 2s. and

## Occasional Comments.—

upwards in this country, is an interesting sidelight on the expenses of transport, distribution, and profits. Judging by the Shell manifesto of the other week, *these expenses*, so far as Great Britain is concerned, *tot up to a minimum of 1s. 2d. per gallon*, which is astounding considering the scale on which the business is worked. If petrol cannot be cheapened we must certainly push benzole and alcohol for all they are worth. Economical motoring for the million will not stand fuel at more than 2s. per gallon.

## The Alleged World Shortage in Future.

The Shell people also offered a broad hint that the world would soon be faced with a grave shortage of petrol, unless the cracking processes of producing volatile spirit now applicable to heavy oils proved to be workable on a gigantic scale. I find the utmost difficulty in taking this statement seriously. One of my friends belongs to a romantic and little known profession. He is an oil explorer. I hear of him now from China, now from Peru; wherever he goes, he is trekking on practically virgin soil, facing the most thrilling dangers, and enduring the fiercest hardships, always in search of oil. In company, no doubt, with other men of like interests, he knows of innumerable oil fields which have never even been tapped, many of them, so far as can be judged, equal in wealth and output to those which now supply the world's markets. There are difficulties, of course: these virgin fields are not invariably situated on trunk railways, or within tram distance of great harbours; but they are workable, and the petrol market is remunerative enough, *pace* the

Shell manifesto, to justify considerable expenditure in roadmaking, pipe-laying, and the like. The Washington announcement contains no hint of a suggestion that the refiners are reducing output because the wells seem likely to become exhausted, that other wells do not exist, and that the trusts are wisely looking ahead, and saving us from the awful fate of going back to push bicycles and broughams and traps. The U.S.A. Government is evidently extremely suspicious that some of the American trusts are making hay while the sun shines. Though the noble self-restraint of certain importers is alleged to have inspired them to sell petrol to us at cost price last year, they made a seven figure profit on their total turnover. Frankly, I for one shall continue to suspend my judgment on all these excuses until more proved and solid facts are laid before me. At the moment my main feeling is that concerns which have no appreciable competition to fear, which buy millions of gallons annually in America at 10d. (I say "buy" because none of us know the exact relations between the vendors and purchasers in this instance), and which spend from 1s. 2d. to 1s. 4d. per gallon in working expenses, ought at once to reform their method and organisation.



## HILL-CLIMBING IN GLOUCESTERSHIRE.

(A fully illustrated report of this gathering, held on February 6th, appeared in our last issue.)

(Upper) 3½ h.p. horizontal twin Brough, ridden by Chidley, nearing the summit of Rising Sun Hill.

(Lower) W. Moore, on the new 4 h.p. all-chain drive Douglas, climbing the Nailsworth Ladder. The village which gives the hill its name can be seen in the valley below.

## PARAFFIN AS A FUEL.

Its Possibilities in View of the High Price of Petrol.

**Q**UESTIONS and discussions regarding the use of paraffin, neat or diluted with petrol, as a fuel for motor cycle engines appear from time to time in the pages of *The Motor Cycle*, especially when, as at present, a rise in the price of the more usual spirit has taken place. As the writer has carried out tests with paraffin over quite a considerable mileage and under varying conditions of load, country, and weather, his experiences of the use of paraffin are given herewith in the hope that other devotees of the pastime of motor cycling may have the benefit, if any is to be derived, from an enumeration of the results obtained.

Paraffin is chemically a first-cousin to petrol, both being obtained together in the crude petroleum that is the initial source of petroleum ether, motor spirit, paraffin, various lubricating oils, and finally greases, of which "vaseline" is a purified example. Power can be obtained by the combustion of any one of these several products if the practical problems of the supply and combustion of the fuel are solved by the use of correct mechanical and engineering methods. The whole trend of motor cycle engine, and especially carburetter, design has, however, been determined by the properties of the motor spirit which is generally used, a medium volatile liquid with a boiling point in the neighbourhood of 85° Centigrade, and popularly known by the name of "petrol," although, strictly speaking, this latter is a patent trade name, and should be really applied to the product of one firm only.

### Paraffin Alone.

Paraffin is so little removed in chemical and physical properties from petrol as to require little, if any, modification in most forms of carburettors. The Triumph carburetter (the old non-automatic type), in the use of which as a paraffin atomiser the writer has had most experience, requires no alteration or adjustment at all, and if the engine has been started on petrol and allowed to warm up, very little difference in the running on the level is noticeable when pure paraffin is the fuel used. Considerable knocking is, however, obtained on the slightest provocation on hills, and a prolonged climb results in real and evident overheating. Although the starting difficulty can be overcome by using a small auxiliary tank containing petrol, and a two-way tap and pipes connecting the carburetter to the paraffin and petrol supplies, whereby the first few hundred yards may be covered on petrol and the paraffin then switched on, it is nevertheless most emphatically to be stated that the use of pure paraffin alone is highly unsatisfactory with all makes of machines. The economy effected is more than counterbalanced by the deterioration of the engine, the dirtiness of the machine after a few miles, and the discomfort of driving, and excepting when the normal fuel has inadvertently been allowed to become exhausted, and resource to paraffin obtained from a wayside cottage is the only course in default of pushing, the employment of this fuel should be rigorously eschewed, unless, of course, it be decided to employ a specially constructed carburetter, which procedure is assumed to be beyond the intentions of the rider.

It is, however, when paraffin is thinned down by the addition of petrol that possibilities of economy appear. Using all different proportions of paraffin to petrol in the mixed fuel, the writer has found that equal parts of the two liquids give the best results where comfort and economy are considered together. When much more than 50% of paraffin is employed the objections found to the use of pure paraffin appear, while less than 50% of paraffin leads to too small an economy on the year's running to make the trouble worth while.

### An Equal Paraffin-petrol Mixture.

Speaking from first hand experience with the Triumph carburetter (old type), the following particulars may be given. No adjustment of the carburetter float is needed, and an injection of the fuel as mixed will always result in a comparatively easy start. Knocking on hills, although slightly more noticeable at times, is not excessive, and can always be overcome by slight retardation of the spark; fuel consumption is slightly improved in average country, and in a hilly country is about the same as with petrol. The only apparent objections to the use of the mixed fuel are the two following: Firstly, a tendency on the part of the carburetter to accumulate dust in dry weather (this can be obviated by totally enclosing the carburetter in a loosely fitting linen bag), and, secondly, the trouble of mixing the fuel (this can be carried out with little trouble by using a quart mug, alternately filled with paraffin and then with petrol, and poured direct into the tank).

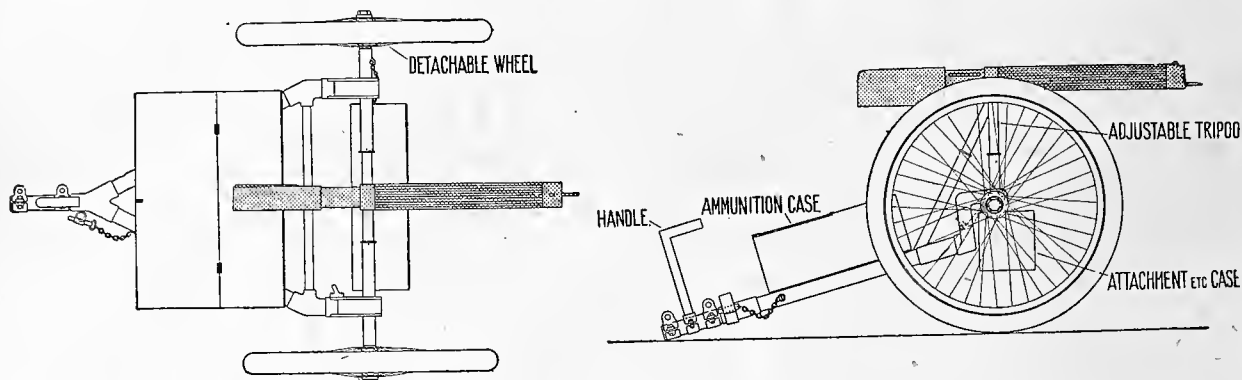
It may here be most strongly stated that no ultimate separation of the two liquids in the tank follows prolonged standing: paraffin and petrol are mutually soluble in each other to an infinite extent, and no amount of standing will ever result in the slightest increase in the proportion of the heavier fuel at the bottom of the tank. Increased wear in the bearings, owing to the paraffin oozing downwards past the piston rings and so diluting the lubricating oil in the crank case, has not been noticed, and, as a proof of this, it may be mentioned that the writer ran a 3½ h.p. three-speed Triumph with wicker sidecar and passenger for five thousand miles on half-and-half paraffin and petrol, and then for another five thousand miles with coach-built sidecar and passenger using petrol alone, before any rebushing was required. The bush wear during the first five thousand miles cannot, therefore, have been excessive. Excepting for a 3½ h.p. B.S.A. with B.S.A. carburetter that has been tried with one-third paraffin and two-thirds petrol with very similar results, no first-hand experience of the use of paraffin on other makes of motor cycles can be given, but the results should not be far different.

The economy effected by using the half-and-half mixture is not profound, but is noticeable with the usual 3½ h.p. Taking the price of paraffin as 10d. a gallon, and with petrol at 2s. 6d., a saving of about £5 15s. is obtained per annum if the distance covered in the year is ten thousand miles; with the lower yearly average of five thousand miles, the economy would be represented by half this sum. D. R. EDWARDES-KER.



## A Machine Gun Carriage.

Transporting the Gun Easily either by Hand or Attached to a Motor Cycle.



General design of the Rankin machine gun carrier.

**A**S everyone knows, machine gun sections are attached to all infantry regiments, and at present when the guns are transferred from one position to another they are carried by hand, which in many cases is a most fatiguing business. To overcome this, and also provide a means of rapid transport by attachment to a motor cycle, a special gun carriage has been designed and patented by two of our readers who are enthusiastic motor cyclists, viz., Messrs. W. Rankin and R. Player, of Messrs. Wrights Forge and Engineering Co., Ltd., Tipton, Staffs.

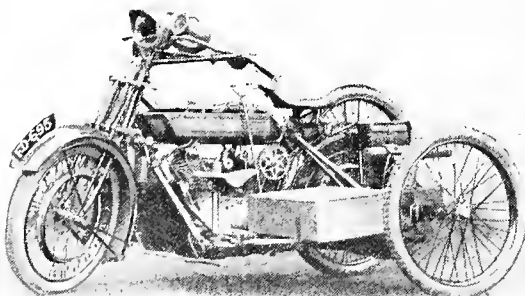
The carriage chassis is constructed of steel tube and is triangular in design. Two pneumatic-tyred wire wheels are fitted to an underslung axle, over which the machine gun is supported on a telescopic adjustable tripod by means of spring clips, which enable the gun to be quickly removed when required for use off the chassis.

### Attaches as a Sidecar.

In order that the carriage may be attached to a motor cycle for transport from place to place, one of the wheels is made quickly detachable, leaving a socket in the axle which provides the rear joint for attachment to the cycle. Two other adjustable connections are provided, which when not in use are

carried in a box situated under the axle. The wheel, when detached, is carried in any convenient position on the cycle. When attached to a motor cycle in this manner the outfit resembles the complete machines as at present used in the motor machine gun sections. The handle provided for drawing the carriage when detached from the cycle provides the support for the seat of the gun operator. A box designed to carry a large supply of ammunition is situated on the chassis in front of the gun. An experimental carriage has been built, and for testing purposes was fitted up with a dummy gun and loaded ammunition box, the total weight of which was the same as actual gun and ammunition. Test runs were carried out with the gun attached to a 6 h.p. Enfield, a passenger in the gunner's seat being carried throughout. The result, we are told, was quite satisfactory.

In reporting Italian trials and races we have referred to the desirability of British manufacturers cultivating the Italian market, especially as in the said competitions British machines have always done well. With export limitations on our trade owing to the war it is only natural that Americans should turn to Italy as elsewhere, and we now learn that an Italian dealer has taken over the four-cylinder Henderson agency.



The gun carrier patented by Mr. William Rankin and described on this page. The photographs show the experimental carriage, fitted to a 6 h.p. Enfield, with dummy gun and loaded ammunition box.

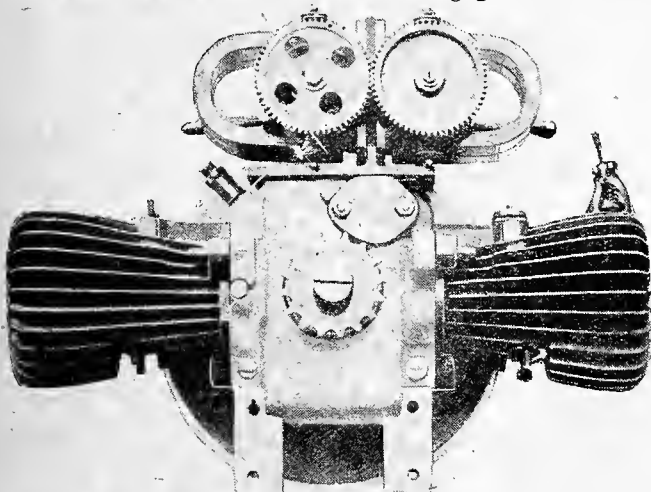
## Horizontally-opposed Twin Two-strokes.

### SOME EARLY EXAMPLES.

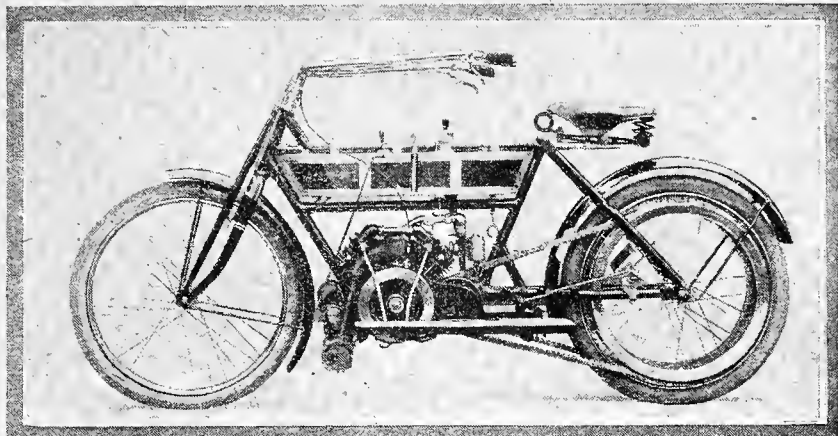
THE two-stroke horizontally-opposed twin-cylinder engine is by no means a new design. It was discussed in our "Correspondence" pages many years ago, some readers looking upon it as the ideal engine of the future. Many, however, had overlooked its outstanding defect in the matter of firing intervals; that is, when a two-throw crank is used and the pistons travel inwards and outwards together. This arrangement provides excellent mechanical balance, but the cylinders fire simultaneously, and are in this respect only the equal of a big single-cylinder. When a single crank is used and the cylinders are arranged to fire alternately, then the mechanical balance is upset, and one of the greatest attractions of the horizontal engine is negated.

#### A Fascinating Subject.

Whilst at Bristol recently we were discussing this subject with Mr. W. W. Douglas, and reminded him of a similar conversation we had two or three years ago at one of the Six Days Trials centres. During this first conversation, we were told that Messrs. Douglas Bros. had built a two-stroke horizontal engine on the lines of the present four-stroke Douglas and had found it wanting. In confirmation of this statement, Mr. Douglas promised to gather together the different parts of this engine—some of which had to be recovered from the scrap heap—and to rebuild the engine for us to see. We have since examined the engine and also the drawing from which it was made, the year it was constructed being given to us



When did the horizontal twin first two-stroke? A twin-cylinder two-stroke built by Douglas Bros. for experimental purposes in 1912. Two magnetos were geared together to obtain the simultaneous sparks.



A four-cylinder machine of 1907, and the first motor cycle to bear the name of Douglas. The cylinders are V-shape. Illustration from *The Motor Cycle* of Nov. 27th, 1907.

as 1912. So early was the engine that for the ignition two ordinary twin-cylinder Bosch magnetos had to be utilised. These were placed horizontally on the top of the crank case and were geared together. The engine itself was of the usual three-port type, crank case compression being utilised, and, in other respects, from the outside flywheel to the bore and stroke, viz., 60 x 60 mm., the engine was of standard type. The reason experiments were not continued, however, was on account of the fact that the firm came to the conclusion that a two-stroke engine having two separate cranks, i.e., cylinders firing together, was not so good in practice as it appeared on paper, and certainly was not equal to the performances of the 2¾ h.p. four-stroke Douglas.

As a matter of fact, Douglas history forms very interesting reading. Many of our older readers will recollect the Max motor bicycle being exhibited at the Stanley Show. It had tiny wheels and the rider stood on two footplates, no seat being provided. Mr. Douglas, even now, recalls with the greatest glee how he went buzzing along the tramlines of Kingswood on the first machine of this type which was produced, and how all the little boys ran after him yelling with delight—there was no difficulty in keeping up pace! The miniature Max had a single-cylinder engine made throughout in the Douglas works.

#### The Original Douglas a Four-cylinder.

The forerunner of the modern Douglas was the Fée horizontal twin, weighing about 70 lb., and a description of it appeared in *The Motor Cycle* of October 30th, 1905. Later it was transformed into the Fairy, on much more ambitious lines, until the Douglas, fitted with a magneto (which fitting practically rendered the machine a successful marketable proposition), made its *début*. The manner in which the Douglas came to the front by leaps and bounds by sheer merit is common knowledge. But it is not generally known that the first motor bicycle bearing the Douglas name had a four-cylinder "V" type air-cooled engine. Mr. Douglas, sen., reminded us of this fact in view of our recent article on the subject of four-cylinder motor cycles, and produced *The Motor Cycle* bound volume of 1907 in which an illustrated description appeared.

**Horizontally-opposed Twin Two-strokes.—**

Mr. W. W. Douglas went one further, and told us that this particular engine was for all the world like a modern Daimler aeroplane engine cut in half, and this fact had actually struck him a week or two ago when he enjoyed a flight on a Daimler-engined aeroplane.

**Other Early Models.**

To pursue further the origin of the horizontal twin-cylinder two-stroke, so far as *The Motor Cycle* is concerned, one of the first engines of this pattern to be made, illustrated, and described is one known as the M.I.P. This water-cooled engine was shown at the 1913 Olympia Show on the stand of the Cardan Cyclecar Co., and it was illustrated

in *The Motor Cycle* of November 27th, 1913. The engine was manufactured by G. Wailes and Co., and was intended for use on heavy sidecar outfits. The capacity was 496 c.c., and it had water-cooled cylinders. The pistons were of the trunk pattern, the bottom portion acting as the pumping piston, mixture being admitted to the cylinders *via* rotary valves.

Two other horizontal two-strokes, which were actually made and tested on the road about 1912 or 1913, were the production of a Mr. Murphy, of Birmingham, who recently showed us the two original experimental engines, both being of the pattern where even firing is obtained, but where the balance was imperfect. These engines are described and illustrated in another portion of this issue.

## A Good Soldering Outfit.

BY ROAD RIDER.

**A**NY tinsmith will tell you that amateur mechanics are seldom skilful with a soldering iron, and there is more than professional jealousy behind the assertion. A good deal of practice, coupled with some natural deftness, is essential to the production of good work with the ordinary iron, solder and flux. Clumsily soldered repairs disfigure a motor cycle. In these two facts must be sought the explanation of the fact that very few motor cyclists do their own soldering work. As garages are now suffering from a serious shortage of labour, I may do some readers a good turn by drawing their attention to the merits of the Tinol outfits, prefacing my remarks with the statement that a rider who has never attempted to solder in his life has just made a petrol pipe, complete with two coned unions, in my presence, and that the pipe would grace a Rolls-Royce. The Tinol outfits, which cost no more than a shilling or two, consist of a bijou petrol blow-lamp, telescopic soldering iron, and tin of paste; the paste contains both flux and solder, mixed together; the entire outfit can be carried in a jacket pocket. In operation it is simplicity itself, as may be gathered from a description of the two commonest soldering jobs which fall to the lot of motor cyclists; namely, re-fitting a petrol or oil pipe union and fitting a nipple to a Bowden wire.

**Fitting a Pipe Union.**

The end of the pipe is filed flat, so that it will butt squarely into the coned union, and the pipe is then burnished clean for an inch or so at the tip by holding it in a vice, and drawing a ribbon of emery paper to and fro around it. The coned union is then tested for fit on the pipe end; if it does not slide on easily there will be no room for a film of solder between the surfaces; if the pipe is on the large size for the union it can be thinned down by more sandpapering. Slip the nut down the pipe, making sure it is threaded on right way up. Anoint the pipe end all round with a thin layer of Tinol paste, applying it with a clean match or other improvised spreader. Slip the union into place. Direct the flame of the Tinol blow-lamp on to the coned union, and hold it there until a faint trickle of fused solder shows beneath the lower end of the coned union. Let the joint cool, and then

remove any trickles of surplus solder from the pipe by rubbing with the ribbon of sandpaper. For a smart effect re-burnish the entire pipe with sandpaper before remounting it on the machine. If the pipe needs bending to fit between tank and carburetter, it may usually be done cold, but, if at all hard, the pipe should be annealed by being heated to a red heat and then cooled by quenching in water; this will soften the metal.

**Attaching a Nipple to Bowden Wire.**

Bowden wire should always be soldered before it is cut to prevent unravelling, which weakens the wire, and renders threading awkward. Measure the length of wire required very carefully, and allow an extra quarter of an inch. Anoint this extra quarter of an inch with Tinol paste, and turn the blow-lamp on it till the paste fuses to the familiar silvery-white colour of running solder. Withdraw blow-lamp, let the soldered part cool, and cut the wire with the shears so as to leave, say, one-eighth of an inch of the soldered bit on the length intended for use. Take a nipple, and thread the wire through it, a task which the soldered tip will render easy. (If you had not soldered this tip, threading the wire through the nipple would have been much harder, and the wire would have been partly unravelled and weakened in the process.) Now cut the soldered bit  $\frac{1}{8}$  in. off with the shears—its work is done. Open out the strands of the new tip thus formed petal wise over the head of the nipple. Push the nipple down the wire, leaving the opened ends and the last half-inch of wire exposed. Anoint them with Tinol paste. Push the nipple back right up against the spread ends. Turn the blow-lamp on the nipple until you see the paste fuse with the ordinary appearance of running solder, then remove the blow-lamp and the joint will be perfectly made.

It is, in fact, an easy matter to effect any small repair by means of Tinol, in which it is possible to heat up the article itself by means of the blow-lamp, but if the flame is allowed to play on the solder itself it is likely to cause it to run into drops and fall off. In such a case it is better to use a soldering iron than a blow-lamp.

# MILITARY MOTOR CYCLING NOTES

## AMERICAN DESIGN FOR A MOTOR MACHINE GUN OUTFIT.

WE have already referred to the interest aroused in the United States in the part motor vehicles of all kinds are playing in the war, and it was only to be expected that sooner or later an American would turn his attention to a motor cycle machine gun outfit. As a matter of fact, sidecar outfits on somewhat similar lines to those of the British M.M.G.S. were

## COMPARISON BETWEEN RIDING IN FRANCE AND IN AN A.C.U. TRIAL.

WE have received a letter from E. M. Oliver, at one time secretary of the Purley and District M.C.C., and who represented that body on its A.C.U. committee, who is now a private in the M.T. section of the A.S.C. He writes: "Just recently I have had my photograph taken, and am sending you a copy to show you how I look after seventeen months of Army life, of which eleven

miles an hour, and out here one does not have to—in fact, were this the case, one could not get over the greasy *pavé*. The fact that there is no great hurry accounts for our seldom having dangerous falls, unless one is run over by a lorry before there is time to get up.

"Triumphs are doing good work out here. Douglasses abound, but a handle-bar clutch is really required to negotiate the greasy *pavé*. One day I am going to draw up a specification for a military machine; it will not have any levers; keeping one's fingers on the clutch and throttle levers creates the most fearful cramp."

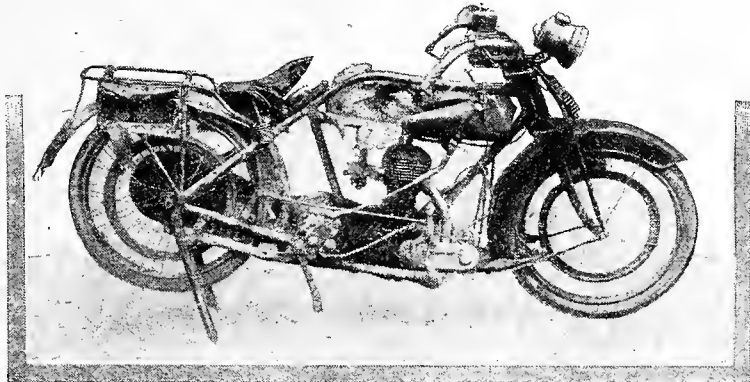
G. T. Gray, the former Rudge competition rider, who holds a commission in the R.E. and is training despatch riders. He joined the army upon the outbreak of war, and has already seen service abroad as an infantryman and motor cyclist despatch rider.



## RESULT OF SHELL FIRE ON A MOTOR CYCLE.

A PHOTOGRAPH on this page shows a B.S.A. motor cycle after being hit by a shell. It belonged to a despatch rider who, luckily, happened at the time to be in a house some yards away. The tank has been blown inside out, and the machine riddled completely except the front part, which suffered considerably less. The front tyre is not even punctured.

It seems a tragic coincidence that the previous rider of this machine was killed some few months ago—the only casualty his section has suffered during eleven months' service in France.



A B.S.A. machine after being struck by a shell.

A design for a motor cycle machine gun outfit. An American is responsible, but if he were acquainted with the road conditions in France and Flanders he would eschew motor bicycles with trailers.

built in the U.S.A. and attached to Indian machines some twelve months ago.

The type now illustrated is altogether different. According to our contemporary, *Motor Cycle Illustrated*, the machine gun carrier can be attached to either side of the bicycle, or towed as illustrated, the former being the normal one for travel. As illustrated, we are told, a rearguard action can be fought. As a matter of fact, it is doubtful whether a trailer would be practical under any conditions of fighting. In France a heavy, unstable machine towing a heavy trailer would be impossible owing to grease.

Arthur Chapple, the designer, is "dickering" (whatever that means) with representatives of several European war departments with regard to the adoption of his outfit, but, however much "dickering" he does, we do not think the Clyno Co. need have any fears!

## THE MILITARY CROSS.

We heartily congratulate Temp.-Lt. Cyril Patteson, R.E., on his being awarded the Military Cross. Patteson will be best remembered to our readers as a competition rider of Moto-Rèves.





E. M. Oliver, formerly a prominent official of the Purley and District M.C.C., who has seen seventeen months' active service. (See previous page.)

#### DESPATCH RIDERS' DIFFICULTIES IN SOUTH AFRICA.

**A**LTHOUGH the fighting in what was German South-west Africa has been a thing of the past for some time, information concerning the work of motor cycle despatch riders in that campaign has been so scant that a letter we have received from a reader, in Johannesburg, who took part in the campaign referred to, is of great interest.

Upon the outbreak of war Mr. G. F. Huskinson (the correspondent in question) was working as a civil engineer on the veldt near Somerset East, Eastern Province. He had been using in his work a 1913 model Douglas for eighteen months previously, and it had done splendidly under most severe conditions. In November, 1914, Huskinson joined the motor cycle despatch riders for the rebellion and G.S.W. campaign, taking the veldt-stained Douglas with him; his experiences as a military rider are best told in his own words:

"For the two months of the rebellion I was riding in rain the whole time. On several occasions I had to ford drifts

with the water well over the engine, and the only trouble during the whole time was choked mudguards—the front and the side flaps of the back one. I might mention that my machine was not the only one to give trouble in that respect. For our country roads out here in wet weather good mudguard clearance is essential.

"I participated in that great trek up the Swakop river which ended in the capture of Karib and Windhoek. From a motor cyclist's point of view it would be impossible to picture anything worse. I think you will be able to appreciate it when I tell you that all the riders, irrespective of the power of their machines, had to jump off and run alongside for the major portion of the way up the river bed, as the sand was so thick it was impossible for the machines to pull the riders through. Out of about sixty riders who started from Swakopmund only about twenty-five arrived at Karib with the brigades, the rest having broken down *en route*, and of the twenty-five only four did the journey without outside assistance such as towing or being carried, machines and all, in waggons."

#### NOVEL USE FOR MOTOR CYCLE ENGINES.

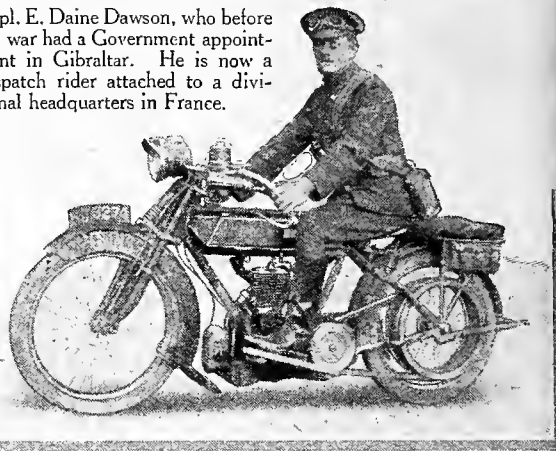
**P**ETTY-OFFICER FRED WRAY, attached to an R.N.A.S. armoured car section with the Mediterranean Forces, has sent us some interesting news concerning motor cycles in his section.

In one of the R.N.A.S. repair shops a Scott motor cycle engine has been adapted to drive a dynamo, which it does most successfully. The engine runs beautifully on a Douglas-Amac carburetter, and after being set at a certain speed, according to the ammeter reading, in the morning, keeps going all day. It is started by a crank engaging on an extension of the magneto shaft. The magneto is on a platform across the crank case, driven from engine sprocket, the other sprocket being replaced by a pulley, which drives

the dynamo. As the starting handle only gives a half-throw, to prevent fouling the carburetter, it speaks well for the Scott that two or three pulls always suffice to start up. Another Scott is used for driving a lathe.

Mr. Wray goes on to relate how in one country where they were quartered a Douglas inhaled so much dust and sand that the deposit on the pistons consisted of an oil and sand sludge. In fact, the engine "seized" owing to this on one

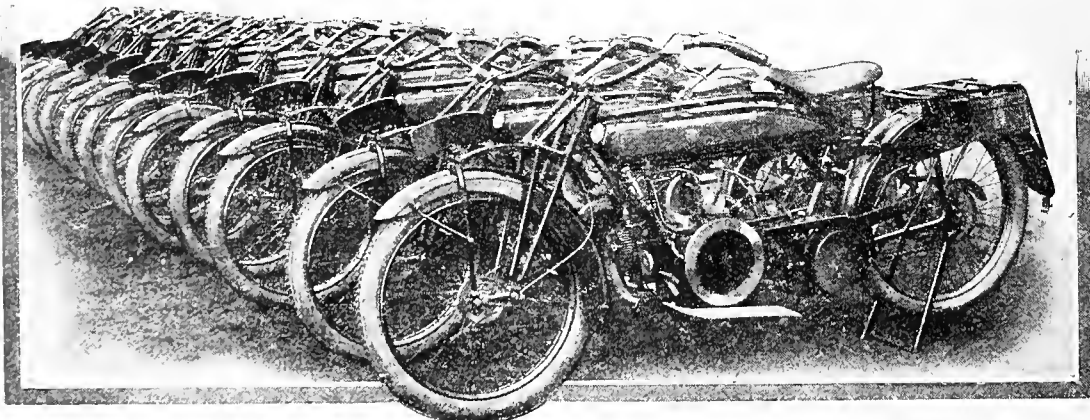
Cpl. E. Daine Dawson, who before the war had a Government appointment in Gibraltar. He is now a despatch rider attached to a divisional headquarters in France.



occasion. Another rider fell in a sand-drift, the machine falling on its side. When an attempt was made to start the engine it would not run properly, and investigation showed the induction pipe to be full of sand. In both these instances there was no gauze over the air intakes.

#### A.B.C.'s FOR EGYPT.

**W**E illustrate a batch of  $3\frac{1}{2}$  h.p. horizontal twin A.B.C. machines that have recently been despatched to Egypt to the order of the Egyptian Government. These machines are fitted with the new A.B.C. clutch, the size of which has been considerably increased and is now hand or foot controlled; mechanical lubrication with auxiliary hand pump, four-speed gear box, a new enclosed kick starter, and, of course, the well-known A.B.C. system of leaf springing fore and aft. The transmission has been improved by the fitting of a double "cush" drive.



A BATCH OF  $3\frac{1}{2}$  h.p. A.B.C. MACHINES FOR EGYPTIAN SERVICE.

# A TWO STROKE WIZARD'S WORKSHOP



• A COLLECTION OF DESIGNS •



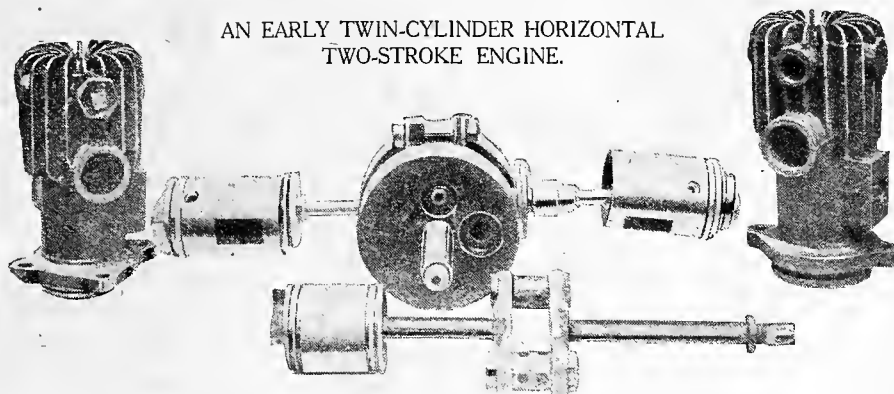
**A**LTHOUGH the origin of the two-stroke engine is so old, even more so than the four-stroke type, previous to 1908, when the Scott was first brought to the public notice, comparatively little was either thought of or known about the two-stroke. Since that time, however, makers and inventors have made a considerable study of this type, and during the last few years, especially the last two, great strides have been made in this direction. At different times practically every type of engine has been made on the two-stroke principle, including vertical twins, horizontal twins firing together or alternately, V twins with both even and uneven firing, engines with pumping cylinders, in addition to the well-known "baby" single-cylinder two-stroke.

When in Birmingham recently we were privileged to inspect a collection of different types of two-stroke engines which Mr. Murphy, of the Light Machine Co., the designer of the  $3\frac{1}{2}$  h.p. two-stroke Bullet engine, has been experimenting with for the past seven years, and all of which have run successfully on the road.

The present  $3\frac{1}{2}$  h.p. single, which has a bore and stroke of  $82 \times 89$  mm., has a number of points where it differs from the usual run of two-stroke engines, the chief being that it has inside flywheels instead of the usual outside one. The arrangement of the ports is somewhat novel, and tends to give a neat appearance, the carburettor being situated at the rear of the engine instead of at the side or front, as is usual. This is obtained by the inlet pipe passing through the transfer passage, which is, of course, situated at the rear of the cylinder, and is covered by a brass plate secured by four screws. Also the gas, when released from the top of the cylinder through the compression release valve, instead of

simply passing into the air, is conveyed down a small tube, through which it is impossible for flame to pass, to the transfer passage, whence it is again delivered to the cylinder. We are told that this results in a great saving of petrol where people drive on the

AN EARLY TWIN-CYLINDER HORIZONTAL TWO-STROKE ENGINE.

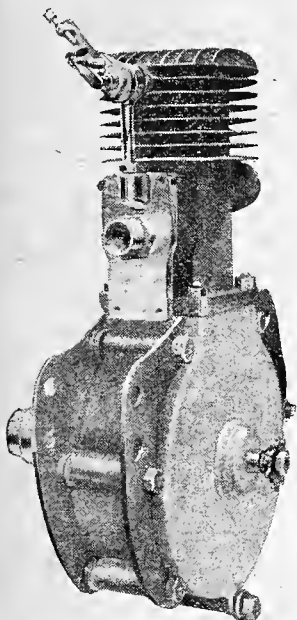


Parts of the first Bullet horizontal twin engine. This view shows the curious construction of crank and piston rods. The piston rod in the foreground is the earliest pattern where the piston was secured solid with the rod. The later pattern (above) has a gudgeon pin.

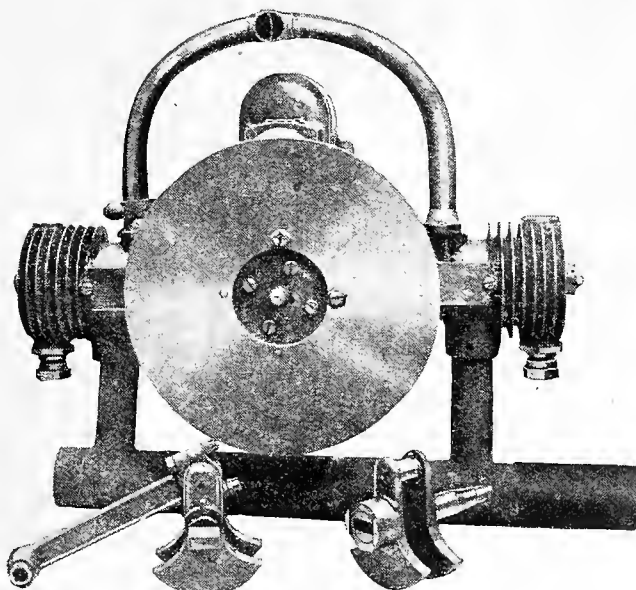
release valve, which is a very usual though undesirable practice on two-strokes. Roller bearings are fitted to the big end, the others being of phosphor bronze.

Mr. Murphy tells us that he usually runs his machine geared at  $3\frac{1}{2}$  to 1, a gear which the machine takes comfortably.

In addition to the  $3\frac{1}{2}$  h.p., which is itself a large engine for a two-stroke, a 6 h.p. single-cylinder two-stroke is also made. This engine has a bore and

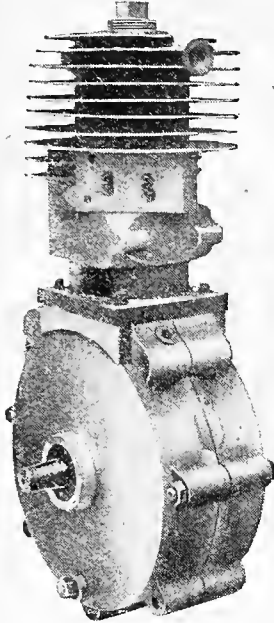


$3\frac{1}{2}$  h.p. Bullet engine, showing novel release valve, which transfers the released unexploded gas back to the transfer port. By this means much gas is saved when the release valve is used frequently.



A later model horizontal twin two-stroke Bullet. In front will be seen the construction of the crankshaft and the method of connecting the halves by dogs.

**An Interesting Collection of Experimental Two-stroke Engines.**—stroke of  $90 \times 104$  mm., and we are told that it has proved most satisfactory on test runs. The cylinder cooling flanges are of a very extensive character, and the engine we saw, after considerable use, showed no indications of having been over hot at any time. This engine also has inside flywheels.



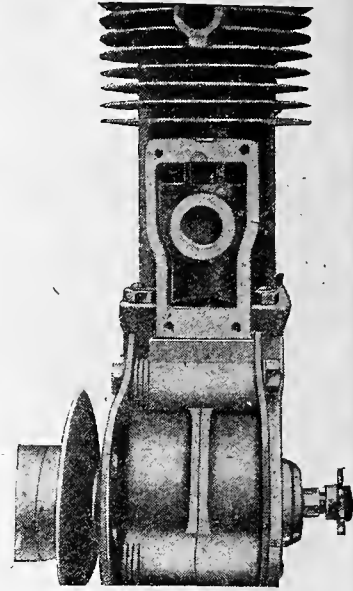
6 h.p. single-cylinder Bullet engine. The dimensions are  $90 \times 104$  mm. = 661 c.c.

Another type which Mr. Murphy has experimented with for a long time is the horizontally-opposed twin two-stroke, one model of which, he tells us, has proved most successful. The first of this type was made several years ago. In this engine the pistons were connected together by a solid rod, in the centre of which was a frame faced with hardened steel, which gave the necessary motion to the crankshaft. The pumping compression was obtained

between the bottom of each piston and glands situated in the ends of the crank case. Small inside flywheels were used on this model also. Alternate firing

was obtained, but the balance of the piston movement was by no means perfect, as both pistons travelled together. The engine, however, gave quite good results at speeds in excess of 25 m.p.h.

Just prior to the war Mr. Murphy was busy on another horizontal engine with cylinders of  $60 \times 60$  mm. In this model the crank case was divided into two separate compartments by a webbing, and the cylinders were somewhat staggered, so forming practically two separate engines. The crankshaft was decidedly novel, each half being made separate, and connected together when assembled in their respective crank cases by means of dogs. It was, therefore, possible to have any desired crank setting, and make the cylinders



$3\frac{1}{2}$  h.p. single-cylinder Bullet engine, with a bore and stroke of  $82$  mm.  $\times$   $89$  mm., showing the arrangement of transfer and inlet ports, both situated at rear of cylinder.

alternate firing, however, was adopted, and the engine covered many miles, giving most excellent results.

## Cattle on the Road after Dark.

**R**ECENTLY one of our contributors was returning from Leeds after nightfall on a Sunbeam sidecar outfit when, about two miles from that city, a large herd of cattle was encountered. Both drovers were at the rear of the herd, but fortunately the driver of the machine was able to pull up in time to avoid collision. The cattle, however, were attracted by the head lamp of the motor cycle, and though both driver and passenger shouted and waved, there was no turning the half-dazed creatures aside. Evidently they could see nothing beyond the lamp, for they crashed into the stationary machine, trampling over the sidecar and totally wrecking it.

By a miracle both passenger and rider escaped uninjured, and an hour or two later they reached home on the motor cycle, which was none the worse, leaving the much-battered sidecar near the scene of the accident.

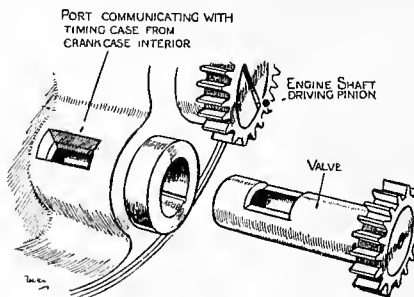
Things might have been very much worse, however, and the fact that the cattle, dazed and attracted by the light, actually ran straight into the stationary machine should act as a warning to others that on these occasions it is not sufficient merely to

pull up and wait. The safest plan is to shield the lamp with one hand till danger is past, for the glare seems to have an almost hypnotic effect upon animals unaccustomed to traffic.

It is certainly time orders were enforced with regard to the drovers of sheep and cattle being equipped with lanterns, to be carried both in front of and behind the herd. The accident occurred in a district where there are no lighting restrictions, but where these prevail the danger is much greater. Sheep are particularly invisible: when meeting a

flock it is sometimes possible for the driver of a car or cycle to distinguish the shining of the animals' eyes in time to pull up, but when overtaking a flock the animals harmonise exactly with the roadway, and collision is almost inevitable.

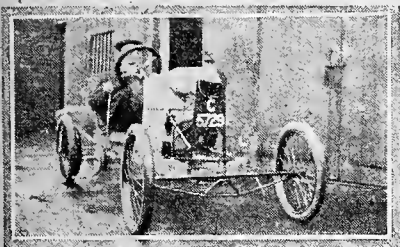
Many serious accidents have recently occurred through the presence of livestock on the road after fall of darkness, and it is to be hoped steps will be taken to bring this matter into accordance with the present lighting regulations, for it is certainly time that this and similar anomalies were removed.



Mechanically-operated crank-case air release valve on the Harley-Davidson. The valve opens and shuts on the crank case compression and suction strokes respectively, and is driven from the engine mainshaft by gearing.

## A HOME-MADE RUNABOUT.

O. N. is the name of a home-made cycle car built by O. B. Newbould, Rawmarsh, Yorks. It is fitted with an 8 h.p. J.A.P. engine, B. and B. carburetter, belt drive, and variable gear. The petrol is carried in a tank above the engine, and the oil in a small tank on the footboard near the driver's right hand. The frame is

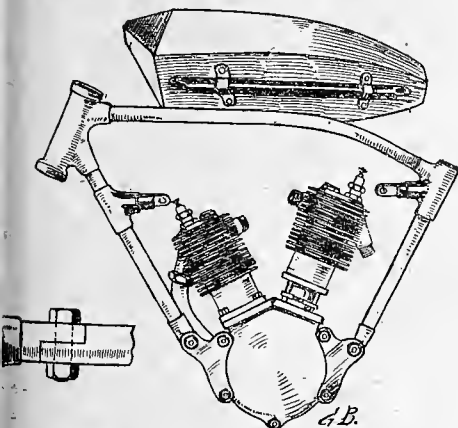


Belt-driven four-wheeler built by a Yorkshire reader and described in the accompanying letterpress.

constructed of hard wood, strengthened with steel flitches and angle plates. The body is grey, lined with black, and has a very sporting appearance. The principal dimensions are as follow: Track 3ft. 6in., wheelbase 7ft., ground clearance 6in., overall length 9ft. and width 4ft., tyres 650 x 65 mm. The illustration shows the machine in its early stages of construction.

## REMOVAL OF CYLINDERS.

OWING to the high ground clearance provided on American motor cycles, the cylinders come so near to the underside of the tank that it is difficult, if not impossible, to remove them without taking



Tank and tube detached and cylinder being removed. Note method of making joint.

the engine from the frame. To facilitate the removal of the cylinders, Mr. Frank A. Etwell, of Toronto, Ontario, has designed and patented a motor cycle frame. In this the lower horizontal tube, to which the tank is secured, is made detachable by the withdrawal of two bolts. The tank and tube are then lifted bodily out, leaving a clear space and giving easy access to the cylinders.

## PLUGS AND THEIR WEAKNESSES.

FREQUENTLY we receive for testing purposes sparking plugs of different manufacturers. We recently had three such plugs tested on the J.A.P. Works test bench. Two of these were expensive plugs of the single point variety, obtainable by the public at about 5s. each. One of them would not stand up under load, and the central electrode overheated and bent over, touching the side electrodes, in spite of being straightened twice. This was a plug which has only recently been placed on the market.

The other, the name of which we will not mention, but if we could do so it would be well known to our readers, stood up for two and a half minutes, after which the electrode bent over and the porcelain fractured.

The third plug, which, like the others, is of British manufacture, but is quite a cheap article, being sold at 1s. 3d., stood up very well under the brake test, but rather quickly oiled up, and shorting took place owing to there being not quite sufficient clearance between the porcelain and the body of the plug.

## SURRIDGE ACCESSORIES.

THE Surridge repair outfit is somewhat of a departure from the standard. With it is supplied a very neat little scratch brush for roughening the tube before applying the patch; a tube of solution, which carries the precious liquid quite safely and cannot be damaged; and also a brush for the application thereof. Numerous Holdtite patches are supplied, as well as a small box containing French chalk and valve tubes.

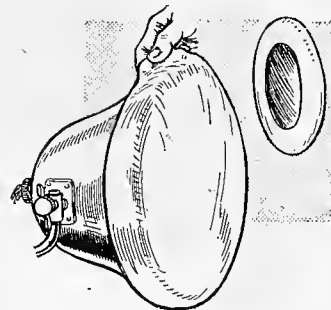
Our contributor "Road Rider" recently wrote an article on tyre repairs which led to a controversy about the most reliable methods of dealing with large gashes. Mr. R. Surridge, the patentee of the well-known Holdtite patches and solution, has sent us a sample repair of a huge longitudinal gash in an inner tube, and we are bound to say that all attempts to loosen the patch or extend the gash have failed, though both petrol and pliers have been employed in various attempts.

The most recent addition to the numerous Surridge rubber accessories is a



Surridge's latest repair outfit.

front glass dimmer, constructed of india-rubber, and intended to be placed over the glass in the manner shown in the accompanying illustration. It adequately



Surridge's rubber lamp dimmer.

dims the light, and also has the advantage of making the joint between the front and the lamp watertight and dustproof.

## THE LATEST LODGE PLUG.

## A Special Design for High-compression Engines.

IN addition to the special plug for two-strokes which we described in our issue of December 23rd, Messrs. the Lodge Sparking Plug Co. have now placed on the market yet another model somewhat on the same lines, but which is intended for use on racing or aero engines, or on machines where considerable heat and pressure exist.

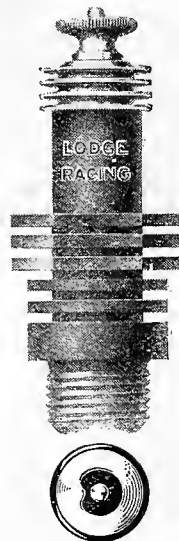
The chief point about this plug is that it is designed specially so as to carry away the heat generated by this type of engine from the electrodes and insulator in as short a time as possible, and so reduce to a minimum any tendency to pre-ignite the charge or damage the insulation.

For this purpose it will be seen that the body is deeply corrugated in the form of radiating fins, while the brass terminal end of the central electrode is also grooved in order to expose a large surface to the air for cooling purposes.

The insulator is composed of mica prepared under a special process. The electrodes, which are made of nickel and form a single gap, are the same as those used in the special two-stroke model. The central one is simply a straight rod, while the other is in the form of a disc with a hole in the centre, a protuberance on this washer forming the second point.

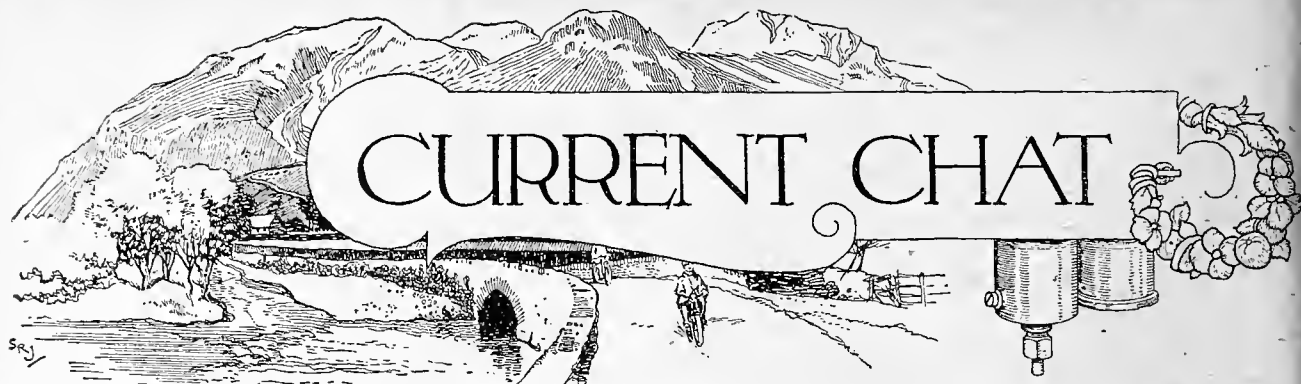
The fact that these plugs have a high electrical capacity causes them to give a most effective spark.

The plug is finished in black, and sells at 7s. 6d.



The Lodge racing plug, which has radiating fins.





### TIME TO LIGHT LAMPS.

	GREENWICH TIME	
Feb. 17th	...	5.43 p.m.
" 19th	...	5.47 "
" 21st	...	5.51 "
" 23rd	...	5.55 "

### Motor Cycle Volunteers for Blackpool.

A motor cycle section is to be added to the Blackpool branch of the National Motor Volunteers.

### Motor Cycles in London.

During the quarter ending December 31st, 1915, the London County Council granted 11,705 driving licences and 998 motor cycles were registered.

### Lights on Sidecars.

The desirability of a general rule in the matter of lights on sidecars has often been urged in our columns. It has often seemed to us absurd that regulations of this kind should be left to local byelaws, and that what is necessary in one county may not be required in the next. Many motor cyclists put a light on the sidecar for their own convenience and safety, although it may not be a legal necessity in the district where they live, and we should advise all our readers to do so.

The following is a case in point. The driver of a sidecar outfit (4ft. 6in. wide) was proceeding along a narrow road (14ft. 9in.) on a dark and rainy night. There he met a traction engine (7ft. 10in. wide), which occupied the middle of the road and allowed only 3ft. 6in. for any traffic to pass. When the driver of the latter saw a light approaching, which he took to be that of a motor bicycle, he stopped his engine, but made no effort to draw to his proper side, nor did he attempt to give any warning. The traction engine lights consisted of two lamps 2ft. apart, hung from the axle, and it was not until the sidecar was within eight yards that its driver saw the nature of the obstruction. He then ran his sidecar wheel into the bank, and sustained some minor injuries. When he brought an action for damages at Hawick, the case was given against him, on the ground of contributory negligence, although it was found that the driver of the traction engine was in fault, this contributory negligence consisting of the fact that he had not a separate sidecar lamp, which would have indicated the width of his vehicle, in spite of such a lamp not being required by the byelaws of Selkirk, the county in which the accident took place.

### Flashlight Traps at Bromley.

Employing pocket flash lamps, police are said to be timing motorists up to 8 p.m. on the London Road entering Bromley. Several local motor cyclists and despatch riders have been stopped. As many pedestrians in darkened streets are using flash lamps, mistakes might easily happen.

### Police Activity in the Metropolitan Area.

Trapping is at present more prevalent in the extensive district known as the Metropolitan area than it ever has been. The police, we are informed, are instructed to work their controls at least two days a week, and motorists are more frequently than before prosecuted under Section I. (i.e. driving to the common danger). As much activity is shown in the parks as in the streets, and consequently the greatest caution should be displayed. The Metropolitan police area comprises much open country, and so it is advisable never to exceed the twenty miles per hour speed limit by more than a very narrow margin immediately outside town, and to adhere to it strictly in London itself.



### EX-TOURIST TROPHY RACERS.

G. Boyton, the Irish motor cyclist, now a lieutenant in the R.F.C. after many months' despatch riding, chatting with G. E. Stanley, the well-known record-holder on Singer and Triumph machines.

### SPECIAL FEATURES.

#### SOME NOVEL TWO-STROKE ENGINES

(Illustrated).

#### NEW DESIGNS.

### British Material in American Machines.

It is stated in America that the price of motor cycles there is likely to rise slightly owing to the fact that a great deal of the tubing comes from England, and now that so many of the factories are working entirely on munitions this is very difficult to procure.

### The A.C.U. Secretary.

Mr. T. W. Loughborough, secretary of the Auto Cycle Union, who was promoted to the rank of captain in the Queen's for services rendered during the South African war, is now second in command of the 2/1 (Croydon) Surrey V.T.C.

### Daylight at Last!

"I would very much rather see a man summoned for dangerous driving at five miles an hour across the entrance to some public building, such as a railway station," said Mr. Hopkins, the Bow Street magistrate, the other day, "than I would see police sent from Scotland Yard to set a trap in a place which they know will be quiet, and where motorists are likely to be going at a high speed." We commend Mr. Hopkins for this sensible and opportune expression of an opinion which *The Motor Cycle*, among others, has urged for years past.

### The M.C.C. Opening Run.

It has been definitely decided to hold an opening run of the Motor Cycling Club this year, and the date chosen is April 1st. Dinner will be served at the Old Ship Hotel, Brighton, at seven o'clock, and the president, Mr. Charles Jarrott, will occupy the chair. Mr. W. H. Wells, captain of the club, will be pleased to hear from all members who can attend, and will be grateful if they will write to him at 366, Euston Road, N.W., stating what accommodation they require for the night. Free garage accommodation will be provided for members of the club staying at the hotel or for dinner only, provided their names are handed in to the proprietors one day in advance. Mr. Wells hopes that all members of the club who can possibly attend this event will make an effort to do so. Friends of members, especially ladies, may be assured of a hearty welcome.



CLIMBING MAM TOR, NEAR CASTLETON, WITH FIVE PASSENGERS.

G. W. Wilkin driving a 2½ h.p. Levis lightweight sidecar outfit up this Derbyshire ascent last week end. It was one of the test hills in the A.C.U. One Day Spring Trial of 1914.

#### When Did the Horizontal Twin First Two-stroke?

Considerable interest has been aroused of late in the horizontal twin-cylinder two-stroke machine. Several manufacturers are now turning their attention to this type of engine, but as two articles in this issue show, examples were built for experimental purposes by one or two firms several years ago.

#### Expensive Ignorance of a Special Constable.

Percy Calderbank, an engineer and special constable of Wallingford, has been fined £10, or a month's imprisonment, at High Wycombe for having a movable lamp on a motor cycle. Defendant pleaded ignorance, but the Bench described it as amazing, and imposed the fine stated and ordered the lamp to be confiscated.

#### Further Hill-climbing in the Peak.

G. W. Wilkin, with a 2½ h.p. Levis and sidecar, gave another graphic hill-climbing performance at the week-end. In our last issue we chronicled his ascent of the Derbyshire hills Mam Tor and Sir William with three passengers. On Sunday he climbed the former with five passengers. A strong gale was blowing down the hill, but Wilkin managed to reach the top successfully with his big load. The Levis was geared 7 and 14 to 1. On some of the corners the wind was so strong that riders on high-powered machines were brought to a temporary standstill. There were approximately 200 to 250 motorists present to witness the climb. They had made the journey to Castleton on all kinds of motor vehicles.

#### The National War Funds.

At the week-end the principal war funds stood as follow:

The Prince of Wales's National Relief Fund (£2,978,000 distributed)	£5,747,218	0	0
Fund for the Sick and Wounded	3,324,534	0	0
Tobacco Fund	99,513	0	0
The Queen's Work for Women Fund	168,436	0	0
The Belgian Relief Fund	1,321,770	15	10

#### January Imports of Petrol.

Just at present the amount of petrol imported into this country is of more than usual interest. The following are the figures for January of this and the two preceding years:

Jan., 1916	6,985,276	galls.
" 1915	6,984,339	"
" 1914	9,487,091	"

According to the Board of Trade returns, duty has been paid on 9,175,909 gallons during the month ending January 31st last.

#### A Two-stroke Exponent.

Last week we had the pleasure of a visit from Mr. Frank Philipp, whose name is well known in connection with the Scott machine, by reason of his many exploits on that make. Mr. Philipp is not now engaged in the motor cycle industry, but at present holds an important position with Messrs. Thwaites Bros., general engineers, Bradford, whose speciality is cast steel road wheels for motor lorries. It is interesting to note that at least 75% of this trade was formerly in the hands of the Germans, and Messrs. Thwaites are reaping the benefit now that enemy supplies have been cut off. Our talk with Mr. Philipp naturally revived many pleasant memories

of competitions of the past. We competed in spirit in the T.T., imagined ourselves climbing Sutton Bank, and later dodging boulders up the different freak hills included in the various Six Days Trials. To keen motor cyclists it was like music in one's ears to talk of these happy competition days.

#### Ford Stories.

An intensely amusing series of Ford yarns will appear in our next issue, the result of a paragraph in these columns.

#### New Club Officials.

At a meeting of the Birmingham M.C.C. the following were elected as executive officers for 1916: Captain, R. W. Duke; vice-captains, T. Silver and S. Rodway; hon. trials secretaries, S. Rodway and W. H. Egginton; hon. secretaries, R. V. C. Brook and S. C. Perryman. As it is hoped to be able to revive the work of the club to some extent during 1916, it was unanimously decided not to reduce the present small annual subscriptions.

#### Patents in South Africa.

Mr. Benjamin T. King, A.I.M.E., informs us that a Bill dealing with patents in South Africa has been introduced in Parliament. Under this Act, which may be expected to come into force about the middle of this year, a patent will include the whole of the Union, viz., Cape Colony, Natal, Transvaal, and Orange Free State. This will mean a considerable saving in cost and simplification in procedure, and British patentees and manufacturers should take steps to avail themselves of the privileges thus afforded.

## The Starley Front Fork.

A Newly-designed Spring Fork in which Brazed Joints are Reduced to a Minimum.

**T**HE subject of spring forks is of more than usual interest just now. Reports reach us from time to time of failures to this vital part of some machines ridden by despatch riders in Flanders and elsewhere. Naturally, their machines are subjected to very much greater strains even than in a strenuous British trial.

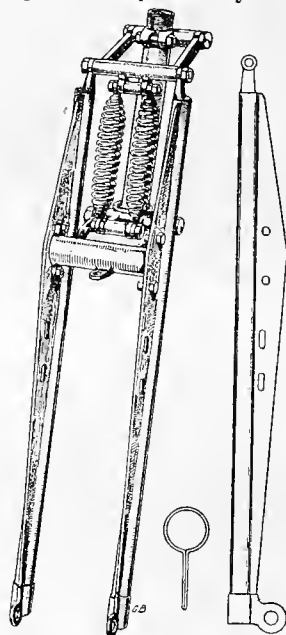
Mr. W. Starley, who is known as a prolific inventor and patentee, showed us last week a new fork in which brazed joints are practically absent. The average front fork of the braced or reinforced type is built up of steel tubing and lugs. This entails sixteen brazings, each of which necessitates the tube being heated to a very high temperature to enable the brass solder to run and make a perfect joint. Each time the tube is heated in this way scale is thrown off both inside and outside, which destroys to some extent the strength of the metal, and in making forks and building frames of motor cycles a thicker gauge of tubing has to be used to allow for this. In the case of a front fork of the ordinary type, it has to be heated many times before it is finally finished and ready for filing up and polishing, and unless great skill is used in brazing, and also in the filing up, breakages may occur in the tubing at the points where the lugs terminate.

### The Method of Construction.

Mr. Starley has patented an original design of fork blade in which ordinary round or oval weldless steel tubing is eliminated. He first takes a flat sheet of steel, and by means of proper tools this is folded into shape, which in section is something like the letter "O" with a long tail. Reference to our illustration will show the shape of this section, which is very strong both laterally and longitudinally. If one were to take an ordinary flat piece of steel and fold it around a handle-bar in the form of a clip, and then electrically weld the two flat strips together at the top of the joint, one would have the section employed in the Starley fork. No reference has been made so far to any duplication of the blades, as we will call them, for the simple reason that the girder arrangement is dispensed with and the fork blade is single, yet it is quite as strong as, or stronger than, the double type. The fork ends are also made out of flat steel folded to shape and pierced and brazed to the blades. Brazing is eliminated at the bridge piece by bolting it to the flat section of the blade through which holes or slots can be made at any point desired for the attachment not only of the bridge, but also brake guides, spring holders, etc. The lugs at the top of the blades are also brazed in, and these four brazings are the only ones employed in the making up of the fork.

Our sketch depicts the fork with the flat section pointing in the direction in which the machine is travelling, but it can be just as easily turned round so that the circular part faces forward. We know that some riders are very much prejudiced against a fork where single

blades are employed; they regard the duplex type as being, if not unbreakable, at least so safe that in the event of a breakage to a blade the safety tube would hold up the machine long enough to enable a dismount before a collapse. Strictly speaking, it is somewhat of a fallacy, because if it becomes a question of depending on a single tube, the one which passes through the steering socket is single, although of tremendous strength. To our mind the Starley fork, made up in the special way described,



The new Starley front fork, in which brazing is practically eliminated. The right-hand sketch is a broadside view, showing that the circular portion may face forwards if desired.

is not only lighter, but, if anything, stronger than the double tubular brazed type; it should be cheaper to produce, and is certainly quite as elegant in appearance as any of the brazed type already employed.

It is the patentee's idea that any makers who take up his fork would use their own method of springing and lubrication of the shackle pins. A neat method of providing horizontal action for the fork is the subject of a separate patent.

### Another Useful Invention.

Incidentally, in connection with Mr. Starley's bent, which is inventing, it may be interesting to point out that he was the patentee in 1892 of the tubular tricycle axle, and the French rights were sold by him to M. Clement of Paris for use on motor cars. When describing this fork Mr. Starley mentioned that the idea of the tubular back axle came to him in the train between Milan and Turin. He had considerable difficulty at the time in producing tricycle back axles with four separate bearings under a

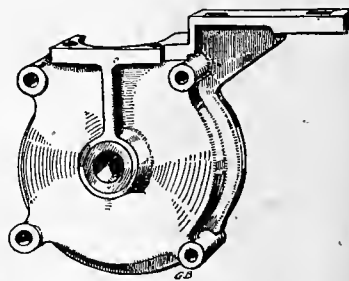
bridge, and eventually gave it up because it was practically impossible to keep the four bearings in line, and there was also considerable difficulty in keeping the grease from working out. Then it suddenly occurred to him, in the train, that the back axle could be made by joining two ordinary bicycle steering sockets together with ball bearings at each end, and the result was the tubular axle as we know it to-day on most cars, formerly made under royalty by many firms, but the patent rights have now expired.

### EXTENSION OF THE LIGHTING RESTRICTIONS.

**I**T was officially announced last week that, commencing to-day (February 16th), Part II. of the Lights (Vehicles) Order of December 15th last would be extended to the following districts:

Counties.	Areas.
BUCKINGHAM . .	Aylesbury (Urban District). Eton (Urban District).
CHESHIRE . . .	Chester (County Borough). Dukinfield (Borough). Hyde (Borough). Macclesfield (Borough). Stalybridge (Borough).
DERBY . . . .	Derby (County Borough).
GLOUCESTER . .	Bristol (County Borough). Cheltenham (Borough). Gloucester (County Borough).
LANCASHIRE . .	Accrington (Borough). Ashton-under-Lyne (Borough). Blackburn (County Borough). Bolton (County Borough). Burnley (County Borough). Bury (County Borough). Nelson (Borough). Preston (County Borough). Oldham (County Borough). Rochdale (County Borough). St. Helens (County Borough). Warrington (County Borough). Wigan (County Borough).
OXFORD . . . .	Oxford (County Borough).
SALOP . . . .	Shrewsbury (Borough).
STAFFORD . . .	Burton-on-Trent (County Borough). Lichfield (Borough). Stafford (Borough). Stoke-on-Trent (County Borough). Walsall (County Borough). Wednesbury (Borough). Wolverhampton (County Borough).
WORCESTER . .	Dudley (County Borough). Kidderminster (Borough). Worcester (County Borough).
YORKSHIRE . .	Barnsley (County Borough). (West Riding)

In districts covered by Part II. motor cyclists are allowed lamps up to 12 c.p., but with front glasses not exceeding 6in. in diameter and dimmed by at least one thickness of ordinary white tissue paper, paint, ground glass, or a disc of some other uncoloured material.



Half crank case and magneto platform casting of the Radco (see page 165).

## "THE MOTOR CYCLE" RECRUITING SECTION.

### RECRUITING FOR THE R.F.C.

WE are officially informed that sufficient motor cyclists have now been obtained for the Royal Flying Corps, but vacancies still exist for men with qualifications in the R.F.C. Trades. Vacancies which particularly interest our readers include motor transport drivers, motor cycle fitters, and engine fitters. The pay is 2s. per day in each case.

### THE MOTOR MACHINE GUN SERVICE.

IN response to enquiries, there are still no vacancies for despatch riders or motor cyclists in the Motor Machine Gun Service, but as regards the latter service there are batteries at present fully equipped at the training centre which will be proceeding overseas at a very early date, after which a certain number of experienced riders can be taken. A form of application may be included in our next issue.

### DESPATCH RIDERS AND THE GROUPS.

AS is well known, a great many motor cyclists have been drafted into the infantry after being called up under the Group System, on account of the fact that there have been practically no vacancies for motor cyclists. Mr. T. W. Loughborough, secretary of the D.R. Central Office, succeeded in getting exceptions to the rule that all men of Groups 2 to 9 were to be drafted to infantry units, to the extent of fifty motor cyclists from these groups. Naturally, the names of these fifty riders

were already on the waiting lists, the men having been examined and passed by the different inspecting officers.

### INSPECTING OFFICER FOR EAST ANGLIA.

ONE of the inspecting officers for despatch riders given on the War Office list for the East Anglian divisional area is Lt.-Col. Mowat, 74,

Broadway, Peterborough. A reader who called at this address advises us that he found Lt.-Col. Mowat had left Peterborough fourteen months ago, and his present whereabouts were not known locally. The lady who occupies the house now is constantly worried by motor cycle callers and letters from prospective recruits and also from the War Office reaching her daily. After this, motor cyclists may be saved fruitless calls.



A WELCOME RELIEF FROM THE TRENCHES!  
Two men of the Black Watch on leave enjoy a spin on a motor cycle.

## THE PRICE OF PETROL.

LAST week we hazarded the opinion that the price of Shell petrol would be raised to the same extent as Pratt's, viz., 2s. 6d. a gallon. We were wrong, though we hear from various quarters that Shell is very difficult to obtain. It is with much relief, therefore, we publish the following statement by the Asiatic Petroleum Co.:

"The situation in regard to supplies of motor spirit to this country, and the special responsibility which falls upon us as the owners of Shell motor spirit, has prompted us to address our clients direct, and explain to them the situation as it is to-day.

"Of the motor spirit requirements of H.M. Forces we are supplying five times as much as the whole of our competitors put together, but in spite of this great and constantly increasing strain upon our resources we have determined to maintain unchanged the price at which we have been supplying motor spirit to the public. Owing to the increasing requirements of the Forces we cannot maintain the supply of the same large quantities to the public as we have been able to deliver in peace time, and it is for this reason that we have asked our clients to limit their requirements to a minimum, and to use every possible economy in the quantities consumed.

"Our supplies of Shell motor spirit at present available to the public, after supplying the whole of the requirements of H.M. Forces, represent about one-third of the supplies in peace time, and we are of opinion that, having regard to the large number of motorists now withdrawn from this country, if our clients will exercise the utmost possible economy of consumption, we may still be able to satisfy at any rate the major portion of their requirements. We prefer to do this at the old price of 2s. 2d. per gallon rather than to take advantage of the national necessity for raising the price.

"We feel confident that, in continuing to reserve for H.M. Forces sufficient quantities to enable them to receive ample supplies of the finest spirit obtainable, we shall be acting in a manner which commends itself to the very great majority of our clients, and we confidently rely upon their being willing to co-operate with us by economising consumption, and thus limiting to the utmost possible extent imports, the increase of which, as is well known, is directly contrary to the national interests at present.

"It will be our constant endeavour to secure that garages shall receive at least one-third of the quantity of spirit which they have been accustomed to receive from us; and at the old price, which

enables them to sell to consumers at: Shell, 2s. 2d. per gallon; Shell II., 2s. 1d. per gallon; and Crown, 2s. per gallon."

A case was recently brought to our notice of a motorist who, being unable to get supplies of Shell from his agent, ordered Pratt's instead. Imagine his surprise when he was asked by Pratt's agent to give a guarantee that he would only buy this make of petrol, as otherwise the Anglo-American Oil Co. would not supply him. On being informed of the complaint an official of the Anglo-American Oil Co. said, "Our principal competitors have intimated their inability to supply the usual demands, owing, as they say, to their fulfilling Government requirements. Consequently we are called on to supply a great demand, and as facilities are not easy just now we must protect our own customers first. But our own people have no authority to make such pronouncements as that reported by your correspondent. I should say our local man was acting on his own account, and went farther than we would be prepared to support him."

From conversations we have had with officials of various leading petrol firms, we are under the impression that the position is likely to improve.



## An Ingenious Variable Gear.

Adaptable for Chain or Belt Transmission.

**Y**ET another variable gear, and one of extreme ingenuity, is the invention of Mr. Walter Parker, Little Horton Lane, Bradford. This device is distinct from most of its congeners in that it can be adapted for any kind of transmission, and permits an unlimited range of ratios between free engine and the solid top gear.

Fig. 1 is an end view of the device, showing its internal workings in section, while fig. 2 is clearly a longitudinal sectional view. The internal member A is keyed to the driving-shaft, and with it revolves the part C. On this internal portion is mounted the floating portion B, which carries the belt pulley or chain sprocket, as the case may be.

Between these two independent parts is the space D, and with the inner portion revolving and the outer portion stationary (free engine), the device might be likened to a rotary water pump, the member C representing one of the blades of the latter. The space D, however, contains several hundreds of  $\frac{1}{16}$  in. steel balls, which represent solid matter in as near a liquid form as possible, and shallow grooves are cut at the points *x*, into which these balls can sink. With the space D thus completely filled, the balls bind into a solid mass as it were, and compel the outer portion B to rotate

Fig. 1.

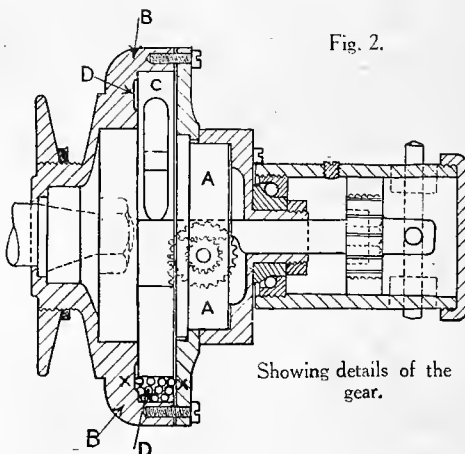
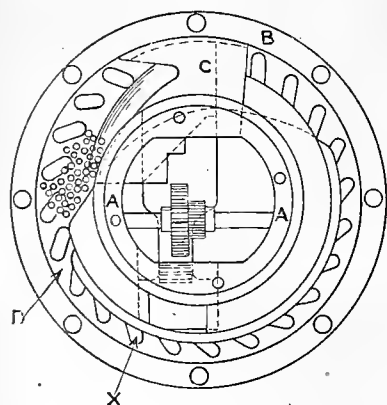


Fig. 2.

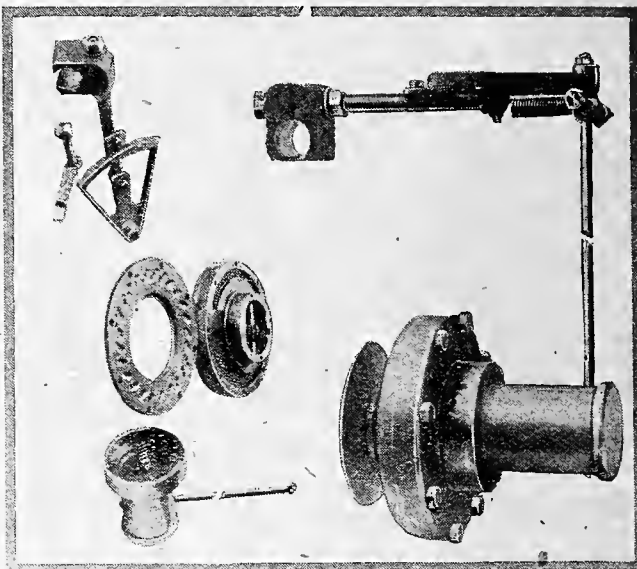
Showing details of the gear.

with the inner or driving portion. Thus a positive drive is obtained, and the range of speeds is accomplished as follows:

The blade C contains a valve, and when this valve is opened the balls are at liberty to pass straight through it in their natural line of travel, and the further the valve is opened the faster they can pass through. With the valve completely opened the blade C simply rotates through the balls instead of forcing them to rotate with it, and thus the inner and the outer portions can move independently.

The speed at which the driving portion A rotates the driven portion B, therefore, is governed entirely by the speed at which the balls are allowed to pass through the valve C, and thus the range of speed extends from solid drive to absolute free engine.

The device can be left to work automatically, the pressure of the balls forcing the valve open in propor-



A variable engine pulley gear. (Left) Parts of the dissected gear. (Right) Assembled gear and control mechanism.

tion with the load, or it can be notched in any position, the internal gear wheels shown governing the action of the valve only.

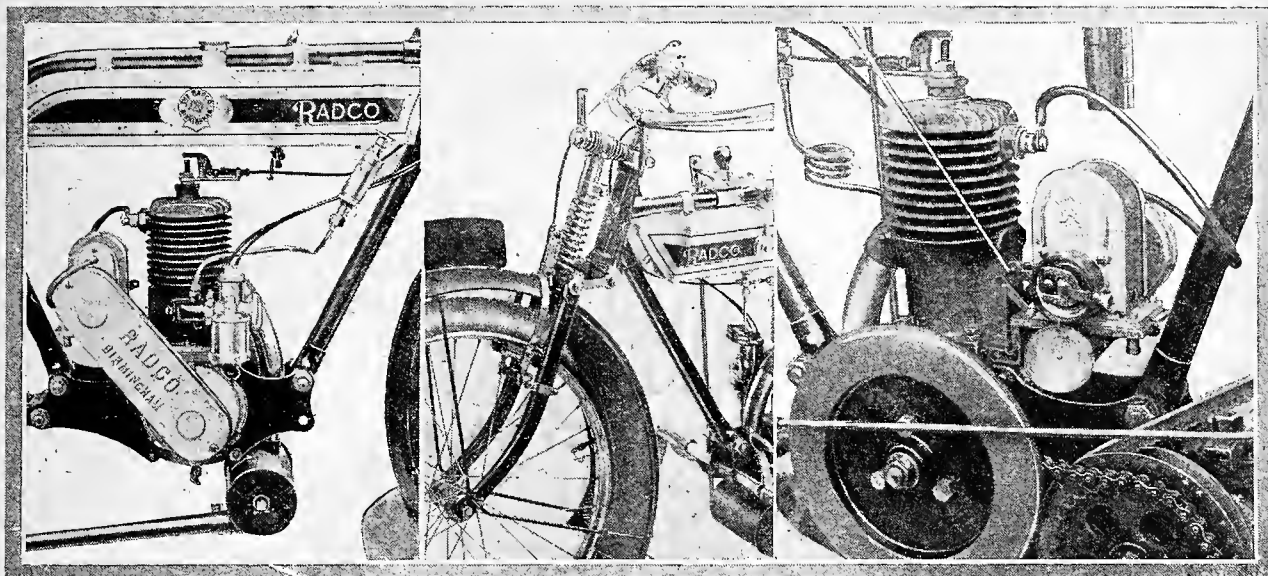
The invention is undergoing extensive road test at the hands of the Caledonia Engineering Co., Bradford, and has been adapted for direct belt drive as proving the most strenuous test for experimental purposes. We are informed that the results obtained are extremely satisfactory, and it is found that the balls are not perceptibly worn after some thousands of miles of running.



Mr. L. C. Desbuslais, of Amritsar, Northern India, and his twin-cylinder Hazlewood. The owner reports that his sidecar outfit has given very good service, and on occasions has been used for long runs with his wife and children as passengers.

## RADCO IMPROVEMENTS.

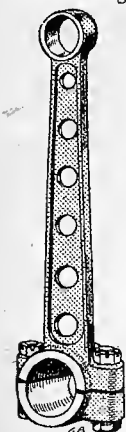
1916 Model fitted with an Extremely Neat and Efficient All-British Magneto.



Left to right: Near view of engine, showing gravity and suction drip feed lubrication to induction pipe. Spring fork, allowing for vertical and horizontal movement. Pulley side, showing the new Lion all-British magneto and the construction of contact breaker.

**L**IKE most motor cycle firms, the Radco Co., of Dartmouth Street, Birmingham, is so busy with munition work at the present time that much attention to motor cycle design is out of the question. However, a few slight alterations have taken place, the most important being the fitting of an extremely neat all-British magneto and a new oiling device.

The magneto is the production of the Britannic Electrical Co., Ltd., Birmingham, and is known as the Lion. The lightweight model, as fitted to the Radco, measures but 4 3/4 in. high by 4 in. overall width. All of the bodywork is made of die castings, which, in addition to its small size, combine to give an extremely neat appearance. The contact breaker differs from general practice, as, instead of having the usual bell crank and spring, these two parts have been incorporated in a Y-shaped spring, the contact points being situated at the single end of the Y, and they work in an in and out direction, so being unaffected by centrifugal force. We hope to be able to give a full description and illustrations of this interesting magneto at a later date.



Drilled connecting rod of the Radco engine.

The lubrication is now carried out by a combined gravity and suction sight feed drip, the oil being carried to the induction pipe, where it is broken up by the velocity of the gas, and conveyed in the form of oil vapour to the various

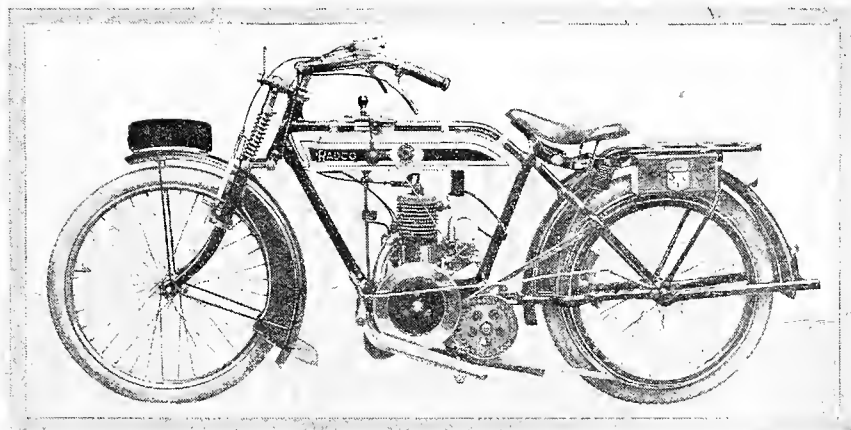
working parts. Mr. Radnall tells us he has found by extensive tests that this system is not only quite as efficient as the petroil system, but is so much more cleanly.

The mudguarding has also received attention, and is now most efficiently carried out. The rear guard, in addition to side valances, also has side extensions over the belt rim, the guard being connected by means of the rear number plate to the carrier, in addition to being supported by the stand, making a most rigid construction. Another minor engine alteration for this year is the design of the flywheel, which is now rounded in section instead of square, and rather heavier than before.

Well-known features of this handy and low-priced little machine are the

neat front forks, which give vertical as well as horizontal movement and the 24x2in. wheels, while on the two-speed model chain and belt drive is used *via* an Albion two-speed gear box. Aluminium footboards and most comfortably wide handle-bars are fitted. A most substantial stand and carrier are also supplied.

With regard to the engine, it is interesting to notice that, though the connecting rod is drilled, an undrilled piston is fitted. A solid crank is used, and the big end bearing is of the split variety, bolted together as in car practice. The magneto is carried at the back of the engine, mounted on a neat but substantial bracket cast in one with the crank case. It is driven by an enclosed chain.



Flywheel side of the 1916 model two-stroke Radco. Combined chain and belt transmission with a two-speed countershaft gear is fitted.

## “SPOTS.”

Yet Another Device for Economising Petrol for which High Claims are made.

“**S**POTS” is the name given to a recently introduced “dope” which, it is claimed, gives the motor cyclist more miles per gallon and more power than when using pure petrol. In America the word “dope” means a drug, and is used by motorists to denote a substance which is put into the petrol with a view to improving the running of an engine. The idea is, of course, not new in this country, and it is known that a small piece of camphor, or a naphthaline ball, such as is employed for keeping moths

from articles of clothing, improves the running of a motor cycle engine to a slight extent.

“Spots,” sold by the Coal By-Products Co., 112, High Holborn, W.C., closely resemble the latter in size, appearance, and smell, but, we are assured, contain no ether, alcohol, or acids, but special ingredients, which are a combination of highly concentrated volatile oils. One of the balls is placed in each two-gallon petrol can overnight, and in the morning the contents are poured into the tank. An increased mileage of at least 25% is

guaranteed, as well as more power. It is also claimed that at each explosion a film-like spray of oil is deposited inside the cylinder, and this prevents the formation of carbon deposit. It is further claimed that two balls in each case will remove the deposit from a badly carbonised engine. When “Spots” are used it is stated that more air may be given.

We are looking forward to a trial of the preparation in the near future, and if it does as well as the makers say, in view of the increased cost of fuel, its existence will be more than justified.

## The Carrying Capacity of Sidecars.

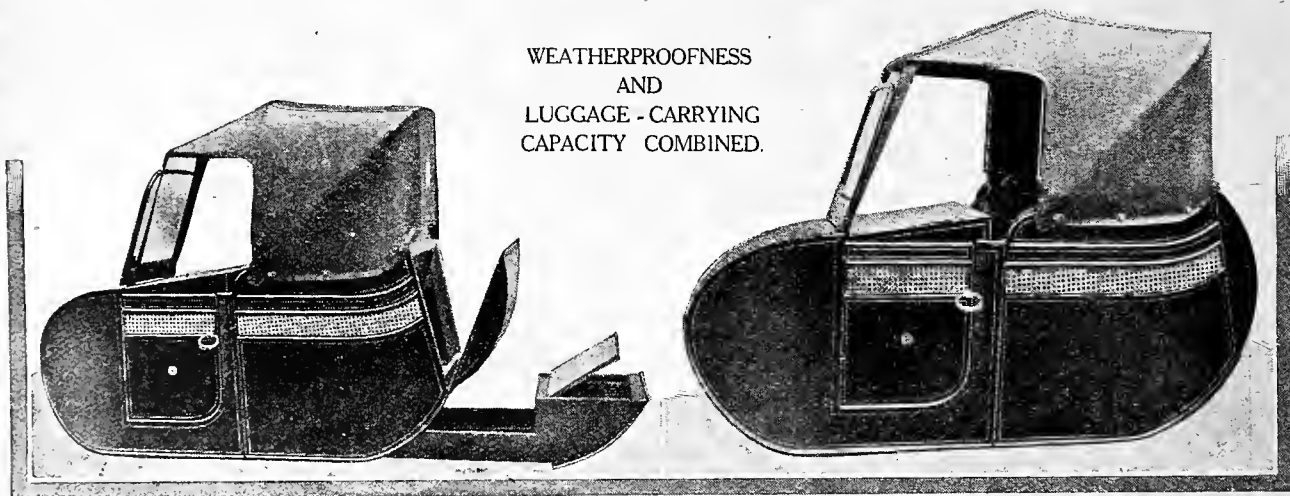
Sensible Location of Tool Lockers on a Montgomery Sidecar.

**T**HOSE riders who find the locker space provided on the average sidecar body insufficient will undoubtedly be interested in a special body produced by Messrs. W. Montgomery and Co., of Coventry, to the specification of a customer. This is of the coachbuilt variety, and is constructed of mahogany panels over an ash framework. The special feature is the manner in which every available space is utilised to provide extra accommodation for carrying any reasonably-sized articles or spares. The first space to be utilised is

that within the bulbous back, which hinges at a point about half-way down, so providing an extensive locker, and the fact that the whole back opens allows quite bulky packages to be stowed away. Below this locker is situated a tray which extends the whole length of the body, with a box attached at the rear end. This tray is 2ft. 10in. long, 16in. wide, and 3½in. deep, while the dimensions of the box are 14in. x 16in. x 8in. In addition to these two special lockers the usual ones under the seat cushion and in the nose of the body are still

retained, thus adding to its capacity. The body is, as is usual in all Montgomery models, excellently finished. The colour is black with gold lines, and has imitation cane panels, while the upholstery is in red pegamoid. When closed it would be almost impossible to notice that any special lockers are provided, and, as will be seen from the illustrations, the general appearance is in no way unsightly, while the extra carrying capacity will undoubtedly prove very useful, especially when on a long tour.

WEATHERPROOFNESS  
AND  
LUGGAGE-CARRYING  
CAPACITY COMBINED.



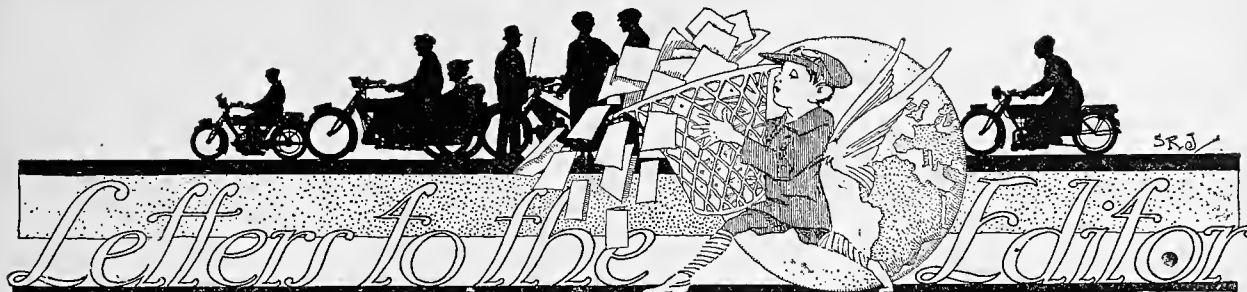
Montgomery sidecar with lockers, so arranged that in order to get at any tools or spares therein it is not necessary to disturb the passenger.

## Saturday's Wounded Soldiers' Outing.

**O**N Saturday next, at twelve noon, about forty Harley-Davidson sidecar outfits will start from St. Thomas's Hospital, Albert Embankment, S.E., the drivers thereof conveying a party of wounded soldiers to the Burford Bridge Hotel, where they will be entertained by the Harley-Davidson Motor Co., Ltd. After lunch there will be a first-class variety entertainment, at which the following artistes, among others, have promised to perform: Miss Irma Cuthbert (vocalist, London

Opera House), Messrs. Clifford Essex (banjoist), and A. C. Chapman (pianist). It is expected that Mr. A. Quintin Roberts, secretary of St. Thomas's Hospital, will accompany the party. It is largely to him that it has been made possible to organise the outing. As formerly, our own military authorities refused to realise that a sidecar was a suitable vehicle in which to take out a wounded soldier. Owing, however, to the fact that Mr. Roberts is the driver of a 3½ h.p. Blackburne and sidecar he

has had no difficulty in persuading the military commandant to acquiesce to the scheme. The company's managing director, Mr. Duncan Watson, and another director, Mr. Withers, will accompany the party. Each driver and passenger will be provided with a folder comprising a route card, programme, and menu. It has been suggested that each driver should take a spare waterproof for his passenger, as though it is hoped the weather will be fine it is best to be prepared.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

### Two and Four-stroke Lightweights.

Sir,—Referring to the last paragraph of your leading article in *The Motor Cycle* of February 10th, we do not know why you should make the statement:

"The fact of the Government being unfavourably disposed towards two-stroke engines provides a natural bar to the adoption of lightweight motor cycles."

Our opinion is that the four-stroke lightweight engine is far superior to any two-stroke. It requires far less attention, and is consequently less trouble to run. The valves need not be looked at for many thousands of miles, nor will there be any carbon to worry about, say, in 4,000 to 5,000 miles. Of course, there are four-stroke engines that give trouble, but all must not be placed in the same category.

THE M.A.G. ENGINE CO., LTD.

OSBORNE DE LISSA, Director.

[Regarding Mr. de Lissa's comments, surely he must know that there are lightweights and lightweights! We would remind him that machines of the four-stroke type, scaling as much as 180 lb., are constantly referred to under the elastic term "lightweight." In writing our article we had in mind the genuine lightweight two-stroke of about 220 c.c. As to our opinion of the respective merits of two and four-stroke engines, the observant reader will have had plenty of opportunity of judging from articles in this journal during the past few months.—ED.]

### Two-stroke Design.

Sir,—We do not wish to enter into a newspaper controversy with either Mr. Martin or Messrs. Butterfield, Ltd., in regard to their remarks in your issue of the 10th inst., but we would claim your courtesy for a brief reply to each.

Mr. Martin presumes we wish to "slate" his design. How he can construe our letter to convey any such meaning is beyond us. We used the term "mixed feelings" to imply surprise and satisfaction that the design we had in hand was considered by him such a step in advancing the two-stroke principle. We may say that our design goes much farther than Mr. Martin's, as will be seen in due time. We, in common with other manufacturers, recognise that the present type of engine has shortcomings, but we maintained that its simplicity and efficiency far outweigh the few disadvantages there may be.

With regard to Messrs. Butterfield's letter, we may say that we were experimenting with our horizontal twin for quite twelve months before any notice of it appeared in the press, and we did not simply put an ordinary cylinder at each side of an ordinary crank case, but worked on original lines.

We forgive the veiled sarcasm *re* our twin being "premature," as we know the Connaught was a bitter pill for them to swallow, but we may say that the only reason for this model not being sold has been our inability to obtain crankshaft forgings and labour, our machines being almost fully occupied by war work, and the few available machines not so occupied were full up with work for standard models on order.

Our twin is a proved success, and, as a matter of fact, we are now busy on large quantities of parts for this engine, which will be offered for sale as soon as possible.

THE BORDESLEY ENGINEERING CO., LTD.

JOHN D. ROWLAND.

Sir,—Mr. J. Martin, in his reply on page 137 of your last issue to criticisms of his original article, accepts our conclusion that a reasonable amount of exhaust gas does no harm, and then qualifies it by contrasting two sets of entirely supposititious figures. So much for the disease which is mythical.

Now for the proposed cure. If an engine be controlled entirely by the release valve, then the throttle must be fully open all the time. The pressure in the crank case, and therefore the negative pressure on the piston, would always be a maximum; the increased amount of petrol in the crank case means all the more to separate out and mix with the oil or go stale. The result of lowered compression in the cylinder is to lower the peak of the pressure volume diagram, and reduce the effective mean pressure on the piston. All this, together with the loss by gas friction in the release valve passage, would combine to give the most wasteful engine imaginable.

The release valve is useful for sudden stops or momentary checks for which it is not worth while altering the throttle position. That is the limit, with mechanism or without.

The above is a justification of the general trend of two-stroke design for engines both small and large. For the rest, we would assure Mr. Martin that at least one  $3\frac{1}{2}$  h.p. air-cooled single does exist, for we make it ourselves, and call it the Bullet; moreover, we believe that an American firm makes a 6 h.p. As for patents, ours cover an ordinary release valve communicating with the transfer passage, but do not, of course, stand in the way of the variable compression idea.

BIRMINGHAM LIGHT MACHINE CO.

H. R. HUGHES.

Sir,—"Rolyat," in your issue of January 27th, denies that the two-stroke is a coarsely running engine, as he finds his so flexible. He then admits that his flexibility is only 20 m.p.h., as his machine will only two-stroke at speeds from 6-26 m.p.h. Most four-strokes of similar power have a flexibility of over 30 m.p.h.

The simple system of ports on the two-stroke is not a good mechanical proposition for several reasons: (1) The timing is very different from that which one would adopt if all the valves were cam-operated; (2) the eddying exhaust gums up the rings while the port is opening; (3) the passage of the piston rings past the ports is bad for the rings and the ports.

I think that in many cases engine rattle is directly attributable to the passage of the rings past the ports, although I believe that engine rattle is more often caused by the piston striking on a carbon ring in the cylinder. Recently I came across an old four-stroke which konked on advancing the spark too far, but emitted a noise exactly similar to engine rattle in two-strokes at all speeds. Inspection showed that wear had produced a ring at the top of the stroke in the cylinder. Filing the edge of the piston so that it did not hit the ring cured the trouble at once.

Mr. Martin's variable compression device for two-strokes is a great step towards raising the thermal efficiency at low speeds. I think that its use will make single-cylinders of  $3\frac{1}{2}$  h.p. and over a great success. Mr. Martin did not mention that the gas is warmed by its cycle from the crank case to the cylinder and back. This should make the machine more economical.

A. B. K. WATKINS.

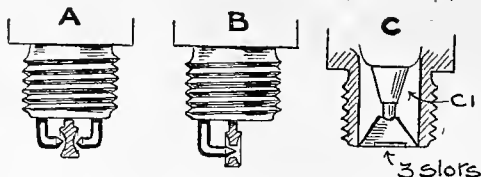


### A Plea for Spring Frames.

Sir,—I should be most grateful if you will allow me the opportunity, through the medium of your paper, of asking your readers if they can suggest any fitment which will eliminate or, at any rate, lessen to a great extent the shocks due to the present appalling conditions of the road surfaces. My machine is a 1916 model with an ordinary unsprung frame. I have been recently invalidated out of the Service, and unless some means are forthcoming whereby the present terrible jolting is, in a great measure, mitigated, I am afraid my motor cycling days will come to an untimely end, which is the last thing in the world I wish to happen. May I add a word of tribute to your excellent journal, which I have taken in for a number of years, and which now, like a motor cycle, I could not do without? EX-L-CPL.

### Sparking Plug Design.

Sir,—May we comment upon the Forward Motor Co.'s letter appearing in your issue of the 3rd inst.? The coincidence of similarity of design may be extended even further than they point out. In the year 1908 Dr. A. M. Low patented a plug (No. 8,628), known as the Cup detonating plug, the firing points of which were shaped according to sketch A. The design of the firing points of the Forward Co.'s patent of 1911 (three years later) is shown



as sketch B. Is there not a "curious similarity" here also? We really fail to see how, in regard to the above, the stigma of "copyist" can be applied to Lt. Burton's idea (sketch C).

We take it that Lt. Burton's idea is that the gas imprisoned around the insulator and within the cavity (C1) formed behind the inverted cone may, in its escape during the inlet stroke of the piston, exercise a cleansing and cooling effect. The essence of the design and the so-called venturi action would appear to lie in the slot perforations arranged around the base of the inverted cone. Where is the prototype of these in the Forward Co.'s patent (sketch B)? Admitted that both types fire from a central electrode to a surrounding ring—so do scores of other makes of plugs, dating back many a year.

We have until now held the view that the function of a plug was to place the spark with regularity and accuracy, and we were unaware that it was possible to obtain a venturi action through a needle eye or a "conical form of cup" (sic) suspended within the cylinder, or even to thread the exploding gas through the same in a given direction for the purpose of any action whatever, venturi or otherwise.

THE SPHINX MANUFACTURING CO.

### Four-cylinder Motor Cycles.

Sir,—In view of the prejudice there is against four-cylinder cycles, may I heartily endorse the letter under the above heading by Wm. O. Harvie in your issue of February 3rd?

I have a 1914 four-cylinder 5 h.p. F.N., and I have not had even your correspondent's trouble with new inlet valve springs. I change the inlet valve springs about every 1,000 miles, and can always run at about six miles per hour on top gear with the engine ticking over.

I am glad to see that "Ixon" is now beginning to admit that four-cylinder cycles may have some good points. I think the F.N. and the Henderson are the only motor cycles worth mentioning or riding, but I like the shaft drive because it is weatherproof. I ride solo, and would ride a 7 h.p. F.N. or a 10 h.p. Henderson solo if it were not for the present hard times. Besides the engine there are many points where the foreign machine beats the conservative English motor cycle; for instance, all the English machines have the front forks bristling with coil springs waiting to be cleaned. Why cannot these springs be put in grease-packed cylinders, as on the F.N. and American machines?

I may say I have no connection with the F.N. Co. or the Henderson.

J. ALGERNON HALLAM.

### Lightweight Sidecar Outfits.

Sir,—Having seen "Two-stroke's" enquiry for information respecting the performance of two-stroke sidecar outfits of 350 c.c., I have pleasure in giving my experience of an outfit of this class.

My machine has an engine of 336 c.c., fitted with a two-speed countershaft gear, no clutch,  $\frac{3}{4}$  in. driving belt, and  $\frac{3}{8}$  in.  $\times$   $\frac{1}{2}$  in. chain. This machine was delivered to me in July last. I fitted a Watsonian featherweight sidecar to make up the combination. The gears fitted were 5 to 1 and  $9\frac{1}{2}$  to 1. This outfit ran satisfactorily with a load of 20 stone for about 1,000 miles, climbing all main road hills encountered. Petrol consumption varied between 70 and 80 m.p.g. The average speed worked out at about 15 m.p.h.; speed bursts on the level, 25 m.p.h.; but I found that it took too much out of the engine to indulge in this speed for long. I find that from 18 to 20 m.p.h. suits the engine best. At the end of 1,000 miles I found what I thought excessive wear on the flywheel bearing. Upon taking the engine down I discovered the crank pin had come loose in the web. I communicated with the makers, and they attributed this mishap to the harsh gear change. However, they treated me very nicely, forwarding me on a new shaft free of cost. I also took the opportunity when I had the engine down of lowering the gears to  $5\frac{1}{2}$  and  $9\frac{3}{4}$  to 1, and up to the time of writing have done 500 miles. The lowering of the gear has made things easier for the engine.

I must not forget, by the way, to mention the Harcourt radiators, which I added when making the overhaul. They are everything the makers claim for them. I also found that my silencer was creating back pressure, the silencer being a plain aluminium drum. To relieve the back pressure I fitted a  $\frac{3}{4}$  in. extension pipe parallel with the existing one. This removed the back pressure, also it has eliminated a good deal of blow-back from which I used to suffer. The only blow-back I get now is from careless manipulation of the air lever. The engine, of course, is a little noisier.

During the 1,500 miles of running my belt has pulled out six times, and the chain has broken once. Threequarter inch belting is too small for the double load; the same remark applies to the chain. My impression of these lightweight outfits is that better value could be obtained in investing the £50 in a second-hand  $3\frac{1}{2}$  h.p. combination. As regards lubrication, my machine was fitted with a drip feed into the induction pipe, which I have discarded in favour of petrol. This system is more economical in oil, but rather messy.

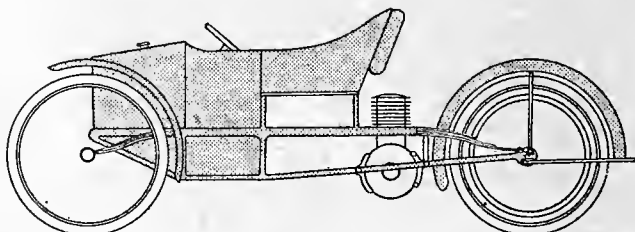
Since using petrol on a 16 to 1 ratio I have never had an oiled-up plug, which I was constantly getting with the drip feed. My drip feed is a very crude arrangement, the oil being fed by gravity. It used to waste more oil than it used.

TWO-STROKE COMBINATION.

### A Simple Single-seater.

Sir,—I am enclosing a sketch of a cycle car which I have designed on simple scale. The wheelbase is 6ft., or the same as the Morgan. The engine is intended to be an 85 $\times$ 88 mm., but I cannot decide on the gear, whether it shall be a hub or a countershaft three-speed. In any case the drive will be from the engine to a countershaft in front by chain, and from the countershaft to the back wheel by belt. The starting handle will be on the countershaft, and the petrol tank attached to the back of the seat (A.C. style), the oil tank being under the dash. The rear mudguard will be pivoted at the front, and will consequently move with the fork and allow of the wheel being taken out.

H.G.



Diagrammatical illustration of three-wheeled monocycle referred to in accompanying letter from H.G.

### Commonsense about the Motor.

Sir,—I was very pleased and honoured to read in Mr. Worsdale's article, "Commonsense about the Motor," that he includes my valve system in the specification of an ideal machine.

I wish respectfully to point out, however, that what he terms a modification of my type is embodied in my patent, viz., the double exhaust port. If he tries it he will find it is all right for racing, but the other type is much better for touring or commercial engines. There are two good reasons why this is so. In the first place, allowing the valve to exhaust out of the top of the cylinder does not keep it so cool, and the absence of the vertical walls takes away the excellent guide. The guide which Mr. Worsdale suggests, he will find, does not operate too well owing to difficulty in lubrication, dust, etc.

Another important point is that the vertical walls allow the exhaust a cleaner exit, i.e., the valve does not cause any baffling as it is pushed up against the pressure in the cylinder. It will be found that the exhaust is not so noisy with this type of valve as it is with the ordinary poppet valve, which, I think, is on account of the vertical walls allowing the gases to slide out, as it were.

MOTOSACOCHE, LTD.,

OSBORNE, DE LISSA, Managing Director.

### Varying the Power of Electric Lights.

Sir,—In reply to a letter from Mr. G. E. Mortley, which appeared in *The Motor Cycle* dated January 20th, in which he criticises my suggestions for the variation of electric lights on motor vehicles, etc. He says there that a six volt dynamo will give a voltage of fifteen to twenty if the main connection is severed. I quite agree with him, for the simple reason that there is no "load" on the dynamo. As a voltmeter takes very little current to work it, what else can be expected with nothing but the meter to consume it? Take a rubber gas-bag, as used with acetylene lamps, for instance. Supposing the tube gets squeezed after it leaves the bag, thus blocking the outlet, does "G.E.M." think the bag would retain its normal size? I do not. He then compares a break in the circuit with a resistance. I fail to see where the resemblance comes in. A resistance consumes current. If not, why is it connected with electric motors for starting purposes? If an electric motor (pulling a load) is started with a simple "knife" switch and no resistance in circuit the current will short through the armature and blow the fuse. If a resistance is used the motor does not get the full current until the resistance is entirely cut out. Therefore, if a resistance does not consume current, where does it go? To sum up, with a resistance in circuit there is a load on the dynamo; with a break in the circuit there is none, so how can Mr. Mortley compare these with each other? To prove what I say is correct, I personally work a P.D.M. testing set for testing horse-power. This comprises in brief a dynamo and a huge wire resistance to consume the current when generated. As more wire is brought into circuit (without altering engine speed) so the voltage will drop, and as it is gradually cut out so will the voltage rise. He then advises connecting two parts of an accumulator in parallel, a practice which is generally disapproved of in electrical "circles," as one will charge into the other.

X.Y.Z.

### Despatch Riders and the Groups.

Sir,—I have just been reading a letter from C. Larwood, who says he is wondering "what consideration I and many other motor cyclists will receive when called up to report with the groups."

I do not know what consideration he will receive, but I jolly well hope he will not receive any, but be shot straight into one of the mud-slugging infantry regiments.

I would like to know what consideration he has given to the motor cyclists who enlisted way back in August and September, 1914, and chanced getting into M.C. units. In my humble opinion, it is a piece of absolute cheek for him to complain at all.

Almost every week there has been a letter from one of these people who have hung back until the last minute, but we never hear about the people who did not stop to argue the point, but went straight ahead and joined up at the commencement of the war. There are hundreds of these in the Army to-day, and when we read about people

like C. Larwood we feel pretty well fed up. I have talked to lots of other motor cyclists in infantry regiments, and they are all of the same opinion as myself.

I should just like to say that the one bright spot in the week from a motor cyclist's point of view is the Friday morning when *The Motor Cycle* appears. I got mine by the morning post, and while I have been writing this four people have asked for it.

I must apologise for taking up so much of your valuable time, but I feel pretty strongly on this point.

R. D. LINFORD (Sgt.).

### Improving Mudguards.

Sir,—A large number of your readers as well as your contributors have given much time and thought to the question of efficiently mudguarding the modern motor cycle. As I use my machine for travelling to and from business almost daily I have also decided that very great alteration needs to be made to a machine as delivered by the makers before one can consider it and the rider efficiently protected.

I have been experimenting with my 6 h.p. water-cooled Humber, and I now claim to have efficiently protected myself in the following manner:

I firstly removed the standard mudguard with its absurd side flaps, holding the mud in, and substituted a plain, slightly curved mudguard 8in. wide, which, I find, entirely prevents the mud flying back when travelling, although, I think, on a very wet day a slight turn back inwards at the inner edge might be an advantage.

Next, I had to protect the machine from road splashing from the front wheel. I have been able to do this very efficiently, because of the water cooling, as there is no need to cut holes in the shield to allow for the cooling of the cylinders. I have had the shield carried from immediately below the radiator, from which point it gradually widened until it was the full width of the footboards at the front right to the back of the engine so that everything is now well protected. It was a certain amount of trouble to fit the front guards because of the clearance required for the front fork springs, but Mr. Victor Horsman (who is well-known at Brooklands track) personally superintended the job for me at his repair depot, Hart Street, Liverpool, and has made a first-class job of it.

S. W. PHILLPOTT.



E. G. Mauer, until recently vice-president of the Moscow Motor Cyclists' Society, and now rider of an Indian in the motor cycle section of the Russian Army. Mr. Mauer is a keen rider, well-known in Moscow motor cycling circles, and much of the success of the society is due to his efforts.

# QUESTIONS & REPLIES



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Licence for Tricar.

? What is the motor tax on motor vehicles of the Morgan, A.C. Sociable, and the Williamson Cycla type?—W.G.N.

The local taxation licence for any three-wheeled vehicle is £1. If, however, the weight exceeds 3 cwt., it will have to be registered as a car, and car numbers obtained, the fee for which is £1 ls., as against only 5s. if the car is less than 3 cwt.

## Timing a Four-cylinder.

? Please tell me the best way to time my four-cylinder F.N. motor cycle as regards the firing and exhaust valves. The engine is the old type with automatic inlet valves, and fitted with a B. and B. single-jet carburetter. The machine is fitted with a two-speed gear and coachbuilt sidecar. I have overhauled the engine, reground the cylinders, fitted new pistons and rings, and had engine running with 5 mm. advance. I can do thirty miles per hour with an empty sidecar, but it dies out on a long hill. Can you tell me the cause of this?—J.A.

The engine should be timed in the following manner: Turn the crankshaft until the piston of the back cylinder is five to six millimetres from the top of the compression stroke. Unless the slide holder on the crankshaft has been altered, the carbon brush of this will point to the position of the bottom right-hand terminal of distributor, assuming the latter is in position. Now grasp the contact breaker of the magneto, and turn it until the maximum resistance is felt, and slide the magneto gear wheel into engagement with the corresponding wheel on the crankshaft of the engine. Having bolted up the magneto and fitted on the distributor, verify the timing. The points of the contact breaker should commence to separate when the back cylinder piston is in the aforementioned position. The wiring of the distributor in relation to the respective cylinders is: bottom right wire to back cylinder; top right wire to third cylinder from back (or second from front); bottom left wire to second cylinder from back; top left wire to front cylinder. The lengths of the wires will, in themselves, show to which cylinders they go. The exhaust valve should be set to close just after the piston has reached the top

of the stroke. It is hard to say why the engine dies away on a hill. Possibly this is through overheating. However, after the cylinders have been reground, and new piston and rings fitted, the engine will have to run for a short time before it will develop its full output.

## Position of Rear Lamp.

? In the new rear light Act is it a fact that the red light has to be fixed to the extreme right side of the motor cycle? I have lately fitted several electric rear lights, and have fixed them on the sidecar.—H.B.

Although it is not exactly illegal to place the rear light in the centre of the machines, it is always advisable to carry it on the extreme off side when possible, especially now that head lights are practically prohibited and side lights so reduced.

## Removing a Cylinder.

? My machine is a 2½ h.p. two-stroke, which I have used for going backwards and forwards to work, a distance of twenty-five miles each day. I have not used it of late owing to the bad weather. As I was contemplating using it again soon, I thought I would take the engine down and remove the carbon deposit. After removing the four holding-down nuts and other connections, I attempted to lift the cylinder off, but it would only lift about 1½ in., and after much pulling and straining it became so fast that it would not move in either direction. I have tried pouring paraffin into cylinder and leaving it to soak, and several other methods, but without success. I should be obliged if you could suggest what is likely to be the cause of the trouble.—N.R.

It is probable that your trouble is due to a broken piston ring, which on passing one of the ports has sprung out slightly sideways into the port, so preventing the cylinder from sliding off further. You should remove all connections from the ports, and ascertain if this is so or not. The only other way seems to be to remove the valve fitting at top of cylinder, and while attempting to lift the cylinder at the same time gently tap the top of the piston with a piece of wood inserted through the release valve orifice.

## Too Noisy a Machine.

? I have recently purchased a 1912 4 h.p. motor bicycle with sidecar. The other day I was stopped by a police inspector and constable, as they said my engine was making too much noise. They anticipated finding a cut-out which I have not got, and said the silencer had no business to have holes in such as it had. There were four on one side and ten on the other, not nearly as large as a threepenny bit. These, they said, must be stopped up. The garage proprietor from whom I bought the machine stopped them up for me, but, of course, the engine got abnormally hot with very little work. I have opened five of the holes, three on one side and two on the other, but the constable who stopped me recently saw me again, and said there was too much noise still. I am at a complete loss to understand how it can be so. The silencer is all right and is the ordinary type of thing, but has no baffle plates. The police, however, were unable to put their hand upon the regulations when I called at the police station a few days later, and I should be glad if you could tell me what these are.—J.F.H.

Unfortunately you are absolutely in the hands of the constable, who has really treated you quite well, as he could have summoned you on the spot if the machine, in his opinion, were too noisy. The difficulty could be overcome by stopping up all the holes, if the silencer is of the design we think it is; namely, merely an expansion chamber with a fairly long exit pipe. This should give a sufficiently free exit for the exhaust without causing overheating or loss of power. If, however, the silencer is not designed in this manner you could have a new one made as suggested, or could purchase one of the many silencers sold for attaching to most standard motor cycles. The silencer regulation reads as follows: "He shall not use any cut-out fitting or other apparatus or device which will allow the exhaust gases from the engine . . . to go straight into the atmosphere without first passing through a silencer, expansion chamber, or other contrivance, suitable for reducing, as far as may reasonably be practicable, the noise which would otherwise be caused by the escape of the gases."

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**Lubricating a Two-stroke.**

**Q.** (1.) I own a 2½-2¾ h.p. two-stroke. Could I fit a lightweight sidecar and carry a passenger weighing 9 stone without doing any very great harm to the machine? (2.) I give my machine one pumpful of oil every three miles. Is this the correct quantity? (3.) Does the magneto which is fitted require any lubrication? There are no holes in which to lubricate. Has it fibre or wood bearings? (4.) I have run it about 2,000 miles, and have always been able to give full air at any speed. Lately, however, I have not been able to give full air except at a speed of about 20 m.p.h. without backfiring. I have cleaned the engine of carbon deposit, plug, exhaust box, and also the carburetter, and have made quite sure there is no air leak anywhere; also the timing is, I believe, quite correct, viz., contact points just breaking with piston on top centre (spark fully retarded). Can I remedy this, or does it not make any difference to the engine? I notice it gets rather hotter than it used to do.—W.R.C.

1.) Light sidecars are very frequently used with these little machines, and, if carefully driven, there is no reason why damage should result. (2.) One pumpful of oil every three miles sounds rather too much, but it depends largely on the size of the pump. With a two-stroke it is really better to have a drip feed of some kind, so that the engine obtains an even quantity of oil the whole time. So long as the engine does not emit blue smoke all the while it is not being over-lubricated. If it is obtaining about the correct amount of oil there should be signs of blue smoke from the exhaust when opening out after running slowly for a short time. (3.) If no provision is made for lubrication the magneto is evidently lubricated by means of grease packed into the bearings, and should last

for a very considerable number of miles, probably 5,000, after which distance the machine should be taken apart and fresh grease inserted. The bearings are probably of the ball variety. (4.) The reason that you are unable to give as much air as previously may be due to any of the following reasons: (a.) The atmosphere being colder. (b.) Partial stoppage of one of the petrol passages or jet in the carburetter. (c.) Slight air leak either between the carburetter and engine or somewhere in the crank chamber. If the machine will take full air at speeds above 20 m.p.h. and will take a certain proportion when running at slower speeds it would seem as though the carburetter were adjusted about right.

**Lighting from Magneto.**

**Q.** If the low-tension current of a motor cycle magneto (single-cylinder) is used for lighting:

(1.) Is the light constant or intermittent? (2.) Is the magneto damaged in any way? (3.) Is the intensity of the spark at the plug appreciably affected especially at slow speeds? (4.) Does the voltage vary much in relation to speed of engine? (5.) What is the lowest volt lamp that can safely be used? I have tried the ordinary flash lamp bulb (about four volt, I believe), which burnt out in a few seconds at a fairly slow armature speed. I propose to adopt this method for a sidecar light if answers to above are satisfactory. (6.) Will the vibration on sidecar chassis be too much for an electric bulb?—G.H.

(1.) Intermittent. (2.) No, no damage is done. (3.) If no choking coil is inserted in the circuit no current is produced in the secondary winding. The power of the spark is slightly affected, especially at low speed, even when a choking coil is used. (4.) No; above a certain number of revolutions the voltage hardly alters. (5.) If no choking coil

is used a lamp of about six or eight volts is necessary. If, however, a choking coil is used, so that ignition can take place at the same time, a bulb of about two volts or less is usually used. (6.) No, the vibration, unless very excessive, should not damage the filament of a good make of lamp.

**READER'S REPLY.****Wanted, a Foot Warmer.**

It may interest "W.J.H.," even if it is no new thing, to know that an ordinary oil tin makes an excellent foot-warmer for the sidecar. My own method is to take an empty half-gallon Mobiloil tin fitted with the large tin stopper (not the small brass stopper as is usually fitted to the B. and K. grade tins). Cut a rubber disc which is large enough to just fit the opening, fill the tin with hot water right up to the top; in fact, fill it until the rubber is resting on the water as well as the tin flange. I then screw in the stopper as tight as I can with my fingers, and, as a general rule, the joint is watertight; but, if it is not, a very little turn given with any kind of lever is sufficient to make a good joint. I then wrap up the foot-warmer in anything that comes handy—an old sack, or bit of carpet, or a piece of flannel. One of the reasons for using a covering is to prevent injury to boots in case the water is too hot; also the heat is retained longer. I may say the weight of the tin, including water, is exactly 6 lb.—H.H.

**EXPERIENCES WANTED.**

Readers desirous of obtaining the experience of others with various motor cycles or accessories must enclose a stamped addressed envelope in which the replies may be forwarded. Answers to the queries should be addressed c/o The Editor.

"L.N.P." (Birmingham).—2½ h.p. 1915 Enfield, also 2¾ h.p. Douglas for sidecar work. Reliability, speed, and consumption.

"F.J.K." (Castleblayney).—5 h.p. 1915 spring frame Bat, 4 h.p. 1915 A.J.S., and 3½ h.p. 1915 Sunbeam. Reliability and consumption.

"E.A." (Birmingham).—1916 Enfield combination, with Lucas electric lighting set. Reliability, durability, consumption, and speed.

"S.J." (Devon).—Binks carburetter for 6 h.p. Enfield-Jap; also Binks spirit. Power, consumption with sidecar, effect on engine, and efficiency.

"V.N.G." (London).—Carden two-seater, or monocar. Speed, consumption, springing, and wear of tyres.

**RECOMMENDED ROUTES.**

BEACONSFIELD (BUCKS.) TO CROUCH END (N. LONDON).—W.T.

Beaconsfield, Gerrard's Cross, Uxbridge, Ruislip, Eastcote, Pinner, Harrow, Kenton, Hendon, East Finchley, Muswell Hill, Crouch End.

NEWCASTLE (STAFFS.) TO PEMBROKE DOCK.—A.L.

Newcastle, Market Drayton, Hodnet, Shrewsbury, Bishop's Castle, Clun, Knighton, Kington, Willersey, Hay, Brecon, Llandovery, Llandilo, Carmarthen, St. Clears, Pembroke.



A DESPATCH RIDERS' FOOTBALL TEAM BEHIND THE FIRING LINE IN FRANCE.

Many motor cyclists will be recognised from the following list of names:

(Top row) Sapper Bartleet (referee), Cpl. L. Maxwell, Cpl. G. Maxwell, Sgt. O. L. Summers, Cpl. J. Bones, and Cpl.-Art. L. G. Sims.

(Middle row) Cpls. A. E. Crampton, G. Woodman, N. Sims (hon. sec.), H. Floyd, and N. E. Hellier.

(Bottom row) Cpls. L. Alexander, J. E. Hudson, F. C. Allen (capt.), J. White, and E. D. Osgood.

The men have to thank Messrs. Douglas Bros. for the jerseys and ball.



## Average Prices — of — Second-hand Machines.

**W**E give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted. If there were not at least two advertisements, then the last average is given.

Make.	Year.	H.P.	Average last week.	Latest weekly average obtainable
A.J.S. ....	1915 6	3-sp. sidecar ..	—	£82
" .....	1914 6	3-sp. sidecar ..	—	£74
" .....	1913 6	3-sp. sidecar ..	—	£57
" .....	1915 2½	2-speed .....	£50	—
Allon .....	1915 2½	2-speed .....	—	£36
Ariel .....	1914 3½	3-sp. sidecar ..	—	£53
" .....	1913 3½	3-sp. sidecar ..	—	£44
Bradbury ..	1914 4	3-sp. sidecar ..	—	£47
B.S.A. ....	1915 4½	3-sp. sidecar ..	£67	—
" .....	1914 4½	3-sp. sidecar ..	—	£49
" .....	1913 3½	2-sp. sidecar ..	£40	—
" .....	1915 4½	3-speed .....	—	£53
" .....	1913 3½	2-speed .....	—	£31
Calthorpe ..	1915 2½	2-speed .....	—	£26
" .....	1914 2	2-speed .....	£16	—
Clyno .....	1914 6	3-sp. sidecar ..	—	£66
" .....	1913 6	3-sp. sidecar ..	—	£50
Douglas ..	1915 2½	3-speed .....	—	£45
" .....	1915 2½	2-speed .....	£44	—
" .....	1914 2½	2-sp. kick start ..	—	£38
" .....	1914 2½	2-speed T.T. ....	—	£38
" .....	1913 2½	2-sp. kick start ..	—	£32
" .....	1913 2½	2-speed T.T. ....	—	£31
Enfield ....	1915 6	2-sp. sidecar ..	—	£68
" .....	1914 6	2-sp. sidecar ..	£61	—
" .....	1913 6	2-sp. sidecar ..	£47	—
" .....	1913 3	2-speed .....	£41	—
" .....	1914 3	2-speed .....	—	£37
Excelsior ..	1914 7	2-sp. sidecar ..	—	£55
H.-Davidson	1915 7	3-sp. sidecar ..	—	£80
Indian .....	1915 7	3-sp. sidecar ..	£70	—
" .....	1915 7	3-speed .....	—	£63
" .....	1914 7	2-sp. sidecar ..	£55	—
" .....	1914 7	2-speed .....	£44	—
" .....	1914 7	T.T. free eng. ....	—	£44
" .....	1915 5	3-sp. sidecar ..	£58	—
" .....	1915 5	3-speed .....	£52	—
James .....	1915 4½	3-sp. sidecar ..	£60	—
Lea-Francis	1915 3	3-speed .....	—	£63
Levis .....	1915 2½	de Luxe .....	£37	—
" .....	1915	Popular .....	—	£24
Matchless ..	1915 8	3-sp. sidecar ..	—	£80
" .....	1914 8	2-sp. sidecar ..	—	£70
" .....	1913 8	2-sp. sidecar ..	—	£53
New Hudson	1915 6	3-sp. sidecar ..	—	£61
" .....	1915 2½	2-speed .....	£25	—
New Imperial	1915 2½	2-speed .....	£29	—
" .....	1914 2½	2-speed .....	£25	—
O.K. ....	1915 2	2-speed .....	—	£23
" .....	1914 2	2-speed .....	£21	—
P. & M. ....	1914 3½	2-sp. sidecar ..	—	£50
" .....	1913 3½	2-sp. sidecar ..	—	£43
" .....	1913 3½	2-speed .....	£40	—
Premier ....	1914 3½	3-sp. sidecar ..	—	£48
" .....	1913 3½	2-sp. sidecar ..	—	£32
Quadrant ..	1915 4½	3-sp. sidecar ..	—	£60
Rex .....	1914 4	2-sp. sidecar ..	£48	—
Rover .....	1915 3½	3-sp. sidecar ..	—	£61
" .....	1914 3½	3-sp. sidecar ..	£43	—
" .....	1913 3½	3-sp. sidecar ..	—	£40
Rudge .....	1915 6-6	Multi sidecar ..	—	£41
" .....	1915 3	Multi .....	—	£47
" .....	1914 3	Multi .....	£36	—
" .....	1913 3	Multi .....	£31	—
" .....	1914 3	Multi sidecar ..	—	£47
Scott .....	1914 3	2-sp. sidecar ..	—	£49
" .....	1913 3	2-sp. sidecar ..	—	£48
Sunbeam ....	1915 6	3-sp. sidecar ..	—	£96
" .....	1914 6	3-sp. sidecar ..	—	£80
" .....	1915 3	3-speed .....	—	£63
" .....	1914 3	3-speed .....	—	£52
Triumph ....	1914 4	3-sp. sidecar ..	£58	—
" .....	1914 4	3-speed .....	£44	—
" .....	1915 2½	2-stroke .....	—	£36
" .....	1913 3½	3-sp. sidecar ..	£43	—
" .....	1913 3	3-speed .....	£37	—
Williamson ..	1914 8	2-sp. sidecar ..	—	£63
" .....	1913 8	2-sp. sidecar ..	—	£55
Zenith .....	1914 8	Gradua sidecar ..	£67	—
" .....	1914 6	Gradua sidecar ..	—	£56



### Australian made Tyres.

**T**HE Dunlop Rubber Co. of Australia has completed at Melbourne what is claimed to be the finest tyre-producing plant south of the Equator. The mills provide employment for 1,400 hands.

### Government Work and Private Overhauls.

We are informed by Messrs. Auto-Wheels, Ltd., that owing to a very much reduced staff, and to the fact that they have important war work on hand, they find it impossible to undertake overhauls at the present time. Any Auto-wheels sent to this firm for this purpose have either to go into stock or to be returned to the customer.

### Australian Road Records.

Last week we chronicled new road records made in Victoria by the American rider, Erwin G. Baker, on a Power-plus model Indian. In the 1,027 miles record, which was covered in 21½ hours, Baker's engine, we are informed, was lubricated with Wakefield's Castrol.

### An Ingenious Windscreen.

To prevent misunderstanding, we are asked to state that the Curry and Pitcher adjustable screen, illustrated on page 78 of our issue of January 27th, is made by the Watsonian Folding Sidecar Co., Ltd., of Conyhere Street, Birmingham. The design has been provisionally patented.

### A Government Permit.

J. E. Brown, 38, Herbert Road, Plumstead, the manufacturer of the well-known Jebron magneto contact points, informs us that he has received a Government permit to supply platinum rivets and screws on condition that they are used either directly or indirectly as war material.

### Reviews.

"The A.B.C. Guide to Patents for Inventions."—R. E. Phillips and A. M. Flack; Phillipps, 70, Chancery Lane, W.C. An exceedingly useful publication, the chief merit of which is the grouping of the matter contained therein, in paragraphs arranged under alphabetical headings, so that the desired information on any particular point can be found with the minimum amount of trouble.

### Rudge-Whitworth's London Manager.

Mr. E. M. Mayes has resigned his position as London manager of Messrs. Rudge-Whitworth, Ltd., after nearly twenty-two years' service with the company, owing to health considerations. Mr. Mayes will be well known to Brooklands habitués, as he always "fathered" Rudge track interests, and, needless to say, he is even better known among trade men. His place is being filled by Mr. T. H. Mobbs, until now at the R.W. Tottenham, Court, Road depot.

### Catalogues Received.

We have lately received a new catalogue of Messrs. The Metropolitan Machinists' Co., Ltd., 248, Bishopsgate, E.C., which includes all the latest accessories and their prices. It is a publication of general interest to motor cyclists.

We are in receipt of the 1916 edition of Willing's Press Guide, Messrs. James Willing, Ltd., advertising contractors and publishers, 125, Strand, W.C., 1s. This book contains a list of practically all the newspapers and periodicals printed in the United Kingdom, arranged in alphabetical order, together with name and address of publishers, price, and day of publication (if not daily). It also gives the names of the principal Colonial and foreign newspapers, and their London addresses. It concludes with a useful list of reporting and telegraphing news agencies.

### Over-size Kempshall Tyres.

The new over-size Kempshall non-skid 700 x 85 mm. tyre is designed to fit 650 x 65 mm. rims. It will be noticed from the illustration that an improvement introduced this year consists in making the beads so that they overlap. This forms a perfect nest for the tube, and prevents nipping. This tyre is now made up with five plies of canvas, and is very strong.



### An Electrical Exhibit.

Messrs. Ward and Goldstone inform us that, in spite of their factory being at present under Government control and on war work, they have been granted special permission to exhibit a large number of their articles of manufacture, which consist principally of such goods as were made almost entirely in Germany before the war, at the Board of Trade exhibition, which will be held from February 21st to March 3rd in the Victoria and Albert Museum. These articles will be a large range of electric pocket lamps, torches, spare batteries, hand lamps, and electrical appliances for the car and garage. Their stand number will be A16.

### A New Year's Day Company.

Messrs. C. A. Vandervell and Co., Ltd., ask us to state that although Mr. Vandervell has turned his Acton business into a limited company of £350,000, there will be no issue of shares to the public, the business remaining as before, solely a "one-man show." With the exception of a few shares, the whole of the capital remains in the hands of Mr. Vandervell himself, the sole founder and proprietor of the business.

## MOTOR CYCLES FOR SALE.

## Alldays.

**ALLDAYS** Matchless, 2½ h.p., 2-stroke, lamps, accessories, good tyres; £20, or nearest offer.—111, Grove Lane, Camberwell. [X191]

**ALLON**—Every model of these wonderful machines actually in stock at the Colmore Depot's London Agency, 44, Finsbury Pavement, E.C. [X791]

**ALLON**, 1916, 2½ h.p., 2-stroke, 2 speeds, and clutch; £35.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X2300]

**ALLDAYS** Allon, Nov., 1915, makers just fitted 1916 brakes, etc., head and rear lamps, only done 300 miles: £35.—Lt. Thomas, 53rd W.D., A.S.C., Seaford. [X2122]

**NEW Allons**, 2-speed models £42, single-speed models £34; delivery from stock; cash or extended payments.—Wauchope's, 9, Shoe Lane, London. [X2199]

**ALLON** 2-stroke, 2½ h.p., late 1915, complete with 2-speed, F.R.S. rear light, horn; cost £48/6 in all, will accept £34.—Swainbank, Boulton Lane, Wood End, near Atherton. [X2066]

**ALLDAYS** Matchless Combination, late 1914, 3½ h.p., countershaft, 3-speed, kick starter, foot clutch, underslung coachbuilt sidecar, nearly new tyres, all chain drive, all accessories; bargain, £40.—64, Mill Lane, Brixton Hill. [X2282]

**1916 Alldays** Matchless, 6-h.p., 3 speeds, chain drive, latest Millford Empress sidecar, hood, screen, side curtains, tyre carrier, Autoclipse lamp, solid aluminium rear light, Corbin speedometer, Lucas horn, all absolutely as new; cost £109 only few weeks ago; owner called up; best offers.—H. S. Purcell, Audlem, Cheshire. [X9937]

## Ariel.

**ARIEL** combination, 5-h.p., countershaft, handlebar control, just delivered; £94.—Dan Guy, Weymouth. [X1077]

**ARIEL** Lightweight, mag., B.B. carburettor, excellent condition; accept £6/10.—E., 208, Camberwell Rd., S.E. [X1059]

**1913 Ariel**, 3-speed, 3½ h.p., and sidecar, in perfect order; £35; easy payment arranged.—Jones, Garage, Muswell Hill, N. [X1207]

**3½ h.p. Ariel**, in grand running order and condition; £22.—Particulars, George Baniabridge, Front St., Witton, Gilbey, Durham. [X2058]

**1916 Ariels**, 5-h.p. and 3½ h.p. combinations actually in stock; ladies taught free by lady tutor; deferred payments arranged.—Ariel Special Agent, Jones Garage, Muswell Hill, N. [X1206]

**ARIEL**, 1916, all models actually in stock; trade supplied; special deferred payments if desired; liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X1174]

## Aroo.

**3½ h.p. Aroo** Combination, 1913, good order, new tyres £2 and belt; bargain, £22/10.—18, South Bruton Mews, Bond St., W. [X9918]

**SMART** Combination, 1914 3½ h.p. Aroo, 3-speed, canoe sidecar, well upholstered, lamp, horn, Senspray; 38 gns.—Railway Garage, Staines. [X1240]

## Auto-Wheels.

**UTO-WHEEL**, good condition; £5/15.—Mrs. Gidley, 37, Furzehill Rd., Plymouth. [X1194]

## Bat.

**BAT-J.A.P.** 1915 Combination, 6 h.p., mag., 3 speeds; £58/10.—1, Esher St., Wandsworth. [X2265]

**BATS**, 1916 4 h.p. twins, new 2-speed gear and free engine models; £60/7/6; delivery from stock.—Wauchope's, 9, Shoe Lane, London. [X2218]

**BAT-J.A.P.** 1912, 8 h.p., free engine, splendid condition, smart appearance, recently enamelled and plated; £26; genuine.—Cater, St. Cloud, Amersham. [X3596]

**BAT** 1915 4-h.p. Twin, 2-speed countershaft gear, chain-cum-belt drive, brand new; list price £60/7/6; special price for cash, £55.—Elice and Co., 15-16, Bishopsgate Ave., Camomile St., E.C. [X0598]

**8-10 h.p. Bat-Jap**, 1912, spring frame, special racing model, overhead valves, new Palmer cord, 2 belts, very fast and powerful, perfect condition; £28, lowest.—Reid, Sunnyside, Lightcliffe, Halifax. [X2307]

## Bradbury.

**BRADBURY** 1916 Models.—Agents, Bright and Hayles, 73, Church St., Camberwell Green. [X1093]

**1914 Bradbury** Combination, 4 h.p., splendid condition; £40, or offer.—4, Grove Green Rd., Leyton. [X1192]

**BRADBURY**, 4 h.p., 1913, 2-speed and free engine, accessories, excellent condition; £28.—A.J.E., 11, Looe Rd., Sevenoaks. [X1936]

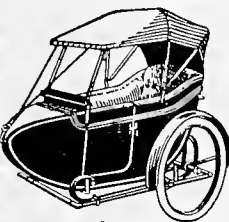
**BRADBURY**, 4 h.p., was new 1913, free engine, 2-speed, R. gn. Canoe sidecar, screen, lamps, speedometer; £29.—69, Hamburg St., Spitalfields. [X1156]

**BRADBURY**, 1912, 3½ h.p., 2-speed, head lamp, back lamp, horn, and Cowey speedometer; £27.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X2293]

**BRADBURY**, 1914, 6 h.p., 3-speed combination, hood and screen, Lucas accessories, 63 gns.; also 1912, 3½ h.p., 2-speed, with aluminium sidecar, all accessories, 35 gns.; special deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X1177]

## CORONET Sidecar Chassis

is designed for long life, and has a wonderful reserve of stability, and is safe on greasy roads. Luggage carrier built into frame. Cannot shake loose, and is a boon when touring.



£10 15s.

Send for illustrated catalogue describing these well known Sidecars.

EXCHANGES.

TRADE SUPPLIED.

We can give immediate delivery of all models, and suitable for any make of machine.

## Coronet Sidecars for Harley-Davidsons.

We make a special Sidecar, enamelled French grey to match, 28 x 3 in tyre, apron to cover entire body, and 4-point attachment ..... £13 10 Immediate Delivery.

## 7-9 h.p. HARLEY-DAVIDSON.

11J, electrically equipped, 3 speeds ..... £76 13  
11F, standard 3-speed model ..... £68 5  
1916 models also in stock.

## NEW 1916 FORDS.

5-seater Touring Car ..... £135  
Delivery Van ..... £130  
Motor cycles taken in exchange.

## SPECIAL BARGAINS.

7-9 h.p. HARLEY-DAVIDSON, 3-sp., with coach Sidecar to match ..... £75 0  
6 h.p. A.J.S., 1915, lamps, horn, speedometer, etc. .... £68 15  
4½ h.p. STAR, brand new big single, 3-sp. countershaft gear, chain drive, kick starter; listed at £68 5s. .... £55 15  
3½ h.p. LEA-FRANCIS, 1915, nearly new, 3-speed, kick starter, Hercules £13 13 Sidecar, £5 5 speedometer, £3 10 lamp set; the whole cost £94 10 ..... £65 0  
2½ h.p. WOLF, 1916, 2-stroke, 2-speed ..... £33 10  
4 h.p. WOLF, 1916, 3-speed, chain drive. .... £49 15  
2½ h.p. LEVIS, 1915, 2-stroke, 2-speed ..... £25 15  
3½ h.p. HUMBER, 1914, 3-speed model, with Sidecar. .... £39 15  
3½ h.p. PRECISION, 1912, nice condition. .... £16 15  
1913 HUMBERETTE Cycle Car, hood, screen, electric lamps, 3 speeds and reverse, good tyres ..... £47 15  
3½ h.p. RUDGE, 1912, free-engine model. .... £19 15  
4 h.p. QUADRANT, 1912, 3-speed model ..... £20 15  
3½ h.p. SINGER, 1912, 3-speed model, with cane Sidecar ..... £25 0  
3½ h.p. SINGER, 1912, 3-speed gear ..... £22 10  
3 h.p. HUMBER tricar ..... £5 5  
1½ h.p. WOLF, 1912, magneto ..... £9 10  
4½ h.p. JAMES, 1914, 3-speed, with James coach Sidecar ..... £48 15  
3½ h.p. P. & M., 1911 model, with coach built Sidecar ..... £31 10  
1915 MORGAN, 700 x 80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. .... £89 0  
2 h.p. CALTHORPE Lightweight, 1914, 4-stroke model, countershaft 2-speed, nice order ..... £17 15  
3½ h.p. PREMIER, 1911, B.S.A. 2-speed. .... £19 15  
1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn and lamps ..... £99 15

## MISCELLANEOUS.

New Cane Body, open type; cost 35/- .. 10/6  
New complete Sidecar Chassis ..... £3 5  
New Underslung Sidecar Chassis, complete Wicker Sidecar Bodies; to clear ..... 3/6  
New Coach-built Body, side door ..... 57/6  
Brand New Waterproof Magneto ..... 70/-  
New 21/- Glare Brass Electric Tail Lamp ..... 4/11  
New 2½ h.p. Stationary Petrol Engine, two flywheels, magneto; listed £22 10 ..  
New Torpedo Cane Sidecar Body ..... £3 0

BOOTH'S MOTORIES,  
PORTLAND PLACE, SKIRCOAT ROAD,  
HALIFAX.

Phone 1062. Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## Brown.

**3½ h.p. Brown**, excellent condition, all accessories, 12 mag.; £12.—Dalby, Amberley, Glos. [X9771]

## B.S.A.

**B.S.A.**, 1916.—Both models in stock, or for immediate delivery.—Moss, Wem. [X2172]

**B.S.A.**, new 4½ h.p. model K, prompt deliveries given by Slack's Garage, Stockport. [X1454]

**1916 B.S.A.**, model K, Gloria sidecar, just delivered; cost £80, accept £68.—Wilkes, Ellesmere. [X2237]

**B.S.A.**, 2-speed, and sidecar, Lucas lamp, speedometer, horn; £33.—Wilson, 4, Terrace, St. Peter's St., Cambridge. [X1108]

**B.S.A.**, 1916, all-chain drive, 3 speeds, ridden 300 miles, Stewart horn; £60.—Bond, 245, 247, Euston Rd., N.W. [X2068]

**B.S.A.**—Immediate delivery from stock, models H and K; first cheque secure.—Alexander's, 115, Lothian Rd., Edinburgh. [X9978]

**1913 B.S.A.**, 2-speed, in perfect order; £32; guaranteed; easy payment arranged.—Jones, Garage, Muswell Hill, N. [X1213]

**B.S.A.**, 1914½, T.T. model, very little used; any examination, all accessories; £38.—Elston, 32, Brooke Rd., Stoke Newington, N. [X2147]

**B.S.A.**, late 1912, 3½ h.p., 2-speed, and coachbuilt sidecar, and accessories, in good condition; £37.—73, Emily St., West Bromwich. [X2184]

**B.S.A.**, 1914½, 3 speeds, countershaft, and coachbuilt sidecar, in real good order; £50.—Percy and Co., 337, Euston Rd., London. [X232]

**B.S.A.**, Latest 1916 Models.—Immediate delivery from stock at the Colmore Depot's London Agency, 44, Finsbury Pavement, E.C. [X792]

**B.S.A.**, 1914, countershaft, belt and chain, 3-speed, speedometer, lamp, horn, in splendid condition; £43/10.—Carter, 60, High St., Grays. [X9920]

**3½ h.p. B.S.A.**, T.T. model, late 1912, 2-speed gear, Lucas lamp, horn, accessories; £27.—Hallas, 37, Beech St., Paddock, Huddersfield. [X1734]

**1915½** Chain-cum-belt B.S.A., sidecar, every conceivable fitting, dynamo lighting, perfect condition; £78, cost £107; any time.—77, Hammersmith Rd., W. [X9965]

**B.S.A.**, 1916, 4½ h.p., model K, just delivered, chain-cum-belt, 3 speeds, kick starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton. [X2164]

**LATE 1913** (new 1914) B.S.A., 2-speed, coach sidecar, complete accessories, spares, condition perfect, mileage 3,500; real bargain, £42/10.—C.P., 58, Limes Ave., New Southgate. [X1016]

**1915½** B.S.A. Combination, hood, wind screen, lot spares, chain, beam little used, P. and H. lamp set; £62, or near offer; owner bought car.—Upton, Brentwood, Essex. [X2115]

**B.S.A.**, 1915½, all chain combination, absolutely new condition, finest accessories, hood, screen, grid, etc.; sacrifice, 68 gns.—Hynard, Draper, Askew Rd., Shepherd's Bush. [X1065]

**3½ h.p. B.S.A.**, 1913, 2-speed, free engine, Canoelet 32 coachbuilt sidecar; trial; £45, or exchange for 4½ h.p. B.S.A. and sidecar with cash adjustment.—Box 80, c/o The Motor Cycle. [X2233]

**LATE 1913** Clutch Model B.S.A., overhauled by makers, 2 new tyres, new belt, lamps, good as new, and cash, for twin combination; sell £32/10.—Walton's, Dawson Sq., Burnley. [X2070]

**B.S.A.**, promptest delivery, models H and K, and No. 1 sidecar; deferred payments by mutual arrangement; liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X1170]

**B.S.A.**, 1915½, 4½ h.p., 3-speed countershaft, chain drive, list accessories, unspratched, 50 gns., lowest; also splendid sidecar, hood, screen, luggage grid, 10 gns., lowest.—Foucar, 8, Carysfort Rd., Crouch End. [X1061]

**B.S.A.**, 1915, 4½ h.p., 3-speed, chain drive, Lucas dynamo lighter set, and Model de Luxe sidecar, upholstered in Bedford cord; £75.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X2289]

**B.S.A.** 1916 Models in stock; 4½ h.p., 3-speed countershaft gear, chain drive, model H, £64; chain-cum-belt model K, £62; B.S.A. sidecars, £16; special exchange, or extended payment terms quoted.—Elice and Co., 15-16, Bishopsgate Ave., Camomile St., E.C. [X0480]

**B.S.A.**—New 1916 models from stock; inspection cordially invited. All-chain drive £64, chain-cum-belt transmission £62, fitted with B.S.A. countershaft gear, free engine, and kick starter; B.S.A. sidecars to fit, £16; gradual payments entertained; second-hand machines taken in exchange; generous allowance; tuition and free delivery. Buy from B.S.A. appointed agents. Phone: Holborn 5777. When dealing with Wauchope's, purchasers can deal with confidence.—Wauchope's, 9, Shoe Lane, Fleet St., London (just off Ludgate Circus). [X2200]

## Calcott.

**CALCOTT**, Gamage 1914, 2½ h.p., lamps, horn, splendid condition; any trial; £17.—Specer, Elythorne, Dover. [X9997]

## MOTOR CYCLES FOR SALE.

## Calthorpe.

1915 Calthorpe-Jap. 2-speed; first cheque £24 secures. —Briggs, Motors, Wellingborough. [X2315]

CALTHORPE-J.A.P., 1915½, 2-speed, perfect; 26 gns. —32, Comeragh Rd., West Kensington. [X1205]

1915 2-stroke Calthorpe, 2 speeds, complete, lamps, etc.; £25.—Cross, Jeweller, Rotherham. [X2169]

CALTHORPES—2-stroke and J.A.P. models in stock. Trade supplied.—Alexander's, 115, Lothian Rd., Edinburgh. [X9979]

CALTHORPE.—Latest 2-speed lightweight models in stock; cash or exchange.—Eagles and Co., High St., Acton, W. [X2165]

2½ h.p. Calthorpe, overhead valves, 1915, 2-speed countershaft, new condition; £24.—Dickens, 29, Camelford St., Brighton. [X1011]

1915 Calthorpe-Jap, 2-speed Enfield gear, includes all accessories; £27/10; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X2196]

CALTHORPE Junior, 1914, 2½ h.p., 2-speed, lamp, horn, tools, just overhauled; £19/10.—D. J. Shepherd and Co., Enfield Highway. [X9904]

1915 Calthorpe, 2½ h.p. J.A.P., Enfield 2-speed gear, first-class tyres, Pedley belt; £28/10.—Robinson's Garage, Green St., Cambridge. [X8666]

CALTHORPE: Big value for little money.—Every model in stock at the Colmore Depot's London Agency, 44, Finsbury Pavement, E.C. [X9793]

CALTHORPE 2-stroke, 2-speed, quite new, but slightly shop-soiled; special bargain, £28.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [X9955]

CALTHORPE-J.A.P.'s, three only, new 1915 models, at 10% discount. Write or call and secure one to-day.—Colmore Depot, 261, Deansgate, Manchester. [X9958]

CALTHORPE-J.A.P., 2½ h.p., Enfield, 2-speed, quite new, but slightly shop-soiled; special bargain £32/15.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [X9954]

1914 Calthorpe Junior, 2-speed, in first-class running order; £16.—Tuke and Bell, Ltd., Motor Department, Carlton Engineering Works, High Rd., Tottenham, N. [X9878]

CALTHORPE Motor Cycles, 1916 Models.—Just arrived: 2-stroke 2-speed 31 gns., J.A.P. 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [X0777]

CALTHORPE and Wicker Sidecar, 4½ h.p., Precision engine, 2-speed, chain-cum-belt drive, frame and tank re-enamelled and lined by makers, engine and gear box overhauled; £43.—Heath and Wiltshire, Ltd., Bordon, Hants. [X1937]

CALTHORPE.—1916 new lightweights from stock, improved design, fitted with J.A.P. engine and Enfield 2-speed gear, £37/16; identically the same machine without 2-speed gear, £32; 2½ h.p. 2-stroke 2-speed model, £32/11.—Wauchope's, 9, Shoe Lane, Fleet St., London. [X2201]

## Campion.

CAMPION, 2½ h.p., 2-speed, 2-stroke, Villiers, Amac, Dunlop tyres, belt, horn, Stewart speedometer, only run 300, excellent condition throughout; cost over £40, £35.—Font House, Netherwiton, Morpeth. [X1729]

## Chater-Lea.

CHATER-LEA No. 7 Combination and dickey seat, coachbuilt, all on; £50, bargain.—Leighton's, opposite Wood Green Station. Phone: 471 Palmers Green. [X1227]

## Clyno.

CLYNO, 1912, 5-h.p., 2-speed, in perfect condition; £30, no offers.—52, Callcott Rd., Brondesbury, N.W. [X1142]

CLYNO, 1912, and sidecar, fitted Cowey, Lucas sets, head, etc., guaranteed; £36/10, or exchange.—Bishop, Wednesfield. [X2062]

## Connaught.

CONNAUGHT Popular, 1916, single and 2-speed in stock.—Williams, Chapel Ash Depot, Wolverhampton. [X2177]

## Coventry Eagle.

COVENTRY Eagle.—All models from £36/15 to £92/8; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [X9240]

## Douglas.

DOUGLAS, 2½ h.p., V, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½ h.p., U, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½ h.p., W, 3-speed, clutch, in stock; £56/14.

DOUGLAS, 2½ h.p., X, ladies', kick start, in stock; £56/14.

DOUGLAS, 2½ h.p., War Office model, in stock; £54/12.

DOUGLAS, brand new, models U, V, W, and X, in stock, with C.A.V. magnets, at rock bottom net cash prices; lists on application. Douglas specialists, Tel. 388, T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [X6864]

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100 & 136 Gt Portland St. London W.

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## LIST OF EX-STOCK BARGAINS.

Exchanges and Easy Payments.

## 1916 MODELS.

ALLDAYS-ALLON, single-speed	£34 0
ALLDAYS-ALLON, 2½ h.p., 2-speed	£42 0
ALLDAYS-ALLON, 2-speed, and clutch	£45 0
SUN-VILLIERS, 2½ h.p., single-speed	£30 10
SUN-VILLIERS, 2½ h.p., 2-speed	£37 0
JAMES, 2½ h.p., 2-speed	£38 11
NEW RYDER, 2½ h.p., 2-speed J.A.P.	£33 12
ZENITH, 4-5 h.p., countershaft	£73 18
B.S.A., 4½ h.p., 3-speed, all-chain	£64 0
B.S.A., 4½ h.p., ditto, chain-cum-belt	£62 0
ENFIELD, 6 h.p., Comb., elec. equip	£105 0
CALTHORPE, 2½ h.p., 2-sp., 2-stroke	£32 11
SUNBEAM, 3½ h.p., 3-speed	£73 10
SUNBEAM, 8 h.p., Combination	£126 0
INDIAN, 5 h.p., 3 speeds, Model B	£70 0
INDIAN, 7 h.p., 3 speeds, Model C	£78 0
ENFIELD, 3 h.p., 2-speed, T.T.	£25 10
ENFIELD, 6 h.p., Combination	£89 6
LEVIS, 2 h.p., Popular model	£28 1
B.S.A., 4½ h.p., and No. 2 Sidecar	£20 18
ENFIELD, 6 h.p., electrical model	£105 0
MORGAN, 8 h.p., de Luxe, all equip.	£117 18 3
ROYAL RUBY, 2½ h.p., lady's, 2-sp.	£38 0
ROYAL RUBY, 2½ h.p., 2-sp., 2-stroke	£36 10
COVENTRY EAGLE, 2½ h.p., 2-speed	£36 15
COVENTRY EAGLE, 2½ h.p., 2-speed	£44 2
CALTHORPE-J.A.P., 2½ h.p., 2-speed	£38 17

A number of new 1915 machines to clear at a reduced price. Full particulars upon request.

## SECOND-HAND.

## SIDECAR MODELS.

SUNBEAM, 8 h.p., 1914, 3 speeds	£85
HARLEY-DAVIDSON, 8 h.p., 1915, 3-sp.	£65
REX, 1914 (late), 3 speeds, 6 h.p.	£52
REX, 6 h.p., 1914, 2 speeds, de Luxe	£46
B.S.A., 4½ h.p., 1915, 3 speeds	£68
TRIUMPH, 1911, 3½ h.p., clutch, and Sc.	£22
BAT, 1913, 6 h.p., 3 speeds, and Sidecar	£52
MOTOSAGOCHE, 6 h.p., 1915, sporting Sc.	£65

## SOLO MOUNTS.

SPARKBROOK, 1915, 2-speed, 2-stroke	£28
LEVIS, 1914, 2-speed, 2-stroke	£24
RUDGE, 1914, 3½ h.p., T.T., Multi	£42
ALLDAYS-ALLON, 1916, 2-stroke, 2-speed	£40
KERRY-ABINGDON, 3½ h.p., 2 speeds	£22
REX, 3½ h.p., vertical engine	£6
REX, 1909, 3½ h.p., 3-speed, handle start	£21
ENFIELD, 1915, 3 h.p., T.T., 2 speeds	£42
INDIAN, 1914, 7 h.p., T.T., clutch	£42
F.N., 1912, 2½ h.p., 2-speed, shaft drive	£17
INDIAN, 1914, 7 h.p., electric equip., 2-sp.	£48
P. & M., 1913, 3½ h.p., 2-sp., handle start	£40
VELOCETTE, 1915, 2½ h.p., 2-sp., 2-stroke	£32
ZENITH, 1913, 3½ h.p., clutch	£38
DIAMOND, 1914, 2½ h.p., 2 speeds	£30

## LIGHT CARS, &amp;c.

1916 MORGAN de Luxe, hood, screen, side lamps, rear lamp, mechanical horn.	Price £117 18 3
STANDARD, 9.5 h.p., 1914, all equipment, as new, dickey	£188
RALEIGH, 1916 (new), 11 h.p., full equipment, electric light	£219
DEEMSTER, 1915, 10 h.p., dynamo lighting, 5-seater	£185
WARNE, 9 h.p., 1914, only used for demonstrations, all equipment	£85
OVERLAND, 1916, Model 86, electric light and starter, 5-seater	£200
CADILLAC, 1914, 20 h.p., 5-seater, electric equipment and self-starter, excellent order	£250

MOTOR CYCLES, SIDECARS, or CARS accepted in part payment for any of the above.

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## MOTOR CYCLES FOR SALE.

## Douglas.

DOUGLAS, very fast, T.T. 1913 model, exceptionally good; £35.—Bunting, Harrow. [X1043]

DOUGLAS, 1913, 2½ h.p., 2-speed, perfect condition; £33.—Victor, 80, Huntley St., W.C. [X1021]

1912 Douglas, 2-speed, free engine, kick starter; £25.—Briggs, Motors, Wellingborough. [X2317]

DOUGLAS.—Immediate delivery all 2½ h.p. models.—Alexander's, 115, Lothian Rd., Edinburgh. [X9980]

DOUGLAS Machines from stock, model V's immediate delivery.—Wauchope's, 9, Shoe Lane, London. [X2202]

1910 Douglas, in good running order, guaranteed; a snip, £13/13.—Jones, Garage, Muswell Hill, N. [X1212]

DOUGLAS, 1914, 2 speeds, lamps, etc., nice machine; £34.—11, Luna Rd., Thornton Heath. [X1148]

DOUGLAS, 2½ h.p., model U, late 1914, perfect condition; £37.—21, Cavendish Place, Newcastle. [X2325]

1914 Douglas, 2 speeds, footboards, perfect, little used; £33/10.—Stocks, Thurlstone, Penistone. (D) [X2242]

DOUGLAS, 2½ h.p., new tyre and belt; seen running; a great bargain, £15/10.—Speechley, 45, Church Rd., Acton. [X1223]

1915 Douglas, T.T. 2½ h.p., 2-speed, almost new, done 2,000, everything on; £45.—Pryor, Abbey Ruins, Bury St. Edmunds. [X1731]

DOUGLAS 2½ h.p. Twin, mag., Amac, h.b.c., perfect condition; £12, or near offer.—145a, Fulham Palace Rd., London, W. [X1054]

1914 2½ h.p. Model W Douglas, Lucas lamp and horn, speedometer; £44; splendid condition.—Brook, Motors, Burnham, Som. [X9889]

2½ h.p. Douglas, perfect condition, just overhauled; 24 spares, lamp, and horn; £20.—Thompson, 20, Balaclava Rd., Cardiff. [X9696]

DOUGLAS, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas.—Moffat, Yeovil. Tel.: 50. [X9203]

IMMEDIATE Delivery Douglas 1915 2½ h.p. models. Order now for 1916 models from Gibb, Gough, Douglas Depot, Gloucester. [X1139]

DOUGLAS War Office Model, new, 2-speed; £54/12; immediate delivery.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [X9957]

DOUGLAS, just re-hored, perfect compression, thoroughly overhauled; £16.—Perry, 23, St. Martin's Rd., Lower Edmonton, Middlesex. [X1003]

1913 Douglas, 2-speed, Bosch, lamps, etc., in good going condition; £25.—Gunn, W. Howard, 8th Light Armoured Car Battery, Bisleigh. [X1735]

1915 Colonial Model 2-speed Douglas, all accessories, fine condition; £45.—Cpl. Roberts, Royal Engineers, Beaumont Barracks, Aldershot. [X2111]

4 h.p. 1915 Douglas, 3-speed, with Milford sidecar, Watford, watch, and numerous spares, as new; £62.—Stacey, bottom of Ecclesall Rd., Sheffield. [X2221]

DOUGLAS Model U, new, 3-speed gear and free engine; £52/10; immediate delivery.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [X9956]

DOUGLAS.—Call and see the new machines, which are actually in stock at the Colmore Depot's London Agency, 44, Finsbury Pavement, E.C. [X9794]

1914 Douglas, model W, kick-start, clutch, Dunlop tyres, good belt, perfect condition throughout; £34/10.—Robinson's Garage, Green St., Cambridge. [X6867]

1914 (Xmas) Douglas, 2-speed, clutch, new Dunlop tyre, lamps, spares, fast; owner going overseas; £40.—Mattison, 3-15th Londons, Hazeley Down, Winchester. [X2148]

1913 Douglas, 2-speed, clutch, kick starter, in excellent condition; £32.—Tuke and Bell, Ltd., Motor Department, Carlton Engineering Works, High Rd., Tottenham, N. [X9877]

DOUGLASES, promptest delivery all models, cash or deferred payments; also 1913, 2-speed, kick starter, 35 gns.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X1176]

DOUGLAS.—Immediate delivery models U, V, W. Book your orders now from the sole agent for Anglesey and Carnarvonshire. Tel.: No. 5.—Jones, Anglesey Motor Mart, Llanfairpwll. [X9486]

DOUGLAS, 1914 model, 2½ h.p., clutch, and 2 speeds, purchased in May, but only used for 4 months; price £40; can be seen or tried here; property of R.N.V.R. officer.—G. L. Kennedy, Naval Base, Poole. [X9860]

DOUGLAS 1911, 2½ h.p., Bosch, lamp, horn, Brooks large saddle, all accessories, engine overhauled, new piston fitted, over 120 to gallon, carefully used, hardly scratched, genuine; honest bargain, 17 gns.—4, Park Terrace, Farnham. [X9909]

## Dunkley.

DUNKLEYS.—All models from £35 to £89/5; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Meers, Green Taxis, Villiers St. Garage, Charing Cross, London. [X9238]

## Enfield.

ENFIELD 2-stroke, 2-speed, run 500; £35.—Williams, Monfa, Towyn, Merioneth. [X2066]

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## NEW MACHINES IN STOCK.

2½ h.p. A.J.S., sporting model .....	£58 0
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7 h.p. INDIAN (powerplus) and Sidecar ..	£101 10
3½ h.p. T.T. ROVER, Philipson pulley ..	£56 0
2½ h.p. A.J.S., Model B .....	£58 0
3 h.p. ENFIELD, T.T. ....	£52 10
T.T. IXION .....	£28 10
JAMES, 2-speed .....	£38 10
Lady's METRO, 2-speed .....	£38 10
ROYAL RUBY .....	£29 10
HOBART, 2-speed .....	£38 10
SPARKSBROOK, 2-speed .....	£40 0
EXCELSIOR, single-gear .....	£30 16
OMEGA, 2 speed, 3 h.p. ....	£39 18
OMEGA, single-gear .....	£31 10
OMEGA, 2½ h.p. J.A.P., 2-speed .....	£39 18
Lady's IXION, 2-speed .....	£38 0

## SECOND-HAND MACHINES OVERHAULED.

1914 2½ h.p. PRECISION, 2-speed, T.T. model .....	£27 0
1915 IVY, 2-stroke, practically new ..	£22 0
1914 4 h.p. 3-sp. TRIUMPH, only done 2,000 miles .....	£48 0
T.T. BRADBURY, 4 h.p., complete, fine order .....	£28 0
1914 3½ h.p. HUMBER, 3-speed, coach-built Sidecar, Lucas lamps, etc. A bargain .....	£40 0
1913 6 h.p. clutch REX. A real goer ..	£25 0
1913 3½ h.p. TRIUMPH, 3-speed, coach-built Sidecar .....	£48 0
1913 6 h.p. 3-speed A.J.S. and coach-built Sidecar, lamps, etc. ....	£60 0
1910 3½ h.p. TRIUMPH, fine order .....	£22 0
1908 3½ h.p. TRIUMPH .....	£19 0
1911 TRIUMPH, just renovated .....	£25 0
1910 2½ h.p. ENFIELD, twin, mag., etc. ..	£13 10
1915 MORGAN, sporting model body, lamps, hood, screen. A bargain ..	£75 0

## SECOND-HAND SIDECARS.

1 Light Wicker Sidecar, fits Triumph .....	£3
1 Art Can Sidecar, fits Triumph .....	£3
1 Art Can, practically new .....	£5
1 Coach-built, room for child in front, practically new .....	£6
1 INDIAN Wicker Sidecar, red and black, nice condition .....	£6
All the above are complete with tyres.	

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## MOTOR CYCLES FOR SALE.

### Enfield

ROYAL, Enfields, 1915, second-hand 6h.p. combination, from £70; trial run.—Below.

ROYAL, Enfields, new 1916 combinations; £89/5, in stock; exchanges; beginners taught free.—Below.

ENFIELD 8h.p. Combination in stock, just arrived; £291/7.—Smith's Garage, Conisborough. [X2059]

ENFIELD, 3h.p., 1916, brand new; £2 under list.—Heathcote, Beacon View, Rottingdean, Sussex. [1103]

1916 8h.p. Enfield Combination in stock; easy payments arranged.—Jones, Garage, Muswell Hill, N. [1216]

ENFIELD, 2½h.p., new tyre, lamps, horn, tools; 14 gns.—Troward, Heathurst, Vale, Hampstead. [1242]

ENFIELD Combination, just overhauled, perfect condition, as new; £50.—29, Brathway Rd., Southfields [19989]

ENFIELD 1915 Combination, 6h.p.: a bargain. £69.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [19963]

ENFIELD, 1915, 3h.p. twin, 2-speed, free engine, perfect condition; £45, or nearest.—Olliff, Newcastle-on-Tyne. [X2306]

ENFIELD, 1916, 3h.p., just arrived from works; £52/10.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [19962]

IMMEDIATE Delivery Enfield Combination, at works, fitted 700×80 tyres all round; cash offers.—152, North Rd., St. Helens. [X2250]

1914 6h.p. Royal Enfield Sidecar Combination, complete with accessories; £59; guaranteed.—Wanchope's, 9, Shoe Lane, London. [X2203]

ENFIELD Combination, 1912, 6h.p., green cane sidecar, 1915 improvements, climbs anything; £40.—Aillard, 45, Ripley Rd., Belvedere. [1115]

ENFIELDS, 1916, actually in stock, 6h.p. combination, 85 gns.; 3h.p. 2-speed twin, 50 gns.—D. J. Shepherd and Co., Enfield Highway. [19902]

1916 8h.p. Enfield Combination, speedometer, lamps, complete, new December, done 200 miles; nearest £95.—Kershaw, Engineer, Liversedge. [X1935]

ROYAL Enfield, 1915, 3h.p., 2 speeds, and kick starter.—£38.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2299]

ENFIELDS.—All 1916 models in stock, ready to ride away; some special Enfield bargains presently in stock.—Alexanders, 115, Lothian Rd., Edinburgh. [19981]

1912 6h.p. Enfield, special wide coachbuilt sidecar to seat 2, accessories, etc.; £45, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [10722]

6h.p. Royal Enfield Combination, coachbuilt sidecar, used for pleasure only, exceptional condition; £42 cash; exchange 1915 Scott.—Else, Daisy Bank, Matlock. [X2116]

ROYAL Enfield Combination, 6h.p., done 2,000, complete, all accessories, including speedometer and exhaust whistle; price £67/10.—C. 46, Forest Rd., Kew Gardens. [1023]

ROYAL Enfields.—For Woolwich, Plumstead, Greenwich, Blackheath, Charlton, North Woolwich, and Silvertown, sole district agent, W. Hill, 20, High St., Woolwich. [X9387]

ENFIELD Combination, late 1915, as new, only run 500 miles, beautifully fitted up, hood, screen, lamps, etc., guaranteed perfect, and unscratched; £75.—Moss, Wem. [X2175]

ENFIELD 1913 Coachbuilt Combination, speedometer, electric lamps, every accessory, condition almost new; 50 gns.; exchange solo and cash.—84, Spring Bank, Hull. [X2145]

ENFIELD 1916 6h.p. Combination, delivery from stock, £89/5; special exchange, or extended payment terms quoted.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0481]

ENFIELD Combination, 6h.p. J.A.P. engine, chain drive, coachbuilt sidecar, speedometer, lamp and horn, excellent condition; any trial; £42.—The Premier Motor Co., Aston Rd., Birmingham. [1248]

ENFIELD 1915 8h.p. Combination, wind screen, Watford speedometer, Lucas head and tail lamps, complete, guaranteed sound; £72/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0552]

ROYAL Enfield, 3h.p., 1915, not ridden 250 miles, complete with all accessories, scarcely discernible from new, Palmers both wheels; price £42/10/6; good bargain.—Wanchope's, 9, Shoe Lane, London. [X2204]

ENFIELD, 1916, latest model, 2-stroke, 2½h.p., 2-speed, and free engine, chain drive, just arrived from works; immediate delivery; £42; make sure of this now.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [19960]

1916 Enfield 6h.p. Combination, Lucas dynamo set, screen, Watford's speedometer, Lucas horn; not done 200 miles, beautifully kept; cost £110 last month; best offer over £90 secures: buying car.—Apply, Kendall, Glesgowan, Station Rd., Thames Ditton. [1086]

ENFIELDS, 3h.p., 6h.p., and electric de luxe models in stock, also two 1914's, with all accessories; £65 each; deferred payments; exchanges.—To ensure satisfaction buy an Enfield from Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1168]

# 1916 MODELS actually in Stock

1916 2½ h.p. OMEGA J.A.P., 2-speed .....	38 gns.
1916 2½ h.p. OMEGA, 2-stroke, 2-speed ..	38 gns.
1916 8 h.p. British EXCELSIOR Combination, Jardine 4-speed gear .....	£98 0
1916 5-h.p. British EXCELSIOR, Sturmer countershaft 3-speed gear .....	68 gns.
1916 4½ h.p. British EXCELSIOR, Sturmer countershaft 3-speed gear .....	64 gns.
1916 4½ h.p. B.S.A., 3-speed, Model K ....	£62 0
1916 Grand Prix MORGAN No. 1, speedometer, etc. ....	£120 0
1916 Sporting MORGAN, all on .....	£109 0
1916 6 h.p. NEW HUDSON .....	72 gns.
1916 FORD Touring Car, 20 h.p. ....	£135 0
1916 FORD Chassis, 20 h.p. ....	£115 0
1916 FORD Van, 20 h.p. ....	£130 0
1916 20 h.p. FORD Ambulance .....	£135 0
1916 6 h.p. ENFIELD Combination .....	85 gns.
1916 6 h.p. J.H. Combination .....	90 gns.
1915 12h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on	£120 0

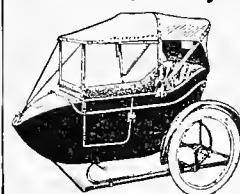
## SECOND-HAND BARGAINS.

2-speed RADCO, 2-stroke, fine condition ..	£25 0
2-stroke OMEGA, Druid forks .....	£19 0
1914 DOUGLAS, 2-speed, fine machine .....	£36 0
3½ h.p. N.S.U., spring frame, 2-speed .....	£17 0
3½ h.p. TRIUMPH, clutch model .....	£22 0
3½ h.p. 1908 TRIUMPH, fine goer .....	£17 0
5-0 h.p. twin BAT, J.A.P. engine, spring frame, rear cane sidecar, very smart ..	£12 0
1913 B.S.A., 2-sp., chain drive, kick starter, and smart coach-built Sidecar .....	£35 0
1915 2-sp. 2-str. NEW HUDSON, done 500 ..	28 gns.
3½ h.p. 1900 REX de luxe, 2-sp., handle st'g ..	£19 0
1913 FORD, English body, Bosch magneto, disc wheels .....	£84 0

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Underlung Chassis,  
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Hood £2 4s. Screen £1.



## NEW MOTOR CYCLE FRAMES.

Fully Guaranteed.

25/- each.

## ODD BARGAINS.

Light Cycle Car Chassis, new 26 × 2½ in. tyres, wheel steering, 2-speed gear box, tank, etc.; the lot £12. Tyres almost worth it.

New 050 × 05 Dunlop rubber-studded covers .. 22/6 |

8-10 h.p. Precision Engine, quite new. What offers?

6 h.p. Twin Antoine Engine, water-cooled. .... 26 0 |

8 h.p. J.A.P. Twin Engine, air-cooled ..... £12 12 |

New Binks Carburettor, motor cycle type ..... 35/- |

F.R.S. Lamp Set, 500 beam, shop-soiled ..... 35/- |

F.R.S. Lamp Set, 1,000 beam, shop-soiled ..... 45/- |

New Climber Clearance Covers, de Luxe, "heavy," rubber-studded, 26 × 2½, 26 × 2½, 26 × 2½, each ..... £1 0 |

Latest Mechanical Horn, black and nickel ..... £1 0 |

Cowey Speedometer, for 26 × 2½ wheel ..... £2 0 |

Cowey Speedometer, for Morgan ..... £2 5 |

Set of Miller's Cycle Car Lamps and Generator (new) ..... £2 0 |

Lukin Cycle Car Carburettor, new condition ..... 15/- |

Cox Cycle Car Carburettor ..... 10/- |

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Hopwood Lane, HALIFAX.



## MOTOR CYCLES FOR SALE.

## Enfield.

**ROYAL** Enfield New Combination, 6h.p. and 8h.p., chain-driven machines, fitted with handsome coachbuilt sidecar, countershaft gear and free engine, up-to-date turnout, complete with storm apron; 55 gns.; ignition free, and free delivery to any address within 50 miles of London; best terms for cash, exchange, or extended payments.—Wauchope's, 9, Shoe Lane, London. [X2205]

## Excelsior.

**1914** 7-9h.p. American Excelsior, coach sidecar, with hood, electric lamps, only used twice last summer; £57.—Finnish Seamen's Mission, Horseferry Branch Rd., Stepney, E. [1140]

## Fafnir.

**FAFNIR**, 3½h.p., Rex frame, B. and B. carburetter, coil ignition; £3/10; bought Enfield.—Ineson, Plumber, Heckmondwike, Yorkshire. [X2033]

## F.N.

**4-CYL. F.N.**, 2-speed, Senspray, just been done up; £19.-37, Furzehill Rd., Plymouth. [1195]

**F.N.**, 2½h.p., low build, mag., good tyres, splendid engine; cheap; £12.—Dixon, Biester. [X2054]

**F.N.**, 4½-5h.p., 4 cyls., mag., spring forks, fast; £12/15.-1, Ebner St., Wandsworth. [X2266]

**F.N.**, 5-6h.p., practically new, 4-cyl., clutch, Bosch; selling for rent; best offer over 20 gns.—Beardshaw, Auctioneer, Wood Green. [1118]

**F.N.** 7h.p. Motor Cycle, 4-cyl., and coachbuilt sidecar, all complete, condition perfect; privately owned.—Particulars, Box L737, c/o *The Motor Cycle*. [1005]

**F.N.**, 2½h.p., mag., lightweight, just fitted with a 3-speed hub (cost £10/10, in real good order; £14/14, a bargain.—Percy and Co., 337, Euston Rd., London. [1237]

## Harley-Davidson.

**HARLEY-DAVIDSONS** in Stock.—Premier Motor Co., Birmingham.

**MODEL 11J**, with dynamo electric lighting; £76/13, duty free.—Premier Motor Co., Birmingham. [18684]

**1916** Harley-Davidson, all models in stock.—Parker and Son, St. Ives, Hunts. [1160]

**4 h.p.** Harley-Davidson, 2-speed, shop-soiled, complete, lamps, and horn; £48.—Stacey, bottom of Ecclesall Rd., Sheffield. [X2222]

**HARLEY-DAVIDSON** Models in stock, complete with Gloria sidecar.—Turpin, 22 and 29, Preston Rd., Brighton. [0715]

**1915** 7-9h.p. Harley Davidson, 3-speed, and new Canelet sidecar, 1,500 miles, perfect; price £78.—Allan, West Park, Ayr, N.E. [X2150]

**HARLEY-DAVIDSON**, 11F, 1915, Millford Empress sidecar, 5in. tyre; seen any time; £70.—Phillips, 8, Grand Parade, Harringay, London, N. [1050]

**1915** Harley-Davidson, 4h.p., 2-speed, and £15/15 Canelet sidecar, guaranteed perfect, unpunctured; £54.—Box L668, c/o *The Motor Cycle*. [9852]

**1916** Harley-Davidson and Swan sidecar, model 11J, only been run on the road 3 weeks; owner gone to the front; £100.—Brook, Motors, Burnham, Som. [9891]

**HARLEY-DAVIDSONS**—Immediate delivery of 1916 models.—Sole agent for Sheffield, Worksop, and Doncaster, Stacey, bottom of Ecclesall Rd., Sheffield. [X2223]

**HARLEY-DAVIDSON** Combination, shop-soiled, model 11J, with dynamo lighting set, and Canelet sidecar; a bargain for cash; offers.—Parkin, City Garage, Worcester. [9924]

**HARLEY-DAVIDSON**, delivered October, 1915, with coachbuilt Bramble sidecar, lamps, Stewart mechanical horn, P. and H. lamp set, used by officer for fortnight; cost over £100, accept £85.—Parker and Son, St. Ives, Hunts. [1164]

**HARLEY-DAVIDSON**—For careful attention to your requirements, and best terms, get in touch with the firm who introduced the "Silent Grey Fellow" in the Midlands. A few models 11J, with electric dynamo lighting equipment, head lamp, tail lamp, and horn, free of duty. £76/15. Buy now and save money.—The Premier Motor Co., Acton Rd., Birmingham. [8685]

## Henderson.

**HENDERSON**, 913, single gear; £40.—Earl, 5, Heath St., Hampstead. [X2191]

**HENDERSON**, 4-cyl., 2-speed, model E. absolutely new; 78 gns.—Taylor's Garage, Penzance. [X2118]

**10 h.p.** Henderson Combination, 4-cyl., luxurious, electric light, new, delivered end 1915, few miles; reasonable offer.—193, Rosendale Rd., Dulwich, London. [1231]

**HENDERSON**, 1915, 4-cyl., brand new, with 20 in. sidecar, only shop-soiled; this outfit now going complete for £22.—Alexander's, 115, Lothian Rd., Edinburgh. [9982]

**1915½** 4-cyl. Henderson, Millford sidecar, accessories, done 2,200 miles, perfect condition; 80 gns.; leaving England.—Parkin, 38, Gibbon Rd., Kingston-on-Thames. [1036]

**HENDERSON**, new November, 1915, D.A. cylinder, 14 in. lamps and horn, Gloria coachbuilt sidecar; cost £110, scarcely used; £90.—Harold Wareing, 182, Portland St., Southport. [X2182]

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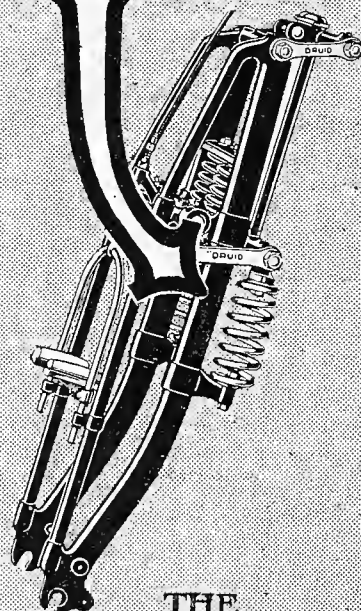
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## MOTOR CYCLES FOR SALE.

## Hobart.

**24 h.p.** Hobart, 1915 (late), 2-stroke, 2-speed counter-shaft, speedometer, etc., as new; £27.—Field, 12, Belmont St., Brighton. [1012]

## Humber.

**3½ h.p.** Humber, 2-speed, free engine, handle starter; any trial; £24.—18, Edward St., Brighton. [1014]

**1913** 2h.p. Humber-Centaur, really splendid condition, lamp, etc.; £14.—Toms, Catherine St., Leicester. [X2158]

**1913** Humber Lightweight, in new condition; £17, or exchange for 3½h.p.—101, Maybury Rd., Woking. [9953]

**3½ h.p.** 1912-13 2-speed Humber and sidecar, good condition; £26.—Chapman, 26, Highbridge St., Waltham Abbey. [1126]

**HUMBER**, 2½h.p., good condition, needs valve; sacrifice £5; good hill-climber.—Boyack, 143, Victoria Rd., Dundee. [X2190]

**HUMBER**, 1911, 3½h.p., 2-speed, and sidecar, speedometer, and accessories, thoroughly sound; £25.—Smith, 6, Jennings Rd., Oswestry, Salop. [1116]

**HUMBER**, 3½h.p., 2-speed, free engine, new Dunlop belt, lamps, tools, etc., just overhauled; £23, or near offer.—Taylor, 29, Cecil Rd., Ilford. [X2117]

**HUMBER**, 1912, 3½h.p., N.S.U. gear, cane sidecar, 1915, lamps, horn, all accessories, in perfect order; 30 gns.; trial any time.—168, Archway Rd., Highbury. [9985]

**24 h.p.** Twin Humber, 1914 T.T. speed model, Stewart speedometer, lamps, horn, knee-grips, spare pulley, belt, valves, fast, condition as new, under 2,500 mileage; bargain, £27, or nearest.—Fenton, Fore St., Ipswich. [9921]

## Indian.

**1916** Indians, all models in stock.—Parker and Son, St. Ives, Hunts. [1161]

**INDIAN C.B.** Combination, 2 speeds, condition like new; £42.—Slack's Garage, Stockport. [X1452]

**INDIAN**, 1915, new, but shop-soiled, 3½h.p. twin, 3-speed; £50.—Dan Guy, Weymouth. [1075]

**5 h.p.** 3-speed Indian, Bramble sidecar to match; £70.—Parker and Son, St. Ives, Hunts. [1162]

**1915** Indian, 7-9h.p., clutch model, very fast, in splendid condition; £50.—Brook, Motors, Burnham, Som. [9890]

**INDIANS**—All latest models in stock, with or without sidecars.—Alexander's, 115, Lothian Rd., Edinburgh. [9983]

**NEW** 1916 Power Plus Indian, 7h.p., 3-speed; bargain, £70; don't miss this.—Box 12, c/o *The Motor Cycle*. [X1059]

**INDIAN**, 5h.p., late 1915, 3-speed, lamps, etc., only ridden a few hundred miles; £50.—Longman Bros., King St., Acton. [9684]

**1915** Indian, 5h.p., done 1,000, new condition, speedometer, lamp, horn; £48.—Flewitt, 193, Aulsefield Rd., Nottingham. [1121]

**INDIAN** 1914 7-9h.p. Combination, 2-speed, kick start, hand clutch, mileage 1,800; £56.—25, Hatteridge Lane, Childs Hill. [1100]

**7 h.p.** Indian Combination, 1914, electric equipment, splendid condition; 50 gns.—54, Wellington Rd., St. John's Wood, London. [X2061]

**INDIAN**, 1915, almost new, run 1,400 miles, 3 speeds, coachbuilt Indian sidecar; £60.—Percy and Co., 337, Euston Rd., London. [1238]

**INDIAN**, 1915, 5h.p., 3 speeds, De Luxe sidecar; £68.—Eastern Garage Co., 418, Roumford Rd., Forest Gate, E. Phone: East Ham 490. [X2291]

**1915** 7-9h.p. Indian (new August), spring frame, electrically equipped, speedometer, under 1,000, like new; £58.—Freedman, Penygraig, Glam. [9681]

**1915** (July) 7h.p. Indian, 3-speed, Millford £20 sidecar, tyres and condition as new, 1,000 miles only; offers.—Box L743, c/o *The Motor Cycle*. (D) [1018]

**INDIAN**, 7h.p., 1914, Millford sidecar, 2 speeds, electric lighting, speedometer, unprecedented bargain, £49.—C.R., 28, Elm Grove, Hammersmith. [9951]

**MOTOR CYCLE**, Indian, 3½h.p., 3-speed, lamp, all accessories, almost new, excellent condition; £46; appointment.—Box L725, c/o *The Motor Cycle*. [9950]

**1915** (late) 7-9h.p. Indian, 3-speed, kick starter, T.T. bars, new, never on road; officer cannot use owing wounds; in crate; £60.—Dowler, Cranleigh. [9905]

**7 h.p.** Indian, 1914 model, fitted with De Luxe sidecar, 2-speed gear, and free engine, electric lighting set, electric horn, spring frame; price £55; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X2206]

**1912** Twin Indian, 7-9h.p., blue, 2-speed, clutch, in splendid mechanical condition and good appearance; owner enlisted; £28 cash.—Dickenson, Produce Merchant, Gt. Nelson St., Liverpool. [1151]

**INDIAN**, 7-9h.p., 1914, and sidecar, 2-speed, electric set, electric horn, speedometer, and kick start; £50, or offer, or exchange smaller power and cash.—Mills, The Pirs, Spaniards Rd., Hampstead. [9994]

**1916** Power Plus Indian, 3-speed, and sidecar, £96; also 1916 5h.p. 3-speed model, £70; both the above machines in stock.—Julian, Broad St., Reading. [1024]

Biggest motor cycle dealer in the South. Phone: 1024. [X1591]

MOTOR CYCLES FOR SALE.

Rex.

6 h.p. Twin Rex, spring forks, watertight Bosch, Amac, accessories—give trial; £12/10.—125, Canal Rd., Mile End, E. [9922]

1913 Rex and Sidecar, good order; £38; guaranteed; easy payments arranged—Jones, Garage, Muswell Hill, N. [1215]

6 h.p. Twin Rex and coachbuilt sidecar, complete, perfect, owner engineer; £23, worth £35.—Stacey, 12, Ecclesall Rd., Sheffield. [X2227]

REX Sidette, 6 h.p., 1913, 2-speed, lamp, generator, tyres new condition, good running order; £32.—Lyons, Grange, Emberton, Newport Pagnell. (D) [X2036]

REX Combination, 1912, 5-6 h.p., 2-speed, free engine, splendid order, not been used for 12 months; bargain, £32.—Elce and Co., 15-16, Bishopsgate Ave., Camomile St., E.C. [0599]

REX, 1911, 3½ h.p., Bosch, F.E. and B., Badcock's by-pass, N.S.U. 2-speed, F.E., handle starter, wicker sidecar; £26, or exchange, with cash, higher power; photo.—179, Osmaston Rd., Derby. [X2239]

FOR Sale, Rex 3½ h.p. motor cycle, good condition, Kerry free engine, fully ridden about 400 miles, re-bushing, and new valves; £20, or near offer.—W. Hill, 45, Barrack Rd., Stoughton, Guildford, Surrey. [9869]

5-6 h.p. Twin Rex, late model, 2 speeds, free engine, Bosch mag., B. and B. carburettor, P. and H. Lamp, Lycett's pan seat, Stewart speedometer; nearest 147/10 secures; owner enlisted.—90, Burton Rd., Lincoln. [X2162]

REX, latest model, 6 h.p., with coachbuilt sidecar, never used, owner called on active service before delivery; £75, cost over 120 gns.; seen by appointment only.—Lewis, Fairlight Lodge, 121, Ilighbury New Park, London, N. [0768]

6 h.p. Rex, 1913½, special sidecar, 2-speed, handle starting, Bosch mag., new car wheel and Roc gear, 5 Lucas lamps, horn, watch, jack, 2 Service belts, spares, tools, nearly new tyres; any trial; owner bought car; best offer over £40.—Cox, Parkdene, Weston-super-Mare. On view Mackness' Garage, Chippenhams. [X2032]

Rex-Jap.

REX-J.A.P. Combination, 1912, 6 h.p., 2 speeds; £38.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2295]

REX-J.A.P., 4 h.p. twin, 1913, in very good condition, Cowey, head lamp, horn, tyres good; £30, no offers.—Mann, 13, Benson St., Liverpool. [X1931]

Rover.

1914 3½ h.p. 3-speed Clutch Rover, all accessories, 2 new tyres; £38, offers.—Stanton, 55, Bostons Road, Hounslow, Middlesex. [9872]

ROVER, 1913, 3½ h.p., 3-speed, clutch, excellent condition, lamp, etc., spares and tools; £35.—Lieut., Loxden, Goldsworth Rd., Woking. [X2108]

LATE ROVER, 3½ h.p., 3-speed, clutch, all accessories, excellent condition; bargain, £26, or nearest.—Pooley, 1, Wastdale Rd., Forest Hill. [1096]

ROVER 4 h.p. Combination, practically new, run 1,000 miles, guaranteed fully equipped; 55 gns.—Percy and Co., 337, Euston Rd., London. [1239]

ROVER, 1913, 3½ h.p., 3 speeds, clutch, good tyres, lamp, horn, speedometer, spare belt, 2 tubes, plug, valve tools, perfect order; £30.—9, Beauchamp Rd., Upper Norwood. [1198]

ROVER, late 1915, 3½ h.p., T.T. done 1,500, excellent condition, all accessories; officer leaving for front; 40 gns., or nearest offer.—Lt. Stiver, 9th K.S.L.L., No. 7 Camp, Whitechurch, Salop. [X2124]

ROVER 1916 Sporting Models in stock: 3½ h.p. T.T., with hand-controlled Philipson pulley, £56; exchange or extended payment; terms quoted.—Elce and Co., 15-16, Bishopsgate Ave., Camomile St., E.C. [0492]

1914 3½ h.p. Rover, footboards, 3-speed, lamp, horn, mirror, knee grips, and speedometer, good tyres, engine guaranteed, outward condition excellent; £42/10.—Robinson's Garage, Green St., Cambridge. [6865]

Royal Ruby.

ROYAL Ruby, 1915, 2-speed, 2-stroke, in real nice order; £23.—Percy and Co., 337, Euston Rd., London. [1233]

ROYAL Ruby.—Immediate delivery from stock of standard 2-stroke, £29/10; standard 4-stroke, with 2-speed gear, £39/10; a well-designed and beautifully finished lightweight at a moderate price.—The Premier Motor Co., Aston Rd., Birmingham. [1250]

Rudge.

3½ h.p. T.T. Rudge, fixed, very fast; £25.—Briggs, 32, Motors, Wellingborough. [X2316]

RUDGE, 3½ h.p., free engine, 1915, T.T. handle-bars, perfect condition; £30.—109, Park Rd., W. Dulwich. [1197]

3½ h.p. Rudge Multi, 1914 model, free engine, complete with all accessories; £35.—Wanchope's, 9, Shoe Lane, London. [X2212]

RUDGE Multi, 3½ h.p., 1912, fast, good condition, all accessories.—Thompson, 96, Elms Rd., Clapham Common, S.W. [1041]

RUDGE Multi, 1915, 3½ h.p., condition as new, lamps and horn, service green enamel; £48.—Broad, Benson St., Liverpool. [X1932]



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B.S.A., Model H .....	£64 0
JAMES, 4 h.p., 3-speed Combination ..	£80 10
INDIAN, Model B and Sidecar .....	£85 15
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INDIAN, Model G .....	£75 0
NEW HUDSON, Big Six Combination ..	£78 15
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HARLEY-DAVIDSON, Model J .....	£89 0
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1912 B.S.A., clutch model .....	£30 0
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1914 CALTHORPE-J.A.P., 2½ h.p., 2-sp ..	23 gns.
1914 ROVER, 3½ h.p., 3-sp., and S'car ..	£45 0
1913-4 BAT-J.A.P., 8 h.p., and Sidecar ..	47 gns.
1916 NEW IMPERIAL, 2½ h.p., 2-sp., big tyres, done 300 miles .....	38 gns.
1915-6 NORTON, 4 h.p., 3-sp., Millford Sidecar .....	£65 0
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1913 ENFIELD, 6 h.p., 2-speed, Combination, all accessories .....	£45 0
1914 NEW HUDSON, Big Six, Comb'n ..	£59 10
1913 ZENITH GRADUA, 6 h.p., Combination, all accessories .....	£65 0

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MOTOR CYCLES FOR SALE.

Rudge.

RUDGE Multi 5-6 h.p. Combination, late 1913, speedometer, all accessories; £38, sacrifice.—Ravencroft, Woodhouse Lane, Ashton-on-Mersey. [X2246]

RUDGE Multi Combination, 1913, 3½ h.p., coachbuilt, hood and screen; £42.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2294]

RUDGE, 3½ h.p., 1912 model, free engine, tools, Avon steel-studded tyres, Zilla belt, horn, etc., guaranteed sound throughout; £36; wanted, 8 h.p. J.A.P.; particulars exchanged.—Box 79, c/o The Motor Cycle. [X2244]

RUDGE Multi, 1913, in perfect order, new carburettor, piston, and main bearing, rear wheel hub, belt and tyre, Lucas head light and horn, Smith speedometer, spare valves, springs, bolts, etc.; £30.—V.J., view Bingham's Garage, Portsmouth Mews South, Maida Vale, W. (next Maida Vale Tube Station). [X2161]

Scott.

SCOTT, 1912, Phoenix sidecar, lately overhauled by makers, in perfect condition and very smart; any trial; £38.—40, Brownhill Rd., Catford, S.E. [1034]

1913 Scott Combination, 1915 improvements, good tyres, all accessories, details on request; best offer over 42 gns.—Heythrop, Riverway, Palmer's Green. [X2256]

SCOTT, 1914 model, fitted with handsome coachbuilt sidecar, which includes all accessories; price £55; had but little use; guaranteed.—Wanchope's, 9, Shoe Lane, London. [X2195]

SCOTT 1913 Coachbuilt Combination, 1915 improvements, including Binks, drip lubrication, silencer, many others; £40, offer, or lower power and cash.—3, Victoria Mews, Victoria Rd., Clapham. [1069]

Singer.

SINGER Lightweight, fine condition, Bosch mag., B. and B. carburettor, low; £10.—Worley, Park Lane, Reigate. [X1733]

SINGER, new 4½ h.p., 2-speed, enclosed chain drive; accept £60 for spot cash.—Colmore Depot, 261, Deansgate, Manchester. [9940]

SINGER, 2½ h.p., late 1913, clutch, 2 speeds, splendid condition, run less than 3,000 miles; £30, or nearest offer.—J. Jones, Kildermorie, Highgate. [X2110]

SINGER, 4½ h.p., 2-speed countershaft, coachbuilt combination, speedometer, head lamp, horn, mileage only 2,700; £48.—Steele, Gienfeshie, Camberley. [X2185]

Sphinx.

6 h.p. Sphinx, Grado gear, free engine, and cane side-entrance sidecar, good running order; £9 lot.—29, St. Leonard's St., B'wy. [1199]

Star.

4½ h.p. 1915 Star, countershaft 3-speed, and coachbuilt sidecar; £62.—25, Sycamore Grove, Rugby. [X2321]

Sun.

SUN-VILLIERS Lightweight, shop-soiled only; £28 to clear.—Slack's Garage, Stockport. [X1453]

SUN-PRECISION, 1914, 2½ h.p., single-cyl., 4-stroke, 26x2in. Clincher Dreadnought tyres, free engine, Bosch mag.; a bargain, £20.—The Premier Motor Co., Aston Rd., Birmingham. [1249]

1916 2½ h.p. Sun V.T.S., 2-stroke, 2-speed, F.E., new from works Feb. 1st, perfect, not done 30 miles; cost £37, sacrifice £34; tools, lamp, registration certificate included.—F. G. Kennell, High St., Long Buckley. [X2127]

Sunbeam.

SUNBEAMS.—Several 1916 3½ h.p. motor cycles and sidecars in stock.—Coldham, Agent, Northampton. [X2263]

SUNBEAM, 1916—3½ h.p. combination and T.T. models in stock; 8 h.p. combination due March.—Moss, Weir. [X2173]

NEW 1916 3½ h.p. 3-speed Sunbeam, just delivered; modern Triumph taken in exchange.—Robbins, Garage, Rugby. [X2251]

1915 3½ h.p. Sunbeam and sidecar, electric lighting, purchased last August, grand condition; offers.—Moston, St. Edmund's Av., Porthill, Stoke-on-Trent. [X2247]

SUNBEAM, 3½ h.p. (1915), and coachbuilt Millars Enfield sidecar to match, as new, speedometer, screen, full equipment; £70.—1, Ashworth Mansions, Elgin Av., Maida Vale, W. [X2123]

Swift.

3½ h.p. Swift, good, sound machine, running splendid; £2; guaranteed.—Wanchope's, 9, Shoe Lane, London. [X2123]

T.D.C.

T.D.C. de Luxe, 2-stroke, 2-speed, new.—Marshall, Castle St., Cambridge. [9555]

BRAND New T.D.C. 2-stroke, 2-speed countershaft, never been ridden; 26 gns.—Troward, Heathfield, Vale, Hampstead. [1245]

DE LUXE T.D.C., 2½ h.p. in stock; immediate delivery; £24.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [9988]

## MOTOR CYCLES FOR SALE.

## Torpedo.

- TORPEDO**, 2½ h.p., single-cyl., nearly new: £25, or near offer.—Digby Bros., Great Square, Braintree. [1948]
- 3½ h.p. Torpedo**, Multi gear; too heavy; sell cheap, or exchange for lightweight.—101, Clonmell Rd., Philip Laue, Tottenham. [1001]
- 3½ h.p. Torpedo**, lamps, horn, new belt, splendid condition; £25, or nearest offer.—T. Mahone, 15, Longbridge Rd., Barking. [1252]

## Triumph.

- 1915 Junior Triumph**, as new; £37.—Parker and Son, St. Ives, Hunts. [1166]
- 3½ h.p. Triumph**, excellent condition, very fast; £24.—18, Edward St., Brighton. [1013]
- 1913 Triumph**; £28; not rubbish; in good condition.—1, Rectory Lane, Tooting. [1120]
- TRIUMPH Junior**, 1915, Lucas lamp, horn, tools; £30.—Dalgety, Wymette, Eton. [1112]
- TRIUMPH**, 1911, fixed engine, in good order; £22.—Meredith, Castle Mill Rd., Ayr. [X1752]
- TRIUMPH**, 1913½, 3½ h.p., 3-speed, good condition; £38.—Hobbs, Uplands, Stroud, Glos. [X2105]
- 4 h.p. 1914 Triumph**, 3-speed model; £40; guaranteed.—Wachope's, 9, Shoe Lane, London. [X2214]
- 3½ h.p. Triumph Motor Cycle**, in excellent condition; £12.—1, South Norwood Hill, S. Norwood. [1910]
- TRIUMPH Junior**, 1915 model, good condition, accessories; £32.—Rev. W. Hudson, Middlewich. [X2153]
- TRIUMPH**, 1913, F.E., Philipson pulley, 2 Lucas, good condition.—Wray, Heslington, Crowborough. [1048]
- TRIUMPH**, 3½ h.p., free engine, B. and B., magneto wants adjusting; £6/15.—Beardshaw, Auctioneer, Wood Green. [1117]
- TRIUMPH**, clutch model, 1911, just renovated, perfect; £25.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1008]
- TRIUMPH**, 1911, 3½ h.p., tyres, etc., good, fast, reliable; bargain, £19.—Letters, Chennells, 6, The Parade, Watford. [19876]
- TRIUMPH**, late 1910, 3½ h.p., splendid condition, new Kempshall rear, tools, horn; £20.—81, Oakdale Rd., Leytonstone. [1009]
- 3½ h.p. Triumph**, 1910, Mabon clutch, lamp, tools, etc.; £22.—splendid condition; £25, or offers.—Kuott, Burton Salmon, Yorks. [19947]
- TRIUMPH**, baby 2-stroke, 2-speed, Lucas lamp, horn, all tools, equal to new throughout; £35.—Dan Guy, Weymouth. [1074]
- 3½ h.p. Free Engine Triumph**, with Philipson pulley; £22.—Delivered November, 1911.—Parker and Son, St. Ives, Hunts. [1167]
- TRIUMPH**, 1914, 4 h.p., 3-speed, lamp, horn, good tyres, perfect; £38 cash, no offers; approval.—Cranleigh, Gt. Shelford, Cambs. [X2076]
- TRIUMPH** (late 1914), 4 h.p., 3-speed, with accessories, condition as new, many spares; £50.—Bennett, College Farm, Aynhoe. [1102]
- 1912 3½ h.p. 3-speed Triumph**, in perfect order; £32/10; guaranteed; easy payment arranged.—Jones, Garage, Muswell Hill, N. [1211]
- LATE 1913 Triumph**, 3-speed, clutch, Chater-Lea sidcar, perfect condition; £36.—Daniel, Sydney Arms, Holmshaw Rd., Sydenham. [1070]
- TRIUMPH**, 1913, 3½ h.p., clutch, starts walking pace, perfect order, and wicker sidcar; £40; Lucas lamp extra.—Liddell, c/o G.P.O., Harrow. [19952]
- TRIUMPH**, 1911, 3½ h.p., clutch model, all accessories; £25.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2283]
- TRIUMPH**, 1913, 3½ h.p., clutch model, all accessories; £34.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2286]
- 3½ h.p. Triumph**, 1911, free engine, in good condition, 2 Jones speedometer, good tyres, lamps, horn, etc.; £22.—Apply, Box 75, c/o The Motor Cycle. [X2031]
- TRIUMPH**, 1912, 3½ h.p., clutch model, all accessories; £33.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2285]
- 1911 Free Engine Triumph**, perfect running order, lamps, tools, new Dunlop tyres, belt, etc.; £20.—62, Hatherley Rd., Sidcup. After 7 o'clock. [19916]
- TRIUMPH**, 1912, 3½ h.p., clutch model, all accessories; £30.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2284]
- 1913 3½ h.p. 3-speed Triumph**, with Canoelet coach-built sidcar; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [10734]
- TRIUMPH**, 1909 (Sept.), standard, excellent order, overhauled and re-bushed, new back tyre; £17/10.—37, Canterbury Rd., Dalston, London, N. [1138]
- TRIUMPH**, 1914, 4 h.p., 3 speeds, cane sidcar, all accessories, speedometer, re-bushed, good condition; £45.—Lammermuir, West Heath Av., Coldest Green. [1027]
- TRIUMPH** (late 1914), 4 h.p., 3-speed, with Millford Corvette sidcar, complete, accessories, excellent condition; £58.—F. Tyrrell, Manor Farm, Cumnor, near Oxford. [X2125]

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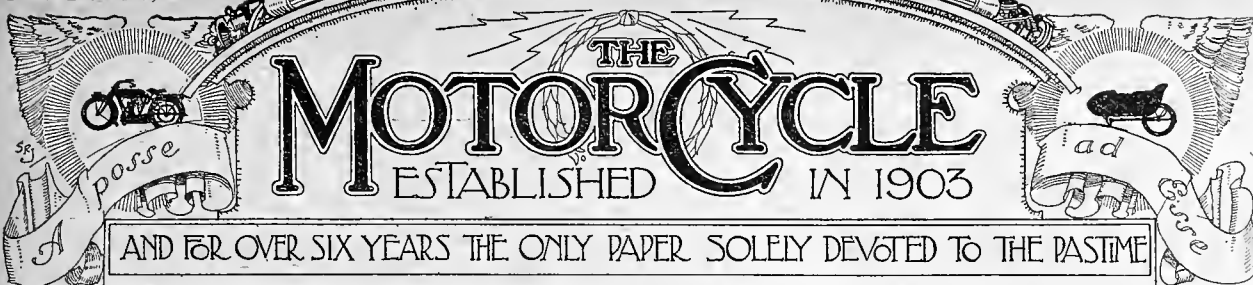
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- TRIUMPH**, 1912, adjustable tappets, enamel and plating excellent, new Dunlop belt, tyres good, do 55 m.p.h., accessories; £25/10.—48, Derwentwater Rd., Acton. [1136]
- TRIUMPH**, 1913, 3½ h.p., N.S.U. 3-speed, excellent condition, coachbuilt sidcar, good tyres, head lamps, and accessories; £30; trial.—1, Penn Rd., Garage, Holloway. [1051]
- TRIUMPH**, solo, 3½ h.p., Philipson pulley and accessories, all in beautiful condition; £28/10.—Leighton's, opposite Wood Green Station. 'Phone: 471 Palmers Green. [1228]
- TRIUMPH**, 1914, 4 h.p., 3-speed, P. and H. head lamp, Serpentine horn, Lucas back lamp; £46.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2288]
- T.T. Triumph**, 1912, specially tuned, Best and Lloyd drip feed, Kempshalls, very fast; £23, or with Lucas 3½ lamp set £24/10; seen after 6.—Hyde Villa, The Hyde, Hendon, N.W. [19966]
- 3½ h.p. Triumph**, free engine, tyres in good condition, 32 new Michelin cover and tube on front, large Powell and Hammer lamp, Klaxon horn; price £25.—L738, c/o The Motor Cycle. [1006]
- 1914 T.T. Triumph**, 3-speed gear, lamp, horn, speedometer, ridden 2,000 miles, original tyres, engine guaranteed, perfect condition; £45.—Robinson's Garage, Green St., Cambridge. [10612]
- TRIUMPH**, 1915, 4 h.p., countershaft, Stewart speedometer, Rinsmore lamp and generator, Lucas horn, used solo only, fine condition; £65.—Ross, 38, York Mansions, Battersea Park, S.W. [1033]
- TRIUMPH**, 1911, fitted with Zenith-Gradua gear, speedometer, Klaxon horn, head and tail lamps, tyres, etc., nearly new, reliable, and in perfect running order; £25.—577, Garratt Lane, Earlsfield. [1028]
- TRIUMPH**, 1910, N.S.U. 2-speed, cane sidcar, new tyres, 3 electric lamps, many spares, exceptional condition throughout; trial by appointment; £35, or near offer.—Gooden, Norwood Lodge, Grays, Essex. [19870]
- TRIUMPH**, 1914, 4 h.p., 3-speed, Cowey speedometer, Lucas head lamp, rear lamp, horn, and Gloria coachbuilt sidcar; £60.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X2287]
- 1914 3-speed Triumph and Gloria sidcar**, Lucas large head lamp, rear, and horn, Jones trip speedometer, spare tubes, belt, etc. (over £90 worth), all in perfect order; £50, bargain.—Barnett, 63, Bath Rd., Cheltenham. [19881]
- TRIUMPH**, 1914½, free engine, Sturmer 3-speed gear, 3 new lamps, speedometer, complete, accessories, Coventry built sidcar (cost 17 gns.), appearance as new; any examination; what offer?—Ronald, 7a, Cripplewood, Broadway. [19925]
- TRIUMPH**, 1911, 3½ h.p., Bowden countershaft 2-speed gear, chain-cum-belt, free engine, kick starter, with 1915 improvements, in excellent condition, and Watsonian wicker sidcar; £35, a real bargain.—G. Holiday, Bicester. [X2154]
- 1914 4 h.p. Triumph**, 3-speed, Lucas electric head light, Watford speedometer, horn, inspection light, tyres practically as new, 3 toolbags, etc.; 46 gns.—Julian, Broad St., Reading. Biggest motor cycle dealer in the South. 'Phone: 1024. [X1539]
- 1914 Triumph**, 4 h.p., 3 speeds and clutch, Cowey speedometer, 3 Lucas lamps and horn, unused belt, complete with Gloria coachbuilt sidcar, adjustable wind screen, in excellent condition; £56, bargain.—Clayton, Lakeside, Beverley Crescent, Bedford. [19999]
- TRIUMPH**, 3-speed, 1913, show model, perfect condition, unspratched, with lamp, generator, speedometer, watch and mirror, full tool kit, including spare valve, £40; also sidcar, torpedo, coachbuilt, for same, £8; any trial by appointment.—Widmore, Sevenoaks. [19949]
- 1912 Triumph Motor Cycle**, single-speed, free engine, clutch, heavy Dunlop tyres (only 2 months' wear), Klaxon horn (21/-), lamp, generator, spares, tools, etc., complete, whole machine shown throughout and in perfect running order; £22 cash.—Box 5, c/o The Motor Cycle. [X1002]
- TRIUMPHS**, 1914, 3-speed Swan combination, Lucas accessories, 60 gns.; 1913 solo mount, Lucas accessories, £41/10; 1911, all accessories, £20; special deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1172]
- Trump.**  
**1913 Trump-Jap**, 3½ h.p., 2-speed, a good machine, guaranteed; £28/10; easy payments arranged.—Jones, Garage, Muswell Hill, N. [1210]
- Tyler.**  
**TYLER**, 2-strokes.—All models from £29 to £42; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [19239]



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### All Work and No Play.

**T**HE climax to the agitations of the busy bodies who have been at work of late urging the suppression of motoring was the issue of a protest last week by the National Organising Committee for War Savings, appealing to motorists to cease the use of motor cars and motor cycles for pleasure. It is actually cited as a reason for abstention that the poorer classes cannot be urged to save so long as they see well-to-do people enjoying "an expensive luxury."

We wonder if the National Organising Committee have taken the trouble to find out what amount of pleasure motoring is indulged in at present? So far as motor cycling is concerned, if it exist at all, it is only to a very small extent at week-ends, and then mainly by busy munition workers. We discussed the subject a month ago on this page, and we argued that a motor cyclist had a perfect right to decide whether he should spend a couple of shillings on petrol (sufficient for nearly 100 miles) to bring him health and vigour after a hard week's work, or whether he should relinquish the use of his motor cycle and spend more in visiting a stuffy theatre or picture house. This is the extent of the "thoughtless extravagance." But who is to decide what is pleasure motoring? And why should motoring be selected when the hundred and one other amusements—many less desirable—are allowed to continue as of yore? A run on a motor cycle is health-giving, invigorating, and a necessary stimulant to jaded workers. If motor cycles were not largely used by professional and business men, and if they were to be seen on the road in the hands of obvious pleasure-seekers in any numbers during the week, we should not take up this attitude. But when it is remembered that every man at home to-day of military age is engaged in an occupation in the nation's interest, or, if not, will in the near future be serving in H.M. Forces, the recommendation, to say the least, is untimely, for every sensible man to-day practises economy.

Long hours are the rule nowadays, and excess work necessitates an occasional week-end change. We cannot see how the National

Organising Committee can consistently cite motorists as an evil example to the so-called poorer classes when Cabinet Ministers and M.P.'s continue to vote themselves their full salaries, and retired Ministers receive their full pensions, and not only so, but practically announce their decision to continue to take them. Besides, the recommendation is weak. If, as would appear from the appeal, a leading object is to stop imports of motor cars and motor cycles, then why not do so, instead of continuing to talk about it? It is no fault of anybody's but the Government's that millions of pounds worth of motor cars and motor cycles have come into this country during the last eighteen months. The recommendation to cease pleasure motoring—if it existed to any undue extent—would only be heeded by the conscientious, which is very unfair. Motorists are already taxed heavily enough. But what if motoring were to cease altogether? Has the National Organising Committee taken into consideration the hundreds of thousands of pounds received annually in registration fees, local taxation licences, and driving licences for the use of vehicles, and the thousands of pounds in duty on petrol? How is it proposed to make up the deficit? It is typical of Government announcements to beat about the bush instead of giving a real lead, and we regard the recommendation as feeble in the extreme, citing as it does the number of ships and men employed in carrying oil and rubber, the men on the docks, railwaymen, and men employed in handling the cargoes, etc., when, as we have said, the fault is no one else's than the Government's. It is within their power to have adopted the *via media* and months ago prohibited imports of all the luxuries and the so-called luxuries if the need were pressing. As regards motor cycles, their owners almost invariably being men of limited leisure, we question the feasibility of further reducing the trivial amount which they expend on their hobby in preference to theatre, club, golf, or whatnot. "All work and no play makes Jack a dull boy." A reasonable amount of purely recreational motor cycling should not be discouraged till every other form of less healthy recreation has been utterly suppressed.



# MILITARY NOTES.

## A DESPATCH RIDER'S VARIED EXPERIENCES.

### TWELVE MONTHS' DESPATCH RIDING. FROM FLANDERS TO SALONIKA VIA EGYPT.

SOME of the experiences and wanderings in different parts of Europe by a section of despatch riders attached to a certain signal company are recounted in a letter we have received from Cpl. C. Clayton-Parrott, himself a member of the section referred to. Parrott has recently been awarded the D.C.M., upon which he is to be congratulated. The signal company to which our correspondent is attached went on active service in January, 1915, since when excitement and hard work have been experienced in different parts of Europe and Africa.

"We were" (writes Parrott) "for some five months in the Ypres district, and it was here during the second battle for that ill-fated city that we D.R.'s came in for our full share of shell fire and gas, etc. We had four of our number wounded, and five or six put out of action from accidents or illness due to motor cycling. Cpl. Ball was one of those wounded; he has since received the Russian Cross (Third Class), and no man ever deserved an award more than he did.

"The photograph shows our whole company, with the exception of our sergeant and artificer, who do not often ride, and Cpls. C. Walker and Harry Drury.

"Our next big move took us to a much quieter part of the line on the borders of France and Belgium. From there we were packed off in a hurry to back up the attack on Loos in September, and whilst there saw enough mud to last us a lifetime. Our brigade H.Q.'s were very advanced and reached only by walking up narrow and muddy communication trenches. We used to look pretty sights on our return from a brigade run covered with mud.

"From there we were destined for a long distance move, as after three or four weeks (including two of the best spent

in Marseilles) we found ourselves in Egypt, enjoying sun baths and dips in the sea—very nice, too, for mid-November, but it was too good to last long—although from a motor cycling point of view we had a fairly rough time, much walking having to be done over the loose sand.

"We again embarked on ships, and eventually landed at Salonika, where we are at the present, camped some three or four miles outside that impossible town. I say impossible, as the roads or streets are too awful for words. We used to grumble at the *paré* in Belgium, but Salonika beats all records in this respect. The setts or granite slabs are about two feet square, and may have been level once, but now seem to be on a two or three inches different level, and in many cases as much as six inches. The tram-lines, too, stand up off the road like railway lines.

"Our camp is at present in the hills and only reached by mule tracks, so that except for runs to the town our bicycles are not much use, so we have been issued horses as well. It is not often Douglasses jib; we have put them to the severest tests, and they have always come out trumps; but mountain passes strewn with boulders and pieces of rock are a bit too much for the faithful mounts. I should also like to say a good word for Dunlop tyres. One man has only had one puncture, and both tyres are good for a few more months. He joined us eight months ago.

"I should like to mention that Cpls. Price, Westall, Curry, Hinchcliffe, and Thompson, after being attached to our company for many months, being regulars for the duration of the war, were compelled to leave us, so remained at Alexandria—some of them got sent to the Dardanelles. Our C.O., Major Saunders, has been twice mentioned in despatches and awarded the D.S.O. and Lt. C. Woodburn Kirby the Military Cross. Both officers are keen motor cyclists in peace times."



Belgian despatch riders, Cpls. Maurice Hélas and Michaux, who ride James machines. Both men have had the same mounts (a single and a twin) since the early days of the war, and speak very highly of the manner they have stood up under active service conditions.

### MOTOR FLEET OF THE QUAKERS IN FRANCE.

THE good work of the Quakers behind the firing line in France is not known as it should be. It consists mainly in rebuilding farm houses and cottages of the poorer classes who suffered so severely in the advance of the Germans through north-east France in the early days of the war. Thousands of refugees have been refitted with clothing, seeds for the poor farmers have been supplied, and help given in the ploughing of the land where the husband is away on active service.

An important part of the equipment of the Society of Friends in this work is a fleet of motor vehicles totalling thirty-two. Of this total there are five motor cycles, all Douglasses. One of our readers, Frank P. Woolmer, has had charge of the repairs of this fleet, and as the cars are of many various makes it has been no light undertaking. However, all have been overhauled during the winter months, and now are on the road doing good and important service in a variety of ways.

### A PIONEER ARMY MOTOR CYCLIST.

WE recently had a visit from Capt. A. H. Trapmann, who was one of the most energetic of pioneer army motor cyclists, being one of the earliest officers of a territorial regiment to impress upon the War Office the future value of the motor cycle in warfare. He was some time military correspondent to *The Motor Cycle*. Since the present war Capt. Trapmann has seen no active service, but previous to that time he saw much fighting in the 1913 Balkan campaign with the Greek army. He is now shortly sailing for the East, and we wish him the very best of luck.



SOME DESPATCH RIDERS WITH THE SALONIKA FORCES.

From left to right: Cpls. C. Clayton-Parrott, D.C.M., L. R. Evershed, P. W. Austen, L. H. Elliott, and F. H. Bensted. All are mounted on Douglasses



### Dry Roads.

East winds have their drawbacks, but their first withering blasts in spring contain a secret thrill for the present scribe. After months of perilous slithering (ugh!) on a wheezy, crawly little baby two-stroke, to get out the big T.T., tuned to the nick, during winter slime, to take it out knowing that the surfaces are safe and hard, to open the throttle, and eat up ten or twenty miles of road, is well worth the subsequent agony of recovering one's circulation by a huge fire. And so say all of us!

### A Change of Kit.

Quite a lot of my riding is of the three stops a mile order, and at some of my stoppages convention demands that I should not enter the house or office with my nether extremities shapelessly swathed in a pair of overall leggings, the lower eighteen inches of which resemble a half-prepared asparagus bed in everything but the presence of the proverbial semi-decomposed donkey. When the days are not cold, I have modified the get-up by wearing riding breeches and well-polished gaiters, the sheen of which might be restored by a wipe over with a large mutton cloth stored for that purpose in my head lamp. But one day this winter my business delayed me long past nightfall, so the mutton cloth had to come out of my lamp, and, as I am an absent-minded beggar, it went into a side pocket. An hour later I tramped into Mrs. Ixion's boudoir, eying her nervously, blowing my nose vigorously, as a cover behind which I might think out a new lie to account for my tardy return. (No, I am *not* a favourite of the new barmaid at the King's Head!) Suddenly I caught her expression; "bristling" was the best word for it. She advanced, majestic, stupendous! Seized the tongs. Rescued from her boudoir floor my mutton cloth, which had become dislodged, as I stuffed my greasy gloves away. "'Ixion,' what is this?" It is ashes now. Next day I bought some spring-sided patent leather gaiters, which I can whip off when I want to do the dandy at a call; and to keep—well, the upper halves of my nether extremities—cosy in an English spring, I wear beneath the riding breeches [Remember our lady readers, Ed.]—well, they're made of Jaeger-Arctic grade, gentlemen! The sum total is neater than overalls, quite as warm, easier to put on, easier to take off, less liable to rip; and in the event of a heavy storm, there are my trusty Beacon oilies strapped to the carrier.

### Maladjusted Overhead Inlets.

A novice complains that I am growing too technical, and that I never write in words of one syllable nowadays. Remembering my own salad days, let me now distil simple wisdom anent overhead inlets,

especially in view of a problem on the subject recently set us by a reader. If the clearance at the rocker of the valve is allowed to grow excessive, the normal symptom is a considerable loss of power. On the one hand, the inlet valve cannot open as much as it was designed to do, so that a full charge cannot be inhaled; on the other hand, it opens later than it should, which further weakens a willing engine. The correct adjustment is that there should just be clearance, and no more, when the engine is hot.

### A Good Two-stroke Carburetter.

Carburetter design has a marked effect on the running of small two-strokes; one always knew, of course, that they were sensitive to carburetter adjustment. I had made every conceivable experiment with a certain baby, and its running was still unsatisfactory, especially in respect of starting, acceleration, slow running, and petrol consumption—four rather vital points. As a last resource I fitted a B. and B. baby carburetter, and was astonished to find that its running was transformed, though the test was made with the setting selected as standard by the makers. The engine now starts in a yard or so, even when cold, and usually fires before the back wheel is out of the shed. The acceleration is terrific. The slow running is perfect, except that there is still a little misfiring in sudden slowings down; and the fuel economy has improved nearly 20%. I must not plunge into unjustifiable generalisations, and infer that similar improvements would be sure to follow with any other engine; but the baby B. and B. certainly gives far better results with my present engine than either of the carburetters previously fitted to it.

### Baby Two-strokes up Freak Hills.

While I am on two-strokes, I wonder what is the worst hill climbed by readers on standard baby two-strokes? I am sure the Editor will be glad to print a few brief letters, giving particulars of engine, c.c., gears, name and locality of hill, etc. I ask the question because I am beginning to doubt whether the average baby is geared quite low enough for really atrocious hills. It is up to ordinary main road work, *sans doute*, even in the hillier counties. But—pardon the terrible confession—I actually had to push up a frightfully steep bylane the other day. My engine had always had loads of power in reserve on the Midland hills, and I snicked in low gear quite happily when the aforementioned steep hove in sight, only to jump off and run ineffectually about halfway up. If this is a normal occurrence with babies on really bad hills, some of our rural residents must be privately pressing the factories for lower emergency gears. The baby is indubitably the handiest machine in the world for winter lane work; and it will be in good demand for such jobs

## Occasional Comments.—

when the war is over, provided it can manage the hills satisfactorily. If a lower emergency ratio is required, the factories will need some warning. It would have to be an option, as existing gears are low enough for at least 60% of the users; and there is not always clearance in the lilliputian gear boxes for a low gear-driven pinion of larger diameter, whilst the introduction of a three-speed box will send up both price and weight.

**A New Braking Idea ?**

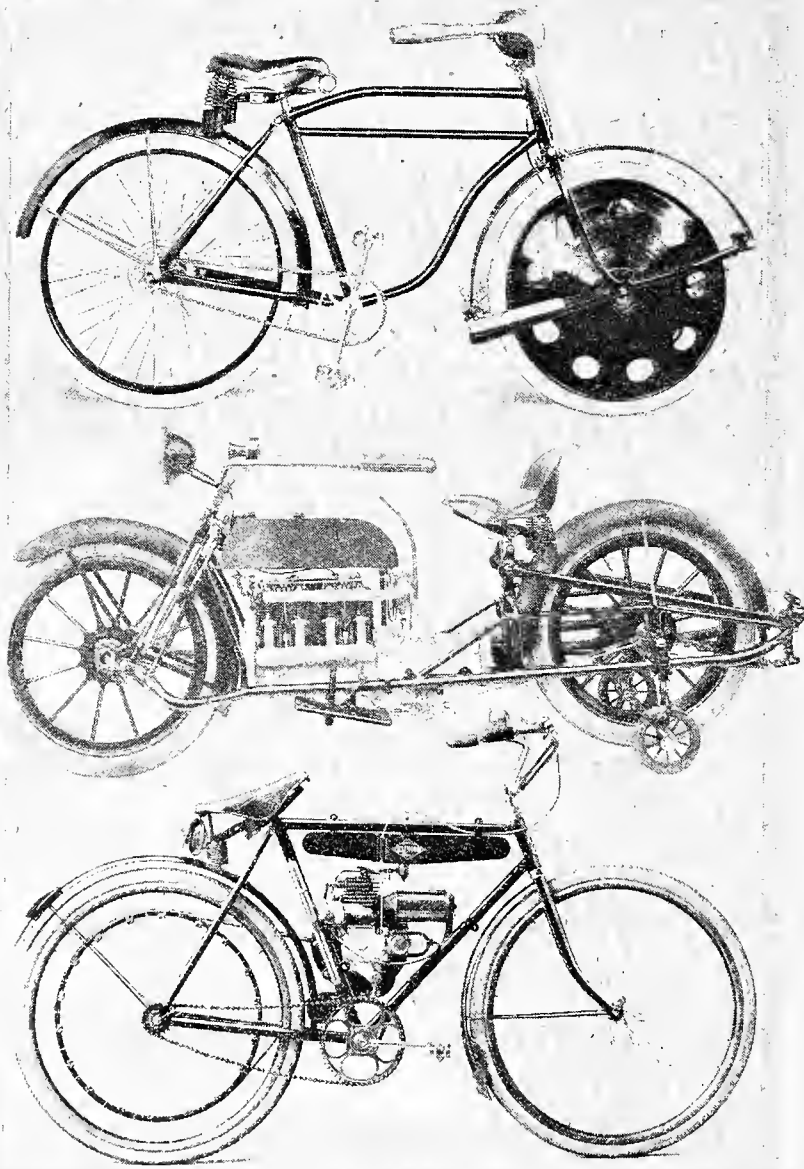
I recently asked a manufacturer whether he considered his standard brakes were powerful enough for all emergencies. He answered with a frank negative. Like most practised hands, he is a profound disbeliever in front wheel brakes, and only fits one because of the stupid law on the subject, taking care to prevent its being really efficient, and never using it at all in his own riding. At the same time he considers it inadvisable to fit a tremendously powerful rear wheel brake, though it is a simple matter to do so. The rider who has not mastered the niceties of driving—and many riders never master them—is prone to stamp with full weight on the brake pedal at the least suggestion of approaching danger; and such procedure will cause at least as many accidents as it will avoid. Consequently he designs his rear brake so that it shall possess good stopping power, but just fails to lock the wheel suddenly under abrupt application. All this is sane and well-reasoned

practice as far as it goes, but it still leaves the question, "What is the rider to do in urgent emergencies, when abrupt and almost instantaneous pull-ups are the only alternative to disaster?" My mentor solves this by fitting a gear box with an absolutely foolproof change. Provided the clutch is withdrawn, you can change from any gear to any gear on this machine, without the least attention to engine speed, pauses, or other normal dodges for silent gear changing; and the change will never be noisy. All his customers are advised to rely on gear changing as their normal method of braking; and when an emergency arises,

an instantaneous stoppage can be engineered by slamming in a low gear and using the rear brake at discretion simultaneously. As some readers are aware, this dodge has been widely employed in the T.T., where it also renders acceleration an easy matter.

**Riding Through Sand,**

Will some friendly Yank or other overseas rider kindly present me with a few hints on riding through deep sea-blown sand? Is it possible, and, if so, what is the trick? Approaching some strange golf links the other day, I was much nettled by my opponent's contemptuous advice to leave my bicycle and walk the last half-mile. On enquiring into the nature of the obstacles, I was countered with the one ominous word "sand." Much goodly coin of the realm was finally staked on the issue, and I started. I made several heroic attempts, but one sandy gully floored me every time.

**THREE UNUSUAL AMERICAN DESIGNS.**

(Top) The Dayton lightweight, in which the motor is located in the front wheel. The footrests are attached to the end of the front forks, and so move with the wheel.

(Middle) Latest model of the Militaire—the nearest approach to a car.

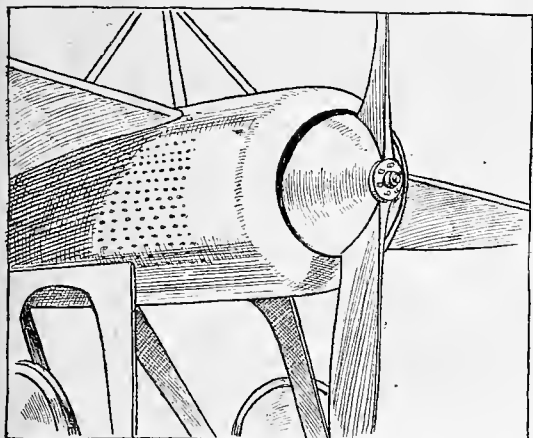
(Bottom) The Cyclomotor, a lightweight attachment.

# THE AERO ENGINE.

## HOW WAR-TIME DEVELOPMENTS MAY HELP MOTOR CYCLE DESIGN.

(Continued from page 603, December 16th, 1915.)

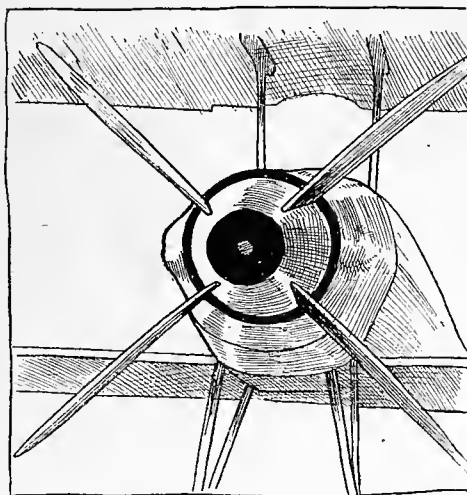
**T**HE previous article on this subject concluded with some general remarks about the 50 h.p. Gnome engine, which, it was explained, was the first practical engine to be produced in any quantity, and to which one of the greatest advances in aeroplane construction was undoubtedly due. It may be of interest to trace onward the subsequent types of Gnome engines. The seven cylinder 50 h.p. Gnome had a bore of 4.35in. and a stroke of 4.73in., and its weight in pounds per b.h.p. was approximately 3.4. There was also a seven-cylinder 60 h.p. engine, the bore and stroke of which were 4.73, the weight per b.h.p. being 4.2 lb. The seven-cylinder 80 h.p. engine had a bore of 4.88in. and a stroke of 5.52in., the weight per b.h.p. being 2.6 lb. Later there was a 100 h.p. nine-cylinder engine with a bore of 4.88in. and a stroke of 5.9in. weighing nearly 3 lb. per b.h.p. The foregoing engine also were doubled, that is to say, there would be two rows of seven cylinders and two rows of nine cylinders, so that there was a fourteen-cylinder 100 h.p. engine, a fourteen-cylinder 120 h.p., a fourteen-cylinder 160 h.p., and an eighteen-cylinder 200 h.p. engine. Very few new machines are built nowadays for use with a 50 h.p. Gnome engine, the favourite sizes being the 80 and 100 h.p., although the use of these appears to be limited latterly. The bigger-engines, of course, are also in demand.



The front of the Deperdussin racing Monocoque, showing the way in which the Gnome engine is covered in with a cowl to reduce the head resistance without detriment to the cooling capacity. This machine covered 124 miles in 1h. 9m.

When it is said that the 50 h.p. Gnome is not often built into new machines nowadays, one is perhaps erring a little, because it was on a little machine (nick-named the "Sopwith Runabout") built by the Sopwith Company, equipped with a 50 h.p. Gnome engine, that Mr. Hawker, the well-known pilot, recently

achieved a feat which has been spoken of and secretly aimed at for years past at Brooklands, that is, flying under the Byfleet foot bridge over the track. In the course of a conversation with the A.B.C. Co. the other day I was told that the engine which Hawker then



Front of a Royal Aircraft Factory experimental biplane fitted with a rotating cylinder engine provided with a cowl to reduce head resistance. This machine exceeded 130 miles an hour.

used is very probably the No. 11, one which they sold to Sopwith's years and years ago. The writer rather chuckled at this, because he recollected a jest or fable that used to go round the Brooklands clan in the early days, to the effect that, after a bad smash on the part of someone, whose name he cannot just remember, A. V. Roe bought, very cheaply, a 50 h.p. Gnome engine in a damaged condition. When he came to inspect it he found that one of the cylinders, which, of course, are remarkably thin and very easily damaged, had become bent a trifle oval, so that, the tale runs, "A.V." eventually got the piston out, put it in a vice, and bent it oval to match, and then put it back again. After that I believe it got into the hands of the A.B.C. Company. Furthermore, a 50 h.p. Gnome once put in a Sopwith-Wright biplane blew off one of its cylinders whilst the machine was in the air, and the cylinder went clean through the top plane. However, that is a digression.

### The Air-resistance of Revolving Cylinders.

One of the faults of the Gnome engine, from an aeronautical point of view, is its very considerable head resistance, and also the power required to turn the cylinders round against air resistance. At first the engines were allowed to run exposed completely to the



**The Aero Engine.—**

air, it being thought that this would be necessary to ensure the supply of cooling air. However, it was eventually found that the engine might be enclosed almost entirely, with a comparatively small space left for air to enter at the centre of the cylinders, and to escape at any convenient point, generally beneath the front of the machine. Two illustrations of this cowling are given, one being the method utilised on the original racing Deperdussin Monocoque, which covered 124 miles in 1 hour 9 minutes for the 1913 Gordon-Bennett Cup, the other being the front of an experimental machine produced by the R.A.F., said to be capable of a speed of 130 m.p.h. This point is mentioned to give some idea of the importance of streamlining where speed is concerned. Another important effect of this cowling was to prevent the unburnt castor oil, which used to issue in a fine stream from the exhaust valves of the cylinders, from coating the planes, the tail, and the pilot with a sticky mess.

There is no question that one of the bugbears of the Gnome engine was the automatic inlet valve in the piston, as this device was a delicate one, and one that was necessarily put to considerable hard work. The springs required much attention, and it was essential to the sweet running of the engine that the tension of all the springs should be approximately equal. Added to this, of course, the automatic valve was abandoned for most other kinds of petrol engine work years since as inefficient. Nevertheless, there are very many people who hold to this day that part of the initial success of the Gnome engine was due to the fact that the cylinders and pistons are internally cooled by the incoming mixture from the crank case.

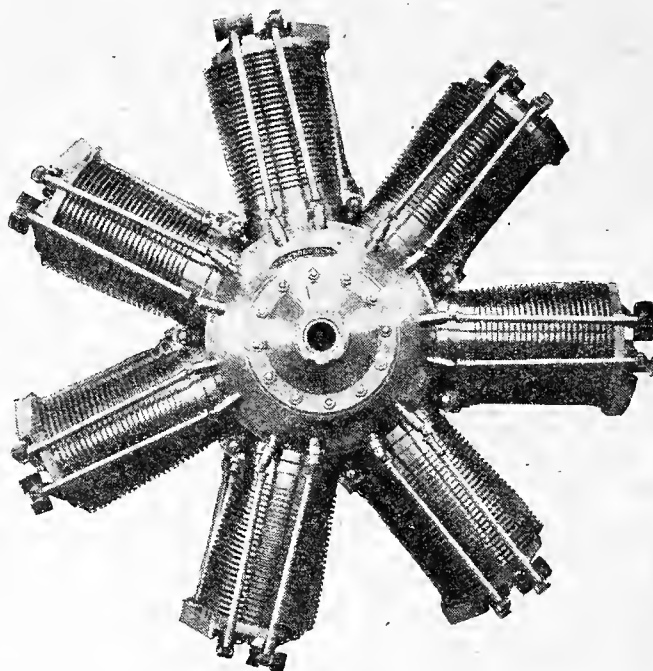
**A Four-stroke Engine with Transfer Ports.**

Be that as it may, however, the Gnome Co. produced some little time before the war an entirely new engine on a somewhat different principle, having only a single valve, and that an exhaust in the cylinder head. This engine is known as the Monosoupape, and a diagram of it is given on the next page. Substantially the arrangement of the engine is the same as that of the original two-valve type, and the mixture is again fed into the crank case, or, rather, one should say that air is drawn in through the hollow shaft and nose piece of the engine, and through the timing end of the crankshaft, where it picks up petrol which is supplied by a small force pump to a jet placed in the forward web of the crankshaft. The mixture thus drawn in is extremely rich; in fact, far too rich to ignite in the ordinary way.

The cylinder is made longer than usual, and has close to the lower end a row of ports which are exposed to the interior of the cylinder by the piston when the latter is at the bottom of its travel. These ports are also in connection with the interior of the crank case. The engine works on the four-stroke principle. Supposing that in the cylinder at which we are looking the piston is commencing its downward firing stroke, the large valve in the head of the cylinder is opened early to allow the burnt charge to escape, in which it is helped by centrifugal force. When the piston reaches the bottom of its stroke the ports in the crank case are uncovered, but the timing is so arranged that at that point the pressures within the crank case and within the cylinder are approximately equal, so there is no tendency for a rich mixture to flow into the cylinder. The piston then completes an upward stroke, forcing out the residual contents of the cylinder through the still open valve. At the downward or suction stroke the valve continues to be held open until about one-third of the stroke, and fresh air enters into the cylinder through the exhaust valve. When the latter closes, further motion of the piston taking place, a depression is created in the cylinder, and when the piston reaches the bottom of its stroke, and the ports are uncovered, a super-rich mixture flows in from the crank case and, mingling with the air, is compressed by the upward stroke of the piston ready for firing. The speed of the engine is regulated by varying the timing and lift of the exhaust valves by a link motion. As the petrol is supplied by a force pump its quantity is regulated by the speed at which the engine is running.

A point about the design is that the vaporisation of the petrol takes place inside the crank case, so that the latter gains the fullest advantage as regards cooling, a point which may perhaps be peculiarly useful so far as the lubricating oil is concerned. The Monosoupape engine weighs slightly less per horse-power than the original type. Its speed of revolution is approximately the same.

Of course, the original success of the Gnome engine produced many copyists, and numberless attempts were made to equal or improve upon its performance without originally any success. Within the last year or so, however, considerable progress seems to have been made with the Le Rhone engine, and also with the Clerget. In design both these engines are somewhat similar to the Gnome, although in details they differ considerably. The Le Rhone is now amalgamated with the Gnome Co. The engine has mechanical exhaust and inlet valves in the cylinder head both



The seven-cylinder Clerget rotating cylinder engine, which has mechanical exhaust and inlet valves, and a separate inlet pipe from the crank case to each cylinder.

**The Aero Engine.—**

valves being operated by a single push and pull rod. The mixture is fed into the crank case, and thence is conveyed to the inlet valve of each cylinder head by a separate pipe. For its power the Le Rhone engine is slightly heavier than the Gnome, but is rather more efficient in petrol and oil consumption.

**Other Ingenious Types.**

There are, of course, numberless other types of rotating cylinder engines; some, indeed, in which the cylinders rotate in one direction whilst the crankshaft rotates in another. Many of these designs are very ingenious, but as none of them up to the present time seems to have proved itself successful, it would be somewhat of a waste of space to deal with them. The writer must confess that he thinks those authors of papers or books on the subject of aeroplane engines waste any amount of space and trouble in dealing with engines which, although ingenious, have never proved themselves practical successes. This space would have far better been devoted to full and correct accounts of the existing successful engines, the way in which to handle them, their faults, and the way in which these faults could be remedied. After the war, when all the experience which has been and is being gained can be collected and classified, there is no doubt that an immense amount of most interesting information will be forthcoming. One cannot draw from the mass of information which is already available as it is for fear of assisting the enemy.

There has been, perhaps, in the foregoing, little of direct interest to the motor cyclist, although some attempt has been made to show the limitations of the rotating cylinder engine. Incidentally it may be mentioned that two of the greatest defects of the Gnome and similar engines are, firstly, that they will not run for a period exceeding about twenty-four hours without it being necessary to take them completely to pieces for cleaning and the renewal of various parts, and secondly, such engines upon a slight derangement are liable to stop altogether when in the

air instead of being able to jog along after a fashion. This means that for war purposes they can be hardly satisfactory, save for stunt speed or climbing machines meant for offence or defence behind the lines.

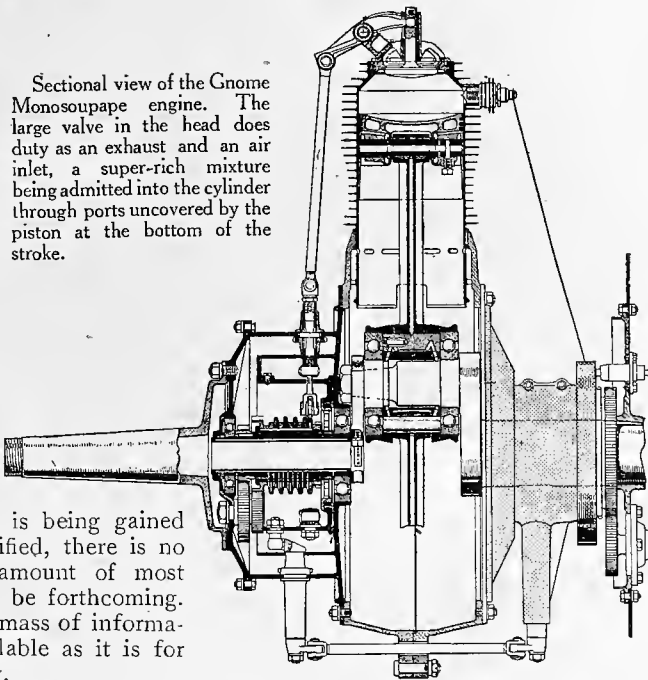
**Air and Oil-cooled.**

Some mention should be made upon the subject of lubricating and of cooling. The oil consumption is very heavy, and the original Gnoms used about one-third of castor oil to the quantity of petrol. This was largely due to the fact that centrifugal force causes the oil to be flung into the cylinder and piston, and, gradually finding its way past the latter, is burnt in the combustion chamber or flung out in a partially burnt state. It has been suggested that the Gnome engine is very largely oil-cooled as well as air-cooled,

and it is extremely probable that there is something in that view, at any rate so far as the cylinders are concerned. The only parts of the Gnome engine which really might be considered to require oil under pressure are the big end and small end bearings of the connecting rods and the cylinders. Owing to the speed of the engine the timing gear should make no special demands, whilst the crankshaft and the master connecting rod bearings are balls which require no lubrication, but merely protection against rust, provided they are up to their load. The Gnome and most other rotating cylinder engines are equipped with steel cylinders, and these on the score of cooling efficiency,

expansion, and lightness. So far as other aeroplane engines are concerned there can be no doubt that the modern tendency is towards the steel cylinder, whether air or water-cooled, and there seems to be little doubt that much of this tendency is due to the pioneer efforts in this country of the Green Engine Co. and the A.B.C. Engine Co., both of which are well-known in the motor cycle industry also, and concerning the products of which there is much of interest to be dealt with in due course.

M.T.



Sectional view of the Gnome Monosoupape engine. The large valve in the head does duty as an exhaust and an air inlet, a super-rich mixture being admitted into the cylinder through ports uncovered by the piston at the bottom of the stroke.

**BRITISH TRADE WITH RUSSIA.**

ONE of the first practical steps to stimulate British trade with Russia and to divert to British concerns the enormous trade heretofore enjoyed with Russia by Germany is the publication of the "Directory of British Manufacturers for the Russian Trade," edited by R. A. Lenski, and printed in the Russian language for circulation in Russia. It is published at 5s., by the Russo-British Trade Exchange, Ltd., 16, Regent Street, W. As regards the motoring

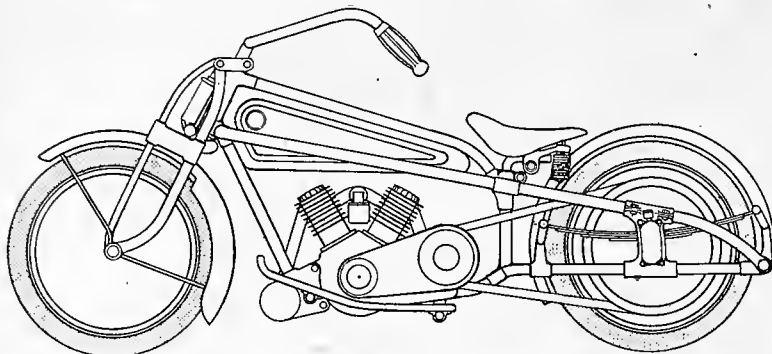
section, we note that motoring firms are not so well represented as they might be, though whether this is due to lack of interest displayed by British motor cycle manufacturers or to lack of initiative on the part of the publishers we are not prepared to say.

The great extent to which British-built motor cycles are being used by the Russian Army should greatly assist manufacturers concerned in obtaining trade in Russia after the war.

# THE SPRING FRAME PROBLEM.

FURTHER DESIGNS IN SUPPORT OF "THE MOTOR CYCLE" CAMPAIGN.

Finality in spring frames is by no means reached at present, and we publish on this and the following page designs which have been submitted by readers. Without wishing to make invidious distinctions we may say that Mr. Addenbrooke's drawing shows much originality, not only in the arrangements for the springing, but also in the triangulation of the frame itself. The American design sent by Mr. L. F. Jones is interesting, as it was seen in use four years ago, but we do not think it brings us any nearer to a solution of the problem.



Suggested spring frame design. See letter on this page from Mr. R. G. Kershaw.

## Semi-elliptic Springs.

Sir,—Having followed with interest the articles and correspondence in connection with spring frame design for motor cycles, I am enclosing herewith a sketch showing an arrangement of spring frame which may appeal to some of your readers.

R. G. KERSHAW.

## Spring Frames with Variable Gear Machines.

Sir,—I have been very interested in the various designs of spring frame shown in *The Motor Cycle*, but have never seen one with which the infinitely variable gear—such as the Gradua—could be used. Has this ever been tried? I enclose a sketch showing one way in which I think it could easily be done.

On the saddle lug are hung quarter-elliptic springs of the usual type, fastened rigidly. Their free ends are anchored to swivelling joints on a U-shaped tube (as in the Douglas and other machines) which, in turn, is free to oscillate about the axle. The usual chain stays at their forward end are anchored to two bell crank side plates which have their fulcrum at the lower end of the saddle pillar. From these the two pulley control rods are taken to the pulley.

To the other end of one bell crank plate is attached an internally threaded sleeve, in which works the threaded gear lever. This lever is kept from rising or falling when it is turned by the steady on the top tube. When the gear lever is turned so as to push the sleeve (and also the

bell crank side plates) downwards the plates rotate, which brings the back wheel forward, the U tube being free to rotate at the point where the springs are attached.

Low gear is obtained by turning the gear lever in the other direction, drawing the arm of the bell crank up, and thus pushing the back wheel further back and also opening the pulley by pulling back the rods. While the gear ratio remains constant the plates remain stationary, all oscillations due to the springing system being taken up by the upper arm, which is in such a position that the belt tension should not be at all affected by the flexing of the springs. Owing to the two sides of the frame being rigidly connected at four points lateral play should be impossible.

The spindle on which the plates are pivoted could have squares formed on the ends, and thus both plates would be rigidly connected; if necessary the plates could be provided with an Autoloc arrangement, which allows the lower side of the cranks to be moved, but renders them absolutely rigid from the upper side. A spring carrier could also be used

NORMAN FORSTER.

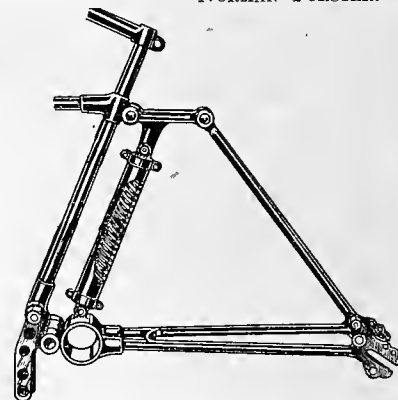
## An American Idea.

Sir,—In view of the prevalent interest in rear springing for motor cycles, you may consider the accompanying illustration worth reproduction. It depicts the spring frame fitted to the Minneapolis machines about four years ago, and its working needs no explanation.

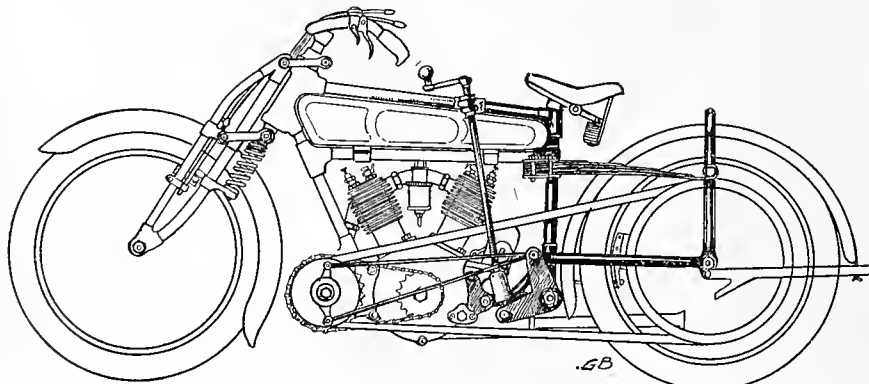
The springing question has always been far more acute in the United States than has been the case here, and the Minneapolis device is but one of the many designs offered to the American public during the last few years.

Incidentally, the Minneapolis was also noteworthy in its day for the fact that its gear box was made integral with the crank case, and it must have been almost the first example of this type of engine construction.

L. FRANCIS JONES.



The Minneapolis spring frame.



A design for a Zenith Gradua machine. See letter from Mr. Norman Forster on this page.

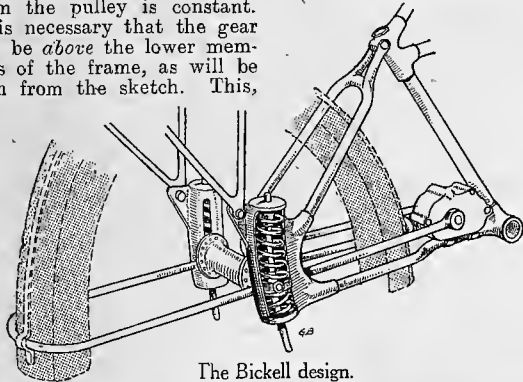
## Double Helical Springs.

Sir,—Knowing the interest you take in the development of the rear spring systems for motor cycles, and the way in which you put each suggestion before your many readers, I am sending to you a description and sketch of a system that I have invented, and for which I hold a provisional patent, trusting that you will find space for it in your most

**Spring Frame Design.**

interesting and valuable journal. The following is the description:

The axle of the rear wheel is fixed in a special framework consisting of a tube running from the gear box round the back of the wheel and returning to the gear box on the other side. This arm is intended to pivot on the shaft of the driving pulley, ball bearings being, of course, used in the moving parts. This arrangement allows the wheel a radial motion around the centre of the driving pulley so that the tension of a belt or chain driving the rear wheel from the pulley is constant. It is necessary that the gear box be *above* the lower members of the frame, as will be seen from the sketch. This,



The Bickell design.

I find, could on most popular makes of cycles be altered with very little trouble.

Two special lugs are fitted where the four rear members of the ordinary frame meet—one on each side. In the back of each lug is a slot through which passes a continuation of the axle. Thus the wheel is able to move up and down in the frame according to the length of the slots. To prevent side thrust and undue strain on the countershaft two rods—one on each side—are attached to the continuation of the axle. These rods are of the same curvature as the arc described by the rear axle as it moves up and down in the frame, and they pass through the tops and bottoms of the special lugs. Then the rear axle is free to move up and down in the lugs, but all other motion is prevented by these rods. Now the springs are placed in position. Two strong coil springs are fixed between the axle and the top of the lugs—one on each side—so that the rods pass through their centres. These springs support the weight of the cycle and absorb road shocks. Below the axle are two shorter springs placed similarly to those above, but not having such great strength. These lower springs absorb the rebound of the main springs in the event of the cycle striking an object when at speed. The lugs, when fitted, would have a casing to cover and protect the springs.

The axle would, of course, need to be of the "knock out" type, of which the A.J.S. is a splendid example. The removal of the wheel would, therefore, be in no way altered on account of the special frame. The frame itself would be little altered; and, a point in favour of my system, whereas the movement upwards of the axle of a bicycle fitted with a laminated or leaf spring system is comparatively small (obviously, it cannot be great, or the tension of the belt or chain would be altered appreciably), with the coil spring system I wish to bring before your notice an upward or shock-absorbing motion of 5in. or even 6in. could be obtained, and this without interfering with the transmission in any way. The mudguards could be attached either to the wheel framework or to the main frame itself.

I have taken a very great interest in the many designs published in your paper week by week, and I trust that you will consider this worthy of a place in your pages, and also worthy of the criticism of your many readers.

STANLEY F. BICKELL.

**A Good Design.**

Sir,—I was very much interested in "Amateur Designer's" article on spring frames in your issue of February 3rd.

He put down all the chief weaknesses very clearly; but I do not altogether like his suggested amendment, as it would necessitate heavy lugs in

which to hold the laminated springs, and also, I should think, he would have difficulty in placing his gear box where the distance between its driving pulley centre and the centre of the back wheel would be constant.

I enclose a plan of my own, in which I use two semi-elliptic springs below and two quarter-elliptic springs above the back wheel. The two top springs are merely to steady the wheel and to adjust the machine for any weight, as suggested.

The radius rods from the back axle to the gear box centre could be put on lugs brazed to the frame instead of as shown if more convenient. You will also notice that the frame is "theoretically correct," i.e., straight top tubes, and the front down tube, saddle tube, and bottom back stays meeting in a point.

The frame has a double top tube, each tube starting from the head and then being brazed into the saddle pillar lug, whence two more tubes, only slightly out of the line of the first two, form the back stays, which terminate behind the back wheel.

Otherwise, I think the plan is self-explanatory, except for the engine, which has an outside flywheel, and cylinders fixed down after the manner of the excellent A.J.S. machines.

H. S. W. ADDENBROOKE.

**A Suggestion from Nyasaland.**

Sir,—I have been extremely interested in your advocacy of the spring frame for motor cycles. The activity displayed in this direction by designers is remarkable, and the number of designs at the disposal of motor cyclists will soon be legion.

Motor cycle manufacturers must be at their wits' end to select the most suitable design to meet their requirements, and even when their selection has been made it is not unreasonable to suppose that the design may become obsolete before it is offered for sale to the public.

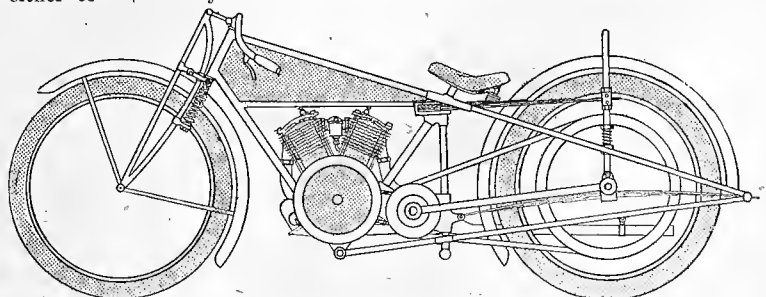
I think, as a matter of economy, it might be wise for the manufacturers of motor cycles to leave the matter of spring frames to cycle frame manufacturers. By doing so they will enable the public to choose the type of spring frame most suitable to the requirements of the rider, as I am certain one type of such frame will not suit all riders. To have a selection of frames will add to the popularity of most makes of motor engines, and especially those that are popular already.

Again, in all probability, it may be found that one type of frame is most suitable for summer riding while another type is better adapted for winter riding, and the enthusiastic rider will thus be enabled to make his mount an all-weather machine. It would also enable Colonial motor cyclists to select the frame most suitable for their requirements. It might also tend to standardise the frame-fixing parts of engines, and also, let us hope, to standardise the threads of bolts and nuts.

There is most certainly no necessity for having more than one type of frame fixture for round crank cases, and another for, say, square-headed crank cases. This would enable the frame manufacturers to cater for the trade with some hope of large outputs of their wares. It would also enable the purchaser to exchange engines or frames, as well as to purchase some new type of frame that may take his fancy. The combinations of engines and frames would be extremely interesting, and add an attraction to the buying public.

J. M. INGLIS.

Nyasaland.



Commendable design of rear springing evolved by H. S. W. Addenbrooke



## Wounded Soldiers in Sidecars.

An Enjoyable Outing into Surrey arranged by the Harley-Davidson Motor Co.



The gallant men lined up after the lunch and entertainment at Burford Bridge.

ON Saturday last the Harley-Davidson Motor Company organised a most successful day's amusement for wounded soldiers in sidecar combinations belonging to the firm and private customers. The event was extremely well carried out, and, to use a familiar expression, went with a swing from start to finish.

Twenty wounded came from St. Thomas's, fifteen from the City of London Red Cross Hospital (which is a sort of branch of St. Thomas's), and ten from St. George's Hospital. There were about thirty sidecar combinations in all, and three or four cars; of these, one belonged to Mr. Duncan Watson, while another was driven by Mr. G. Petyt. The first batch got away punctually to time, and were soon bowling along over Westminster Bridge and then westwards on the Chelsea Embankment. Our passenger was a good-looking boy—he looked no more than a youngster—who had had six years' soldiering and had been transferred from India to France, where he had been wounded at the battle of Loos. This was his first excursion from London, and his first ride in a sidecar, and he much enjoyed it.

### Protection from the Rain.

The morning was fine at first, but it became very cloudy at noon, and shortly after starting there was a brisk shower which lasted half an hour. Fortunately one of the instructions on the programme urged drivers to bring waterproofs or coats for their passengers, and at the first sign of a downpour we helped our man into an oilskin. A little further on we met a large batch of about twenty who were busy donning coats. All along the Embankment the long line of sidecars wended its way, and a very interesting

procession it made, motor cyclists in their weird and wonderful garments and the passengers some in ordinary military caps, some in Glengarrys, here and there an Anzac head-dress, and in one instance a sailor's cap.

The police were much impressed, and smilingly held up the traffic as the serpentine of sidecars wound its way past them. At Putney it was raining fast, but as we all sped up Putney Hill in a bunch and reached the Common the worst was over. The ascent of the hill which rises out of Kingston Vale from the Robin Hood was worth watching. We were all in a bunch (which did not matter, as there was no dust), and all seemed to be climbing at the same speed; it was quite the best

"one-design" event we have ever witnessed.

### Getting away from the Tramlines.

We left the tramlines at the top of Kingston Hill, thereby following the programme instructions to the letter. "Don't forget to avoid tramlines," said that worthy publication, and then gave a route which followed them, so we took a not too well-known short cut, promptly lost the others, and saw them not again till we reached the rise out of Chessington, and in two minutes the vanguard arrived. Here the photographers awaited us, grumbling that they had had all their work cut out to get their pictures. They then took two or three hurried snaps, and set forth



A halt on the road for the benefit of the photographer.

**Wounded Soldiers in Sidecars.—**

to execute a clever strategic movement. It was cold indeed in that open piece of country, but nobody cared. Nothing happened till we got to a point half-way between Leatherhead and Burford Bridge, where the photographers brought up their artillery across the road and prevented the column from debouching by their curtain of fire. Thereafter there was nothing to report, except that we all reached the Burford Bridge Hotel after a splendid run some few minutes ahead of schedule.

Everybody was ready for lunch long before the appointed hour, but punctuality was the order of the day, and to the minute the chairman took his seat at the top table in a separate entertainment room in the hotel grounds. It was a good lunch smartly served, and the men fell to with a will. Altogether there were 104 seated at the tables. After lunch came the concert, and a very good one it was. The programme was admirably selected, and each item was appreciated to the full. There was nothing mawkish or sentimental, several good songs, which, when finished, made one want more, a banjo piece at 4,000 r.p.m. into which both performer and

accompanist put an amazing amount of energy, and brought down the house, and two or three most amusing turns. A message was received from the chairman of the A.C.U. wishing much success to the event.

**The Speeches.**

Then followed the speeches, which were short and to the point. Mr. Duncan Watson, in a brief and soul-stirring little speech, told of the way in which the gallant soldiers' work for their country was appreciated. All could not go and fight, but if those who stayed behind could give these splendid fellows one hour's happiness and enjoyment, they felt that in those moments they were indeed serving their King and country. He went on to mention the name of Mr. G. Q. Roberts, secretary of St. Thomas Hospital, who, through being himself a motor cyclist, had talked over the military commandant, had overcome his prejudice, and made the outing possible.

Mr. E. M. P. Boileau, *The Motor Cycle*, in replying on behalf of the guests and the press, mentioned the difficulties he had had last year in organising a similar event, when the originator of the idea, a patriotically-disposed lady, had approached a dozen military hospitals, the authorities of every one of which had refused to allow the patients to go out in sidecars, and how eventually it was found only possible to take out wounded Belgians. Mr. Roberts had done good work in overcoming that prejudice, and the Harley-David-

son Motor Co. had set a splendid example to other motor cycle manufacturers in inaugurating such a good work.

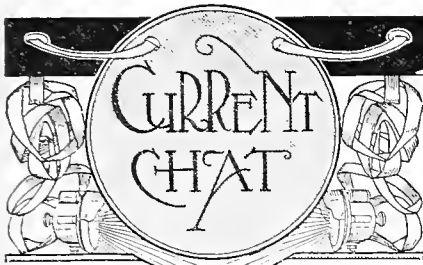
Then arose a gallant Anzac, Sgt. Robb, a soldier bluff, who knew how to address his men and spoke full of gratitude on behalf of the wounded. He had been initiated on the way down into the joys of motor cycling, and wanted to take a sidecar machine back to Australia with him; he had got as far as asking the price. (Cheers.) When he was in Gallipoli he wondered, while things were at their worst, if life was worth living, and why there was such an awful thing as war, but when he came to London and enjoyed the wonderful hospitality there shown to him he knew it was indeed worth while, and for that would go through it all again. On behalf of his fellow men he expressed his great gratitude, and as a small token of appreciation he handed a splendid bouquet of flowers to Mrs. Duncan Watson.

Mr. G. Q. Roberts, who arrived after lunch and was accompanied by his son, Sec.-Lt. A. Q. Roberts, R.E., formerly a keen competition rider, then made a brief and amusing speech, in which he thanked the Harley-Davidson Motor Co. on behalf of St. Thomas's Hospital, and mentioned how much he admired the excellent organisation of the event. What he had had to contend with was not prejudice but ignorance—a fault from which he suffered when he walked and other people used motor cycles.

The journey home was made in fine weather though cold, and all arrived in good time at their destination

**SCENES ON THE HARLEY-DAVIDSON OUTING FOR WOUNDED SOLDIERS.**

Thirty Harley-Davidson sidecar outfits and a few cars were used to great advantage on Saturday last in giving pleasure to forty-five wounded men. In the left-hand corner are Mr. Duncan Watson, the new chief of the Harley-Davidson Co. in London, and his wife.



## TIME TO LIGHT LAMPS

GREENWICH TIME

Feb. 24th	...	...	5.57 p.m.
" 26th	...	...	6.0 "
" 28th	...	...	6.3 "
Mar. 1st	...	...	6.7 "

### Dutch Trade and America.

The Cleveland two-stroke, the American lightweight best described as a cross between a two-stroke Triumph and a lightweight single-cylinder F.N., is the latest American motor bicycle to be represented on the Dutch market.

### Motor Wheel for Sleigh.

Motor bobs are very popular in the winter in the United States, and a few weeks ago we illustrated some typical outfits. These were all driven by big twin engines, but a keen rider of Saginaw, Mich., has fitted an Auto-wheel to his sleigh.

### When did the Four-cylinder First Two-stroke?

In view of the sustained interest in the two-cylinder two-stroke machine, it is worth going a step further and to enquire into the possibilities of the four-cylinder two-stroke engine. Such a machine was built several years ago by a well-known American designer, Norbert H. Schickel. In the course of experiments Mr. Schickel built a machine of this type, the cylinders being arranged V, but as the design was not followed up it may not have proved an unqualified

## SPECIAL FEATURES

ALL WORK AND NO PLAY. SIDECAR OUTING FOR WOUNDED SOLDIERS.  
AERO ENGINES AND MOTOR CYCLES.

success. Mr. Schickel has concentrated on the single-cylinder two-stroke, and his big 6 h.p. model has occupied a sound place on the American market.

### Queries.

Among the many enquiries which we receive daily are often strange requests, many of which go to prove that the work sometimes expected of the average motor bicycle is most curious. Within the last few days we received a letter, the writer of which had taken it for granted that a motor cycle was quite as much intended to work a water pump as anything else, while another reader wanted a sidecar machine suitable for carrying five up!

### Police Trapping in the Metropolitan Area.

We very much wonder if those motorists and motor cyclists who are special constables, and who in many cases have given their services, with their machines, to the Metropolitan police force, realise that they are being employed so far to relieve the police of their ordinary duties that they (the police) are now free to trap motorists indiscriminately. We should not be at all surprised to hear of several resignations among special constables for this reason, and we think that such a procedure would be fully justified. It may not be generally realised that there has been a large accession of young police recruits to the force, many of them men of military age, who would undoubtedly be doing better work in fighting for their country than skulking behind hedgerows in plain clothes, doing work as unpleasant as it is un-English.



Gunner J. H. Pearson, a motor cyclist scout attached to the No. 3 Battery, M.M.G.S., who has been killed at the Front after many months' active service. It is reported that Pearson, whilst riding his machine, met his death from a bursting shell.

### Police Timing by Flashlight.

Referring to the timing of motorists by police with flashlamps at Bromley, a correspondent writes: "I recently saw the same thing happening about nine o'clock on the north side of Clapham Common. As soon as a motorist went by, the constable would run to the middle of the road, hold a lamp quite near the ground, and make a flash."

### "Keep Out!"

The above notice is fixed on the door of the experimental department of the Indian factory at Springfield, Mass. From which one gathers that every step is taken to keep secret until perfection all efforts for improving the Indian motor cycle. Why not a soldier with fixed bayonet—that is, provided the U.S.A. army authorities have a man to spare.

### An Awkward Position.

Recently a motor cyclist who had taken his machine from Coventry to London by train was stopped when leaving Euston Station by a policeman, who asked him if he was the owner of the machine. After answering in the affirmative, he was next asked to prove it, and being unable at the moment to do so was requested to accompany the constable to the police station. Before doing so, however, the motor cyclist searched his pocket book and luckily found the registration form for his machine. Whereupon the constable apologised for having stopped him, and he was able to proceed on his way.



WOUNDED SOLDIERS' SIDECAR OUTING.

The start from St. Thomas's Hospital, Westminster. (See pages 182 and 183.)

**The National Relief Funds.**

At the week-end the principal war funds stood as follows:

The Prince of Wales's National Relief Fund	(£2,978,000 distributed)	..	..	..	..
Tobacco Fund	..	..	..	..	..
Fund for the Sick and Wounded	..	..	..	..	..
The Queen's Work for Women Fund	..	..	..	..	..
The Belgian Relief Fund	..	..	..	..	..

**Healthy Recreation.**

Did any sane man ever question that a little relaxation at week-ends is beneficial to a worker's output? Some busy-bodies would deprive munition workers and military motor cyclists of a week-end run on the open road, but they are not likely to succeed. The subject is referred to in a leading article and in our letters pages.

**The War Savings Committee's Appeal.**

As was to be expected, many of the daily-papers have taken advantage of the recommendation of the National Organising Committee for War Savings to inveigh against motoring and motor cycling. Of course the recommendation that money should not be spent upon useless extravagance is a good one, but why should motorists be singled out and accused of selfish and thoughtless extravagance? We contend that there is at the present time very little pleasure motoring of any description, and that far less is spent upon this kind of amusement than, for example, upon cinema shows. Was it not lately stated that the American films imported into this country (many of them not only weak, but injurious to the morals of the young) amounted to no less than £2,000,000 per annum? Can any such figures be quoted against pleasure motoring? We think not.

The *Daily Mirror* in particular has excelled itself, and has called a "motor trade expert" to its aid. This person makes the following extraordinary statement: "The average motor car is in charge of a chauffeur, who can do his

own minor repairs; the motor cycle is ridden by an amateur who, as a rule, can do nothing." We were about to say that if we substituted "office boy" for "motor trade expert" we could understand this, but on second thoughts we refrain—it would be an insult to the average office boy. The fact is that motor cyclists, as a rule, know much more of the interior of their machines than car owners. Then again, what about the chauffeurs? Ought not they to be serving their country? We fear our contemporary has spoken without reflecting, whereas . . . *Verbum satis sapientibus.*

**Retribution.**

An engineer was remanded at West London last week on the charge of stealing two motor cycles the property of Mr. Stuart Scott and Mr. J. E. Sharples. The fact that the latter's machine was missing was announced in our columns, and a few days later we received a note from Mr. Sharples, saying that, owing to the publicity given in *The Motor Cycle*, his machine had been restored to him.

**Nailsworth Ladder Climbed by 3½ h.p. Sidecar.**

A party of Bristol motor cyclists made a journey a few days ago to Nailsworth, near Stroud, to witness E. Kickham make an attempt on the notorious test hill, Nailsworth Ladder, with a 3½ h.p. Sunbeam and sidecar. At the first attempt the machine came to a standstill within a few yards of the top, owing to the driving wheel getting into a deep rut. On the second try, however, Kickham, we are told, made a perfectly clean ascent, and it is claimed that this is the first clean ascent of this hill to be made with a 3½ h.p. and sidecar with passenger. An 8h.p. Sunbeam and sidecar also made two attempts.

**Ford Yarns.**

A selection of Ford stories sent in by readers (including a number from the trenches) appear on pages 191 and 192. The prize has been awarded to J. B. Carroll, of Thorndene, Lytham.

**A Well-known Essex Rider Killed.**

Sec.-Lt. Mark Head, York and Lancs Regt., attached Royal Flying Corps, has been killed whilst flying over the enemy's lines in France. Mark Head was vice-captain of the Colchester and District M.C., and well known locally. He was one of the few private owners to take part in the Paris-Nice trial of 1912, when he rode a 3½ h.p. Zenith and received a silver medal. He saw twelve months' service as a despatch rider before receiving his commission.

**Exclusive Features.**

Following upon the first illustrated report of the hill-climbing expedition in Gloucestershire published in *The Motor Cycle*, and the hill-climbing feats in the Peak District, we give to-day the first illustrated description of the wounded soldiers' sidecar outing held on Saturday last.

Among designs new to motor cyclists, the 1917 model 4 h.p. chain-driven Douglas, the horizontal twin two-stroke Levis 422 c.c. engine, the Douglas of 1912, the Starley front fork, Parker's variable gear, and the 1916 Radco have been exclusively dealt with in our last three issues. *The Motor Cycle* is the only journal regularly dealing with week-end events.

**Monopolising Australasian Records.**

We have already published (page 135, February 10th) records put up in Victoria by Erwin G. Baker, riding a 1916 model Powerplus Indian. In addition to three hours, six hours, 200 miles, and 1,000 miles records, we learn by cable that the following were also established:

Twelve hours	..	576 miles
Eighteen hours	..	876 "

Chief interest centres round the 1,000 miles, the time for which was 21h. 3m. (=48 m.p.h.). Further information to hand states that the only stoppage other than for food and fuel (fifty minutes) was to change a valve. There was a high wind and rain throughout, and Victorian roads, over which the run was made, are nothing to boast about, though doubtless a comparatively good circular course was chosen. It is claimed that the Indian now holds every Australian record from half to 1,000 miles.

**Previous Records.**

Ivan B. Hart-Davies, who has made several remarkable runs on light cars and motor cycles on our famous End-to-end route, considers Baker's 1,000 miles a marvellous performance, and suggests that when the war is over Baker should come over here and see how long it would take him to go from John-o'-Groat's to Land's End. In the run made on a 3½ h.p. Triumph in 1911 Hart-Davies in the twenty-four hours out from John-o'-Groat's covered roughly 725 miles.

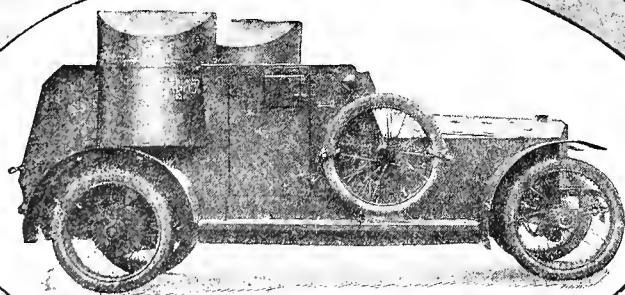
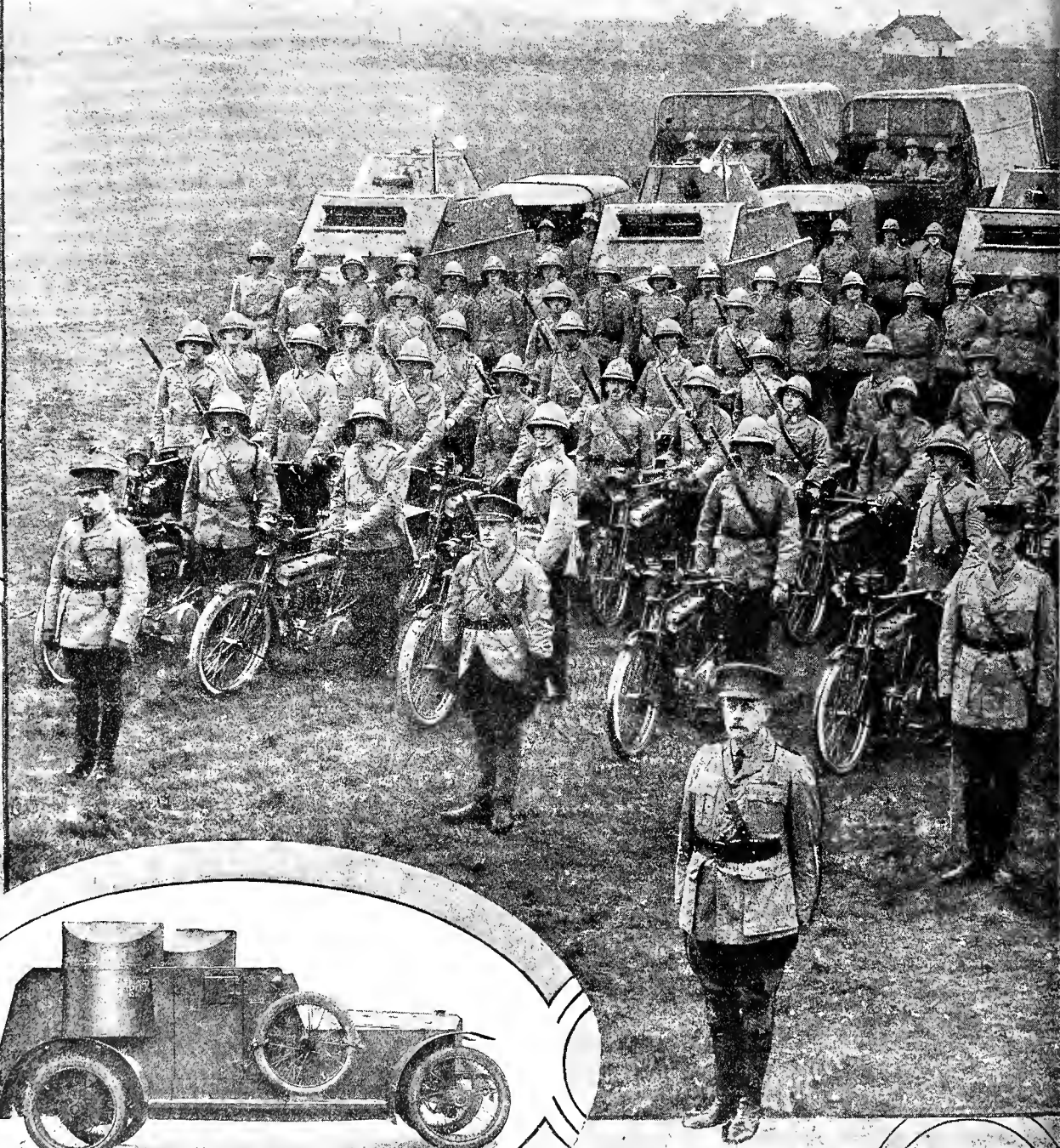
In May, 1909, H. A. Collier, riding a Matchless on the Canning Town track, covered 775 miles 1,340 yards in setting up the first twenty-four hour record.

**HONOURS FOR MEN OF THE MOTOR MACHINE GUN SECTION.**

Sgt. E. R. Mackey, awarded the D.C.M. for conspicuous service at Hooze, and Gunner J. Rafferty, who received the D.C.M. and 3rd Class Order of St. George for sticking to his post at Hill 60.







## The First Armoured COMMANDED BY SIB

Photograph taken at a parade prior to the Battery's departure overseas. The machine gun



## Motor Battery.

IN WILLOUGHBY.

are mounted on armoured cars, motor cyclist mounted infantry forming the support.

## "THE MOTOR CYCLE" RECRUITING SECTION.

### Vacancies in the Motor Machine Gun Service.

**T**HE Waiting List for the above Service—which was a fairly lengthy one—is now being drawn upon, and it may be that the list will not provide all the recruits required. A form of application appears below, and experienced motor cyclists are invited to fill in the particulars required, afterwards posting the form to Mr. Geoffrey Smith, Editor, *The Motor Cycle*, Coventry. The terms of enlistment in the M.M.G.S. are briefly as follow:

Pay, 1s. 2½d. per day, all found; the usual separation or dependents' allowance; enlistment for duration of war; overseas service.

Those readers who apply should not expect their acceptance by return of post, as usually a large number of applications are received.

### APPLICATION TO JOIN THE MOTOR MACHINE GUN SERVICE.

Name .....

Address .....

Chest measurement ..... Height .....

Group No. ....

or

Class No. ....

How long have you been a motor cyclist? .....

Can you execute running repairs? .....

Have you had any previous military training, and, if so,

when? .....

Are you medically fit? .....

Occupation .....

When free .....

After filling in the above particulars return to:

MR. GEOFFREY SMITH,  
Inspecting Officer,  
19, Hertford Street,  
COVENTRY.

[Issue Feb. 24th, 1916.]

## MOTOR CYCLISTS PROMOTED.

We notice the following promotions in the official *Gazette*: Royal Engineers (Motor Cyclist Section)—Temp. Sec.-Lts. to be Temp. Lts.: W. Pyemont, F. R. Walls, A. Q. Roberts, C. J. Cadman, A. H. G. Kerry, J. A. Scrutton, H. B. Blower, C. S. Burney, H. J. Payn, and C. G. Brocklebank.

A.S.C.—Temp. Sec.-Lts. to be Temp. Lts.: S. W. Carty and R. W. Lovegrove.

## THE BRITISH INDUSTRIES FAIR.

### An Exhibition of British Manufactured Goods.

**T**HIS exhibition, which opened on Monday last, is of some considerable size and is devoted to those goods formerly bought from enemy countries, but now made just as well in Great Britain. The fair is easy of access, being in the Victoria and Albert Museum and quite close to South Kensington Station. The wares shown are for the most part such articles as toys, photograph frames, fancy goods, pottery, and glass.

Few firms of the engineering and allied trades are represented, and the only exhibits which will interest the motor cyclist are those of three or four electrical firms, and even on the stands of these we failed to find a single British-made magneto. The Effandem Co., Ltd., of Wolverhampton (stand A3), show an inspection lamp which can be attached to a button on the coat or tunic, the battery of which is carried in a sling case, and a cycle lamp which might be used on a lightweight for town riding. The stand (A 16) of Messrs. Ward and Goldstone, Manchester, was hardly ready. The goods displayed there consisted of the firm's patent dry batteries, accumulators, armoured cable, high-tension wire, and other electrical adjuncts. The British Ever-Ready Co. showed an inspection lamp and numerous lamps of the portable variety. No serious effort appears to have been made by the motor cycle trade to exhibit goods formerly purchased from enemy countries, such as watches, clocks, handle-bar mirrors, to say nothing of cheap horns and lamps or even magnetos. The Fair will remain open till March 3rd.

## MOTOR CYCLING IN FRANCE.

**W**ITH the present outcry against "pleasure" motoring in this country, it is interesting to compare the present state of things in France. Upon the outbreak of war cars and motor cycles were commandeered on a much larger scale than in England, and with conscription in force it followed that the number of motor vehicles on the road was considerably reduced. At the beginning, too, motorists were held up by soldiers at practically every bridge and level crossing for the examination of passports. The passport system has since been modified, and the French military authorities have established a special *laissez passer*, which allows one to circulate more comfortably in the "interior zone."

There is still a good deal of car traffic in Paris, but motor cycles have decreased, and a sidecar outfit is a rarity. In this connection, however, it should be remembered that sidecars are not so popular in France as in England. A further call has recently been made on the Paris taxicabs, and, repainted grey, they are used for the transport of officers.

As regards petrol, there was a scarcity for private users at the beginning of the war, but the situation was soon relieved, and until quite recently it has been easily obtainable, the price in Paris being 2s. 10d. per gallon. On February 10th, however difficulties were encountered in delivery, and a 25% price increase was made. This rise evidently corresponds with that in this country.





The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cyclist," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

#### Support for "The Motor Cycle" Spring Frame Campaign.

Sir,—Your correspondent "Ex-L.-Cpl." has my profound sympathy. I daresay I shall have his when I tell him that road shock has brought my motor cycling pleasures to an abrupt end. My Triumph was fitted with Brooks best saddle on a N.A.G. pillar. On ordinary roads the riding was luxurious, but the pot-hole stretches broke through all springs, and the shock to the spine was more than my advancing years could stand. I have sold my machine and gone back to the Raleigh, trusting to the Triumph promise to make good to us all when the war is over. Rear spring-riding alone will solve the problem.

W.J.C.

Sir,—Referring to the letter "Ex-L.-Cpl." on page 168 of *The Motor Cycle* of February 17th, I would recommend him to investigate the spring seat-pillars as supplied on 6 h.p. A.J.S. machines. I have one on my machine, and as a substitute for a spring frame I think it is as good as anything I have seen.

L. BLACKBURN.

#### The Isle of Man.

Sir,—I notice in your issue of the 3rd inst. a letter from the Rev. E. H. Stenning in reply to a reference to the Isle of Man S.P. Co.

Those who made a certain sea voyage on December 24th will probably never forget the Isle of Man Steam Packet Co., for it was blowing a gale with a very bad sea running. I have crossed to the Island on this ocean greyhound in fine weather, but little did I ever think that I should be on her with such a sea running and in the depths of winter.

The boat in question is not the only craft of the company that is doing similar work; there are others! Some of my friends have had "some" crossings.

I wonder if the Rev. E. H. Stenning has any idea what has happened to the ocean sleuthhound *s.s. Fenella*?

Re the latter part of the letter, surely all good motor cyclists have long ago joined the Colours? But let us wait until we have given the Huns their final strafing, and then for the Island and the T.T.

ALUMINIUM.

#### Two-stroke Design.

Sir,—I should like to reply briefly to Mr. Hughes regarding the points he raises in last week's issue of your paper.

His contention that the piston has to do extra work owing to the greater negative pressure on it during its cycle is hardly correct, for there is less negative pressure on it during its upstroke, i.e., when it is drawing in new gas, so that one balances the other. In fact, I should say the negative pressure on the upstroke is the more serious, for to overcome it power must be taken from the momentum of the flywheel, and at a time when it can ill be spared. His second contention about the increased amount of petrol lodging in the crank case is entirely wrong, as a little forethought would have shown him. Again, a high compression, or volume to be compressed, does not necessarily give a high efficient mean pressure, so his remarks under this heading are also wide of the mark.

I agree with him regarding the limits of the usual type of compression release valves, and I presume he includes his own firm's design in his rather sweeping assertion, for to me it seems a rather dangerous practice to pass back hot exhaust gases into the transfer port, while the advantages are of very doubtful value, and, to my mind, not worth the risk.

JAMES MARTIN.

#### Two and Four-stroke Lightweights.

Sir,—With reference to your footnote to my letter to you which you have reproduced in the last issue of your paper, I had in my mind when I wrote the matter of lightweights; I do not call a 180 lb. machine a lightweight. A machine of 100 lb. or under is the only type that can be termed a light motor cycle with a cubic capacity of 250 c.c. and under, which I note is what you refer to in your leading article, and which is what we take exception to.

The  $3\frac{1}{2}$  h.p. 500 c.c. M.A.G.-engined Motosacoche does not weigh 180 lb., and I cannot imagine anyone calling that a lightweight; also I cannot understand why a machine manufactured as a lightweight should reach this weight.

THE M.A.G. ENGINE CO., LTD.,

OSBORNE DE LISSA, Director.

[We should be glad to learn the names of any variably-g geared four-stroke lightweights suitable for Government requirements with engines of 250 c.c. and scaling 100 lb. It is instructive to note that the lightest machine in the Junior T.T. of 1914 was the  $2\frac{1}{4}$  h.p. 269 c.c. two-stroke Ivy, which scaled 159 lb., whilst in the A.C.U. Six Days' Trials of 1914 the lightest machine was the  $1\frac{1}{2}$  h.p. 162 c.c. Dayton, weighing 143 lb.—Ed.]

#### Pleasure Motoring.

Sir,—I notice several newspapers give publicity to the above, in regard to the suspension of all pleasure (so-called) motoring. I do not follow the Committee in its arguments, but doubtless abler pens than mine can defend the cause of the comparatively few "pleasure" motor cyclists. Under the Military Service Act, a large proportion of motor cyclists will be serving their country, thus automatically depleting the ranks of the "pleasers." To penalise those who, through physical disability or Anno Domini, remain civilians, and who are probably working under considerable stress, seems to me oppressive. Every gallon of spirit used contributes appreciably to the National Revenue, and to many a man the motor cycle or combination is his only means of relaxation. How many a wounded soldier has received benefit from motorist or motor cyclist who has placed his vehicle at his service for outings and drives? Does the War Savings Committee really think that by depriving the sorely pressed and worried garage proprietor of his living and connection, that it has taken perhaps years to build up, it will render financial service to the country?

It is difficult perhaps to write dispassionately, as an interested party, but surely other and more obvious economies are nearer to hand.

W. H. GOODENOUGH.

Sir,—I think, to put the matter plainly, the people who are endeavouring to stop motor cycling for pleasure, so as to economise, are very much on the wrong track. Generally to ban this form of recreation without making sure what the effect will be is, to my mind, very doubtful "economy."

If you will permit me to voice my own case I shall be drawing a parallel with thousands of precisely similar ones. I am an engineer working in a Government establishment on work which requires the best skill and attention. For the past eighteen months I have been working from 6 a.m. to 9 p.m. six days a week, and, in addition, two Sundays out of three. The few hours that I get I utilise to take my wife and daughter for a spin in the country, as I happen to be the possessor of a  $3\frac{1}{2}$  h.p. combination.



Those few hours of relaxation from the ordinary groove, change of scenery and air, have enabled me to boast that I am the only one out of a dozen on my job who has not been absent from work an hour through sickness. Panic remedies, for economising will neither bring the much-needed revenue nor win the war, besides inflicting unnecessary pin pricks on men and women who are doing their bit. W. JONES.

Sir,—My attention has been drawn to the recent appeal by the National Organising Committee for War Savings, which infers that there is still a great deal of pleasure motoring and resultant wastage of labour, etc.

This appeal is calculated to create an entirely erroneous impression, and is apparently based on an incomplete knowledge of the actual facts. The records of the Automobile Association and Motor Union, which has a membership of over 90,000, show clearly that the number of persons who are now keeping their cars for purely pleasure purposes is infinitesimal, and that, on the contrary, motorists as a class are rendering invaluable services to their country in the present crisis.

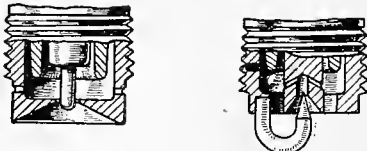
For instance, practically every wounded soldier returned from the Front has been transported from the railway stations to the hospitals by privately-owned motor cars without expense to the military authorities. In another direction, viz., recruiting, the Association made arrangements by which in every district in the United Kingdom the Officer in Charge had motor cars placed at his disposal. This represented a free gift to the country of more than a million miles. Many other instances could be quoted, but the two mentioned will give some idea of the extent to which the efforts of private motorists have been and are still being devoted to national purposes. It is hardly necessary to enlarge on the enormous saving to the country effected by this voluntary assistance.

With the need for economy in the use of motor vehicles for private purposes it is impossible not to agree, but, on behalf of the members of this Association, I feel that the misleading character of this appeal cannot be too strongly deprecated.

STENSON COOKE (Capt.),  
Secretary, Automobile Association and Motor Union.

#### Sparkign Plug Design.

Sir,—Adverting to the letter in your issue of the 17th inst., *re* the above, appearing over the name of the Sphinx Manufacturing Co., we note that the illustration B, taken from our patent specification, is, of the several arrangements illustrated in the said specification, the least like Lt. Burton's proposed sparkign plug, and, in fairness to us, we will therefore ask you to publish the corresponding part of figs. 1 and 2 of our specification.



The Forward patent sparkign plug.

We think that the Sphinx Manufacturing Co. may find in these illustrations the prototype which they fail to find in the particular arrangement which, for some unforeseen reason, they have thought well to select from our specification for the purpose of their remarks.

THE FORWARD MOTOR CO.

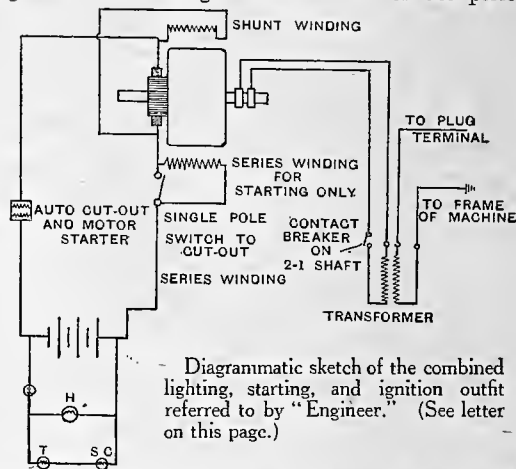
#### A Suggested Electric Outfit.

Sir,—There have been many references in *The Motor Cycle* lately to electric lighting and ignition outfits.

I think, personally, the final scheme will be something like the one shown in the enclosed sketch. The generator—I hate the word dynamo—will develop into a little rotary converter delivering low voltage alternating current at two slip rings at one end of the armature, and direct current at the commutator at the other end.

The field of the generator should be compound wound, a single-pole switch being provided for shunting the series

winding. Such a machine would be capable of starting the engine, as well as supplying ample juice for lighting and ignition purposes. The batteries should be of the Edison nickel-iron type, which are best suited for the heavy demands of a motor cycle. The operation of starting up would consist of opening the switch, thus putting the series winding in circuit, then closing the auto cut-out, provision being made for holding the cut-out in for the period re-



quired for starting up. As soon as the generator commences "revving," alternating current will be delivered at the slip rings, which will pass through the transformer (no contact breaker is, of course, required, as the current is alternating), which will step it up to the requisite voltage to jump the gap of the plug. When the engine gets up speed the series winding of the generator should be short circuited and the cut-out left to its usual functions. If the generator is gear or chain-driven, provision might be made for the contact breaker to break when the pressure wave is at its maximum value.

In this type of machine there is no necessity for a fine wire to be used for the armature winding. The only winding with a large number of amp. turns would be the secondary winding of the transformer. The transformer could, of course, be adequately protected from the elements by putting it in a vulcanite case.

ENGINEER.

#### Four-cylinder Motor Cycles.

Sir,—Mr. Hallam must indeed be a very prejudiced motor cyclist if in his opinion a four-cylinder motor cycle is the only one worth riding. Has he ever ridden a good  $3\frac{1}{2}$  h.p. single? It seems doubtful from the general trend of his letter. I have ridden several four-cylinder F.N.'s, and can quite realise their many good points, but it must always be remembered that a good  $3\frac{1}{2}$  h.p. single has, roughly, only a quarter of the amount of wearing parts in the engine that a four-cylinder has.

Four-cylinder petrol engines are all very well for cars, but the average motor cyclist has neither the time nor the patience to bother with a multitude of working parts (all of which are quite likely to give trouble), when a very much smaller number will quite satisfy his needs.

Mr. Hallam should use his eyes a little more than his pen, and he would then perhaps see that at least one of the best English motor cycle firms fits the front fork springs in "grease-packed cylinders." I am speaking of Messrs. Rudge-Whitworth, Ltd. I have a 1912 T.T.  $3\frac{1}{2}$  h.p. single Rudge with free engine, and ride this machine on an average of sixty miles a week, and can safely say that it is always ready to be ridden, does not require decarbonising more than once in 3,000 miles, and does not require a new inlet valve spring every 1,000 miles; it is practically a no-trouble mount.

BASIL BATE.

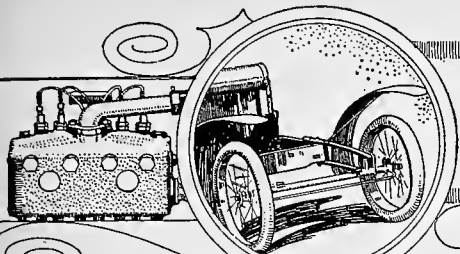
### "THE MOTOR CYCLE" SUBSCRIPTION RATES.

The rates for direct subscription to "The Motor Cycle" have been reduced, and are now as under:

Great Britain 6/6 All places abroad 10/10 per annum.

Subscriptions should be addressed to: The Publishers "The Motor Cycle," 20, Tudor Street, London, E.C.

P.O. Orders and cheques to be made payable to "The Motor Cycle."



## 4D FANCIES.

It is now quite a regular thing where motorists congregate to pass jokes respecting the Ford car, or "Flying bedstead," as it is affectionately termed, though some prefer the "galloping bedstead." In response to a recent paragraph a shoal of replies were received, and we submit the following selection with apologies to the Ford Co., Ford agents, Ford owners, people who have ridden in Fords, and people who have seen Fords.

**A** GARAGE proprietor, storing several Fords, having upset some insect powder on the floor of his garage rather late at night, decided to leave the sweeping-up process until next day, and upon entering the premises in the morning found four of the Fords on their backs! The Americans often refer to "road lice."

In 1917 Fords are to be fitted with a new pattern speedometer. At 10 m.p.h. a little blue electric lamp lights, at 20 m.p.h. a green one, at 30 m.p.h. a red one, and at 40 m.p.h. a small gramophone plays "Down Among the Dead Men."

**BIRMINGHAM PANTOMIME ARTIST:** "You don't need a speedometer with a Ford car!"

"Oh! Why?"  
"At ten miles an hour the bonnet rattles, at twenty miles an hour the screen rattles, and at thirty miles an hour your ribs rattle! It's a rattling good car!"

A Ford car was hurtling along the road one day, when by accident it ran over a little cock sparrow. The sparrow, of course, knew the make of car, having seen so many, and in his desire to have his own back his dying cry was "Cheap! Cheap!!"

**BREAKFAST TABLE PROBLEM.**—"Can I afford a Ford with an Off Ford body?" (We had better explain, for the benefit of the uninitiated, that Offord and Sons are well-known makers of special bodies for Fords.)

Policeman to chauffeur, who is vigorously turning the starting handle of a Ford: "Have you a licence to play? If not you must accompany me!"

Chauffeur: "With pleasure! Suppose we lead off with 'Rule Britannia'?"

"Say, how much do you want for your Ford car?"

"£70; and I'll throw a squirrel in with it."

"Why a squirrel?"

"Well, it will be useful to run behind and pick up the nuts."

"My car cost me £300."

"Why, I bought a rattling good one for £150."

"Yes—I have heard it!"

It is a case of "A short life and A-merry-can!"

It may not be generally known that Mr. Ford knows what a good car is, and owns a British-made Rolls-Royce. One day a friend asked him why he went in for a Rolls-Royce, and he replied that his factory was so busy producing Fords for other people that he could not get one for himself, so he bought the next best thing to it!

It is said that Henry Ford has made plans to shorten the wheelbase in 1918, the reason ascribed being that he can thus get more cars into this country.

A motorist was seen wandering about with a starting handle in his hand and striking match after match as he bent peering to the ground. Asked what he had lost, he said: "I was cranking up my Ford, gave the thing a good sharp pull and it flew out of my hand, and now I can't find it anywhere. Mind you don't tread on it."

A dealer in scrap metal sent a consignment to the Ford Co. by mistake. They acknowledged the parcel, and added that his car had evidently been in a bad smash. The repairs would be so extensive that they recommended the purchase of a new machine.

An owner of a Ford called at the works and asked to see the manager. On the arrival of that worthy the Ford owner greeted him with the following: "I believe that this works turned out a complete car in the space of twenty minutes." The works manager beamingly answered in the affirmative. "Well," replied the Ford owner seriously, "I'm convinced I got that one."

A man, after numerous unsuccessful attempts to obtain the return of his Ford car which had been stolen, put an advertisement in the evening paper to this effect:

"If the person who stole my Ford car last week does not return it to me by eleven o'clock to-morrow morning he will have to keep it."

Next morning, on looking out of his window into the street below, he found it packed with Ford cars as far as the eye could see.

Mr. Henry Ford's statement about the War Loan, as is well known, has made him very popular among the Allies! It will be recalled that when the loan was floated in the States he urged Americans to have nothing to do with it, and said that he would tie a tin can on to the loan commission's tail and scuttle it home again. Why a tin can? Why not a Ford car?

A Ford—a tinsmith's dream!

An agent was trying to sell an owner of a Ford car a speedometer, but his reply was, "Quite unnecessary, I have a cuckoo clock, the cuckoo of which sings, 'This is the life for me' when at speeds above 20 m.p.h."

Henry Ford has been lately dubbed the "Pieces Maker."

A Detroit marine merchant one day happened to strike a bit of luck and got a load of old iron bedsteads. The day being rather warm he stopped for some refreshment outside the Ford works. Suddenly a bustling manager came out of the works, and seeing the consignment, rushed in again, reappearing with a foreman. They approached the "thirsty one's" cart, and the manager was heard to remark, "I wonder who the deuce let this man have these chassis?"

A Ford will go anywhere—except in Society.

A wealthy gentleman went touring in the States with his big limousine. Owing to the very bad condition of the roads he affixed an electro magnet under the car to pick up nuts, etc., that might get shaken off his car. At the end of the first day the "bag" included a Ford car.

A gentleman driving a 50 h.p. limousine had the misfortune to have a bad skid, which landed him into a very deep ditch, with the result that with all his skill and horse-power he could not get back on to the road. Presently along came a Ford car, and the owner, seeing the trouble, attached a chain and pulled the unfortunate car back on to the road. After thanking the Ford owner, the gentleman turned to his chauffeur and said, "James, buy one of those things to keep in the toolbox."

## 4d Fancies.—

A gentleman drove up on a Chinese Rolls-Royce one day, and happened to stop near a school playground. It was cold, and on dismounting he proceeded to spread a rug over the radiator to keep it warm. An intelligent little boy, seeing this, ran up to the owner, and exclaimed, "It's no good hiding it, guv'nor, we saw what it was."

History lesson: Mr. Henry Ford, the man who popularised — walking!

Mr. Chas. Y. Knight, inventor of the Knight sleeve valve engine, tells a good story of Fords. An owner of one of these "Chinese Daimlers" living in the States advertised his car for 150 dollars, and got no replies. Accordingly he reduced the price to 70 dollars, but still no result. After another unsuccessful try at 40 dollars, he inserted an advert. to this effect:

"The Ford car I advertised for sale will be put outside my house at seven o'clock to-morrow evening, and anyone desiring it may take it away without charge."

At the appointed hour, the family, curious to see the kind of man who had seized upon the offer, drew aside the curtains to peep out of the window, and what do you think they saw? *Five more Fords drawn up behind.* The owners had taken advantage of the advertisement!

An American knut met two revue girls, and offered to take them for a joy ride in his car. They arranged to meet, and duly turned up at the appointed time. Eventually the knut arrived in a Ford. "Kid," said one of the girls, "it's a Woodbine."

A lady, wishing to purchase a car, entered a garage, but found she had forgotten the make of the car she had decided upon. All she could remember was that it started with "T." The garage proprietor ran through a list of well-known makes, and then he remarked: "You say it starts with T(ea). Oh! you must mean a Ford: all other makes start with petrol."

A sportsman drove up to the garage at Ascot in a Ford car. "Ten shillings," announced the attendant. "Right," said the sportsman, "it's yours," duly handing over his Ford.

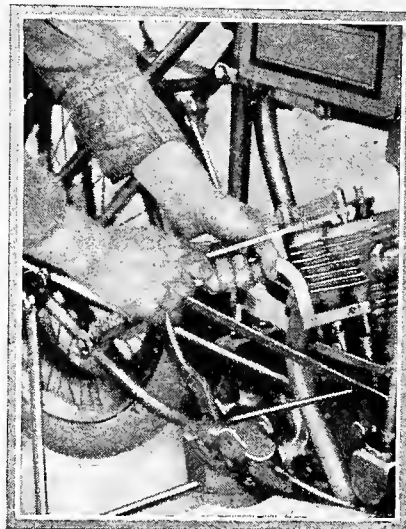
A motorist drove up to a garage for petrol. A youth departed to interview his "boss," and returned with the message, "The guv'nor says he can let you have a gallon, if that's any use." On being asked to produce it quickly, the youth, taking a gallon measure, inserted it under the petrol tank of a Ford which was standing outside the garage, bearing the inscription "For Sale." Unscrewing a small drain screw, he watched an infinitesimal trickle of petrol find its way into the measure. After about five minutes' waiting, the motorist, despairing of ever reaching his destination,

exclaimed, "Oh, never mind draining the beastly stuff out—I'll buy the car!"

A man strolled into a garage one day looking for a job, and bragged that he could tell any make of car by the sound of the exhaust. Being amused at the claim, a garage employee thought he would give him a test, and so, after blindfolding the newcomer, started up a six-cylinder Napier. "Napier!" ejaculated the blindfolded one. Correct! Next a Vauxhall was started. "Oh, that's a Vauxhall," was the correct diagnosis. At that moment a mechanic at the other end of the garage let a box of spanners fall down a long flight of steps. "Ford!" exclaimed the clever one.

## THE BOWDEN VALVE GRINDER.

MOTOR cyclists who look after their own machines know how tedious a job it is to grind in the valves. This very necessary operation has been considerably facilitated by the introduction of the Bowden valve grinder, which we show in operation on an old pattern J.A.P. motor bicycle. By its means a valve can be ground accurately with a minimum amount of labour. It will be seen that



The Bowden valve grinder in use

the valve, after a light spring has been placed underneath its head, is inserted in position; the bottom portion of the tool surrounds the stem, while the top portion, which is the shape of a screw-driver, falls into the slot on the valve head. The instrument is gripped in the left hand, by means of which the requisite pressure can be obtained, and by the right hand the rack is moved backwards and forwards. This engages with a pinion, and thus an oscillating motion is imparted to the valve, and at intervals, owing to the spring, the former may be raised off its seating, thus preventing any possibility of rings being formed in the face of the valve.

This device is marketed by Bowden Wire, Ltd., Kimberley Road, Willesden, London, N.W.

## Average Prices OF Second-hand Machines.

WE give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted. If there were not at least two advertisements, then the last average is given.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S. ....	1915 6	3-sp. sidecar ..	—	£82
" .....	1914 6	3-sp. sidecar ..	£69	—
" .....	1913 6	3-sp. sidecar ..	—	£57
" .....	1915 2½	2-speed .....	—	£50
Allon .....	1915 2½	2-speed .....	£32	—
Ariel .....	1914 3½	3-sp. sidecar ..	—	£53
" .....	1913 3½	3-sp. sidecar ..	—	£44
Bradbury ..	1914 4	3-sp. sidecar ..	—	£47
B.S.A. ....	1915 4½	3-sp. sidecar ..	£72	—
" .....	1914 4½	3-sp. sidecar ..	—	£49
" .....	1913 3½	2-sp. sidecar ..	£44	—
" .....	1915 4½	3-speed .....	—	£53
" .....	1913 3½	2-speed .....	—	£31
Calthorpe ..	1915 2½	2-speed .....	£26	—
" .....	1914 2	2-speed .....	£18	—
Clyno .....	1914 6	3-sp. sidecar ..	—	£66
" .....	1913 6	3-sp. sidecar ..	—	£50
Douglas .....	1915 2½	3-speed .....	—	£46
" .....	1915 2½	2-speed .....	£44	—
" .....	1914 2½	2-sp. kick start	£40	—
" .....	1911 2½	2-speed .....	£35	—
" .....	1914 2½	2-speed T.T. ....	—	£38
" .....	1913 2½	2-sp. kick start	—	£32
" .....	1913 2½	2-speed T.T. ....	—	£31
" .....	1913 2½	2-speed .....	£29	—
Enfield ....	1915 6	2-sp. sidecar ..	£71	—
" .....	1914 6	2-sp. sidecar ..	£63	—
" .....	1913 6	2-sp. sidecar ..	—	£47
" .....	1915 3	2-speed .....	£42	—
" .....	1914 3	2-speed .....	—	£37
A. Excelsior	1914 7	2-sp. sidecar ..	—	£55
H.-Davidson	1915 7	3-sp. sidecar ..	£78	—
Indian .....	1915 7	3-sp. sidecar ..	—	£79
" .....	1915 7	3-speed .....	£59	—
" .....	1914 7	2-sp. sidecar ..	£54	—
" .....	1914 7	2-speed .....	—	£44
" .....	1914 7	T.T., free eng. ....	—	£44
" .....	1915 3	3-sp. sidecar ..	£69	—
" .....	1915 3	3-speed .....	£49	—
James .....	1915 4½	3-sp. sidecar ..	—	£60
Lea-Francis	1915 3½	3-speed .....	—	£63
Levis .....	1915 2½	de Luxe .....	—	£37
Matchless ..	1915 8	3-sp. sidecar ..	—	£80
" .....	1914 8	2-sp. sidecar ..	—	£70
" .....	1913 8	2-sp. sidecar ..	—	£53
New Hudson	1915 6	3-sp. sidecar ..	—	£61
" .....	1915 2½	2-speed .....	—	£25
New Imperial	1915 2½	2-speed .....	£28	—
" .....	1914 2½	2-speed .....	—	£25
O.K. ....	1915 2½	2-speed .....	£30	—
" .....	1914 2	2-speed .....	—	£21
P. & M. ....	1914 3½	2-sp. sidecar ..	—	£50
" .....	1913 3½	2-sp. sidecar ..	—	£43
" .....	1913 3½	2-speed .....	—	£40
Premier ....	1914 3½	3-sp. sidecar ..	—	£48
" .....	1913 3½	3-sp. sidecar ..	—	£32
Quadrant ..	1915 4½	3-sp. sidecar ..	—	£60
Rex .....	1914 6	2-sp. sidecar ..	—	£61
Rover .....	1915 3½	3-sp. sidecar ..	—	£48
" .....	1914 3½	3-sp. sidecar ..	—	£43
" .....	1913 3½	3-sp. sidecar ..	—	£40
" .....	1913 3½	3-speed .....	£33	—
Rudge .....	1915 5-6	Multi sidecar ..	—	£41
" .....	1914 3½	Multi sidecar ..	—	£47
" .....	1915 3½	Multi .....	—	£47
" .....	1914 3½	Multi .....	—	£36
" .....	1913 3½	Multi .....	—	£31
Scott .....	1914 3½	2-sp. sidecar ..	—	£49
" .....	1913 3½	2-sp. sidecar ..	£42	—
Sunbeam ....	1915 6	3-sp. sidecar ..	—	£66
" .....	1914 6	3-sp. sidecar ..	—	£80
" .....	1915 3½	3-speed .....	—	£63
" .....	1914 3½	3-speed .....	—	£52
Triumph ....	1915 2½	2-stroke .....	£34	—
" .....	1914 4	3-sp. sidecar ..	£53	—
" .....	1914 4	3-speed .....	£46	—
" .....	1913 3½	3-sp. sidecar ..	£41	—
" .....	1913 3½	3-speed .....	£39	—
Williamson ..	1914 8	2-sp. sidecar ..	£64	—
" .....	1913 8	2-sp. sidecar ..	—	£55
Zenith .....	1914 8	Gradua sidecar	—	£67
" .....	1914 6	Gradua sidecar	—	£56

# QUESTIONS AND REPLIES

A selection of questions of general interest received from readers and the replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" on the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Carburettor Catching Fire.

**Q** (1.) I have been troubled by the carburettor of my machine catching fire when starting or stopping or running at slow speeds. (2.) The exhaust valve closes at the right time, viz., when the piston is on the top dead centre. Would there be any advantage in making it close earlier? (3.) The ignition, however, appears to be timed a little late. (4.) What would cause the engine to become carbonised on the piston top and cylinder in so short a distance as twenty miles?—A.E.C.

(1.) The cause of the carburettor catching fire is usually due to too weak a mixture, which causes popping in the carburettor, and if any spirit is about it will then ignite. It might also be due to a very weak inlet spring, or the valve failing to close properly. (2.) The exhaust valves closing when piston is on top is correct, and altering the timing would not improve matters. (3.) The ignition being timed late would not cause this trouble,

but would cause bad running and overheating. (4.) Carbon deposit is caused chiefly by over lubrication, too strong a mixture, or overheating. We should hardly think that much carbon could form in so short a distance as twenty miles.

## Fitting a Magneto.

**Q** I have a single-cylinder motor, which is fitted with accumulator and coil ignition, and gives fairly good results. I am thinking of fitting a magneto with direct drive from crankshaft, either by sprocket and chain or gearing. What gear ratio do I require for correct firing?—A.R.

You require to drive the magneto at half the speed of engine. You will probably find the simplest method to drive it will be by chain, fitting one sprocket to the pinion at present carrying the contact breaker cam, which is naturally geared 2-1, so no further reduction will be necessary.

## Alterations for Speed.

**Q** I have a 3 h.p. twin Enfield, and I should like to convert it into a racing machine. Could you kindly tell me the principal alterations I shall have to make?

I may mention that I have a workshop with lathe, etc., and could make new parts. (1.) As the engine keeps very cool, would a higher compression be advisable? I could raise compression by making deeper caps that screw on the top of the cylinders. If such caps were made of duralumin (aluminium alloy), would the difference in expansion crack the cylinders? (2.) The plugs are on the side of the cylinders in a recess. Would it be better if I fitted them in the cylinder head? (3.) What timing would I need for racing, and why is such timing not suitable for touring? (4.) My top gear is 5 to 1. Shall I make it any higher? (5.) I have taken 4½ oz. off the pistons and connecting rods. Will it make much difference?—C.D.

(1.) An engine when used for racing purposes only will frequently give greater speeds with a slightly higher compression than usually used for touring; but great care has to be exercised in not getting it too high, otherwise you may do a great deal of damage. You will probably find that with a higher compression the engine will be very prone to knocking at slow speeds, and will probably run considerably hotter unless great care in driving is used. We do not think it would be advisable to make the caps of aluminium alloy as the heat expansion is very much greater than that of cast iron. (2.) For high speed it is more usual to fit the plugs in the cylinder head, but they are very liable to become oily when in this position. (3.) Valve timing for racing machines varies very considerably; in fact, really each individual engine wants a special timing of its own to obtain the very best speeds. It is usual on racing engines to give a certain amount of overlap to the valves, and, as a rule, the lift is greater, and rise and fall quicker, than for touring purposes, the result being noisy tappets and more rapid wear and tear on all valve gear and timing. It is chiefly for these reasons that racing timing is not used on touring engines. (4.) For speed work you would probably obtain better results with a higher gear, say 4½ to 1. (5.) Unless you have rebalanced the flywheels after removing the weight from the pistons and connecting rods you will probably find that the running will not be so good, owing to bad balance.



Miss Dodds, the rider of a 6 h.p. Enfield two-speed passenger outfit, photographed at Mam Tor, Derbyshire.



**Driving Licence for the Deaf.**

**?** I shall be glad of your advice as to how I can obtain a driver's licence. The young man who lives with us and myself are both deaf mutes, and recently we went to our police office to apply for a licence, but the Chief Constable said it was too dangerous for us and that he could not take the risk of granting us a licence, but suggested we interviewed the Watch Committee a week later. We have got a second-hand  $3\frac{1}{2}$  h.p. Triumph motor cycle, 1909 model with 1913 engine, waiting for us at an agent's shop. I do not see any reason why we should not be granted a licence on account of our being deaf. It is not only the ears that one has to depend upon to avoid accidents. I have ridden a push bicycle for over twenty years without any accident at all through my deafness. Nowadays ladies and mere boys are driving motor cycles, and it is very unfair not to allow a capable deaf mute to enjoy the advantages of motoring, especially for me, as I want one for my business as well as for week-ends. Some years ago I cycled all the way to London from Rotherham in one day, alone, and after three days' stay there returned again without meeting with any mishap.—G.H.B.

The local police authorities cannot refuse to give you a licence on the grounds that you are deaf and dumb. Beyond the age limit, there are no strict regulations as to the issuing of driving licences, and if the police refuse when you apply again we would suggest that you ask them to show you the authority on which they refuse.

**Starting Difficulty.**

**?** I am the possessor of a twin-cylinder, belt-driven, 1912 5.6 h.p. Rex, which I find extremely hard to start up. It is fitted with a Bosch magneto, B. and B. carburetter, two-speed gear, and handle starting. When cold the engine is very stiff, and only when a good deal of petrol has been injected is it easy to move it. The compression is very good indeed. I use T.T. Mobiloil. The spark is very good, and I have fitted two new plugs. It takes me fully a quarter of an hour to get going, which I think rather a long time.—T.F.B.

Difficult starting is nearly always due to one of two causes, or perhaps a little of both—that is, poor carburation and a poor spark. The engine being so stiff to turn over when cold is due to the congealed oil between the cylinder and piston, and if the oil is very heavy the film between the crank case and flywheel often makes the engine stiff in cold weather. You should use a light oil in winter. To obtain easy starting there

must be no air leaks between the carburetter and engine, or *via* worn valve stems or carburetter slides. Bind up any doubtful joints with adhesive tape. What is wanted is a strong mixture, and not much of it. Try starting with air shut right off and throttle about one-third open only. The plug points should be clean, and not adjusted either too near or too far apart. About  $\frac{1}{16}$  in. is correct. If petrol does not free the engine sufficiently when starting, try a little paraffin. You should make sure the rocker arm on the contact breaker is quite free, and that the points are separating the correct distance—.4 mm.

**Piston Rings Carboned Up.**

**?** I have a  $2\frac{1}{2}$  h.p. two-stroke motor cycle. Some months ago the engine came back from the makers with a new crankshaft, piston, and bearings. I have since not been able to get anything like the same power out of it, and I have to use more than twice the amount of petrol. Just lately I took the cylinder head off and found the piston rings jammed. Moreover, they did not fit even when cleaned and the groove cleaned of all carbon. After fitting properly the result was wonderful; all the original power came back, but after about 100 miles I found the power fell off again. The bicycle would be running quite well perhaps, then gradually pull up with a grating noise. If I retarded the spark and gave very little air the bicycle would just take me along at about twelve to fifteen miles per hour, then, without any apparent cause, off it would go again, and after a mile or so repeat the process. On again examining the piston rings I found them gummed up, and also I found the two holes in the transfer port stopped up with carbon. These I cleaned out, and recently I could get no power, but used very much less petrol than I have been doing. Can you tell me (1) why the rings should have got dirty so quickly? (2) How I can clean out the transfer port thoroughly? (3) Would overheating be due to the spark being too far advanced? I advanced the ignition timing a few weeks ago, and seemed at the time to get better running and no knocking.—R.W.B.

(1.) The cause of the piston rings jamming is that the engine has been working rather hot. This may be due to (a) poor quality oil, (b) bad fitting piston rings, (c) too rich a mixture, (d) over gearing, or (e) overloading. (2.) The way to clean the transfer port is to remove the cylinder, scrape the port with a suitable tool, and wash it in paraffin. (3.) The spark being too far advanced would not cause these symptoms; it would simply cause knocking. The cause of the machine pulling up is probably pre-ignition, due to overheating or a faulty plug.

**Re-magnetising a Magneto.**

**?** We have a 20 h.p. petrol motor, which will not run on the magneto. We think that the magnets want remagnetising. The only means at my disposal is a 60 volt lighting circuit (from accumulators) with an average load of 30 amps., and I thought of winding each magnet (there are three) with as many turns as possible of 1.18 in. wire and connect in series with the lighting circuit. I would get about seventy turns on each. The lifting power of each magnet is now 4 lb. If you think the magnets need remagnetising, is my method any good; if not, which is the best way?—J.M.

If your magnets each have a lifting power of 4 lb. we should say that they do not require remagnetising, and that the trouble probably lies in the winding or insulation of the armature, or perhaps to a faulty carbon brush or holder. To remagnetise the magnets you require a powerful two-pole electro magnet, and need to wipe the ends of the poles of the magnets across this, being careful to apply similar poles to each other, otherwise instead of magnetising them you will demagnetise them. Although there is no reason why you should not be successful in remagnetising them in this way, it is a job which requires a certain amount of skill, and we should think it would be more satisfactory to send them to some firm specialising in this work.

**EXPERIENCES WANTED.**

"J.H." (Moffat).—Use of Oildag with lubricating oil.

"G.H.G." (Cambs.).— $2\frac{1}{2}$  h.p. De Luxe T.D.C. with and without sidecar. Reliability and efficiency.

"G.S." (Wensleydale).—Scott combination or Rover. General efficiency, consumption, and tyre wear.

"J.H." (Keighley).—Hobart-Villiers two-stroke, two-speed, with Binks three-jet carburetter. Consumption, easy starting, reliability, acceleration, and power.

"F.J.M." (Castleblayney).—1915 5 h.p. spring frame Bat, 1915 4 h.p. A.J.S., and 1915  $3\frac{1}{2}$  h.p. Sunbeam. Reliability, consumption, and general efficiency.

"J.S." (Leith).—B.S.A.  $4\frac{1}{2}$  h.p. Reliability, general efficiency, speed, and consumption, with and without sidecar. Also Morgan runabout. Reliability, consumption, speed, and general efficiency.

**RECOMMENDED ROUTE.**

TRURO TO NEWBURY.—F.M.

Truro, Ladock, Bodmin, Launceston, Okehampton, Exeter, Honiton, Chard, Wincanton, Amesbury, Andover, Newbury.

**PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.**

In view of the decision of the Government to limit the import of material for the manufacture of paper it is imperative that every possible step should be taken to avoid waste of paper in any form. It has been the custom in the past for newsagents to order a certain number of papers for chance sales, and these copies if unsold become what are known as "returns"; in other words, waste copies.

In the case of "THE MOTOR CYCLE" the percentage of returned unsold copies has been remarkably low, but in order to conserve the supply of paper in future it is desirable that the waste of copies, ordered to accommodate occasional purchasers, shall as far as possible be eliminated.

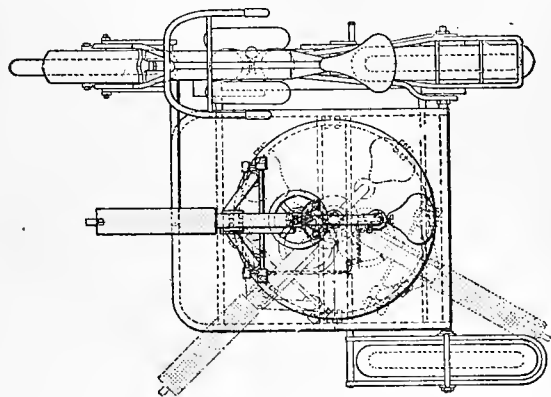
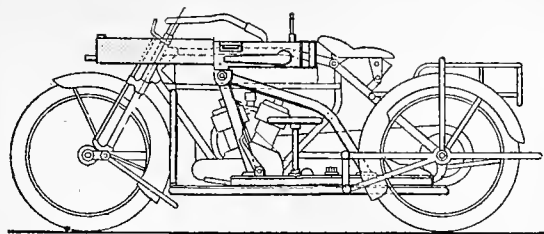
Readers of "THE MOTOR CYCLE" are urgently requested to assist in this matter by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

## Machine Gun Sidecars.

A DESIGN PERMITTING A WIDE RANGE OF FIRE.

THE gun-carrying sidecar outfit is one of the products of the present war, but already much ingenuity has been bestowed upon it, as must be well known to readers of our pages. We herewith describe the patent of Mr. T. H. Tessier, of the Bat Motor Mfg. Co.

The sidecar frame is very much wider than usual, and it carries a number of small rollers arranged in a circle. On these revolves a circular platform which is pivoted upon a central stud. On this stud and beneath the platform is fixed a large gear wheel. The platform carries a short vertical shaft fitted at the top with a hand wheel and at the bottom with a pinion which meshes with the gear wheel. By rotating the hand wheel the pinion revolves on the gear wheel, and the whole platform is rotated. The platform carries the gun tripod and the gunner's seat, which can be revolved through a very large angle. The gear wheel is engaged by a catch which can be withdrawn by depressing either one of a pair of pedals. The gunner can, consequently, after depressing one of the pedals, revolve the whole gun platform by merely rotating the hand wheel to the required extent. Then when the pedals are released the platform is locked. The gun is intended to be fired from the machine.



T. H. Tessier's patent machine gun sidecar outfit.

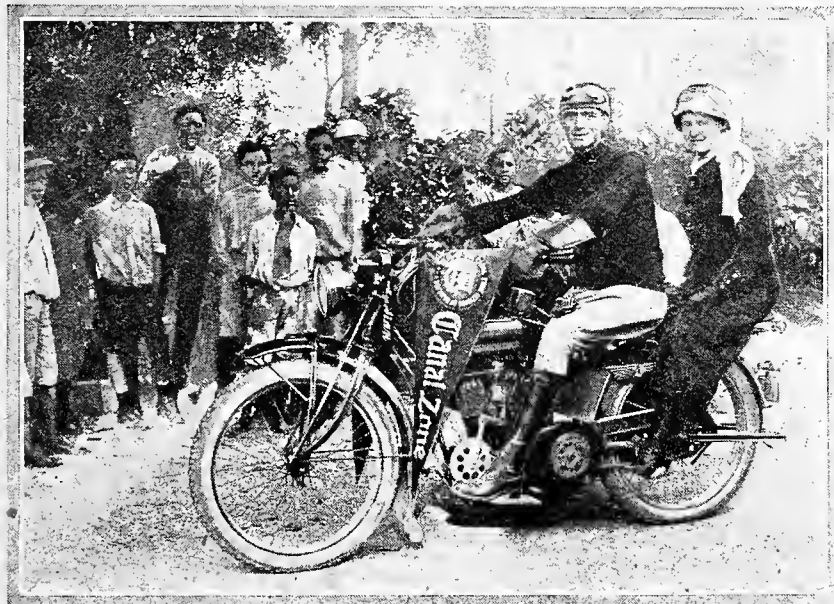
## Motor Cycling in the Panama Canal Zone.

IT would seem, writes a Californian correspondent, that the authorities in the Canal Zone do not look upon motor cycles with much favour, judging by the strict regulations imposed upon them. In the first place the registration fees are very high, being eleven

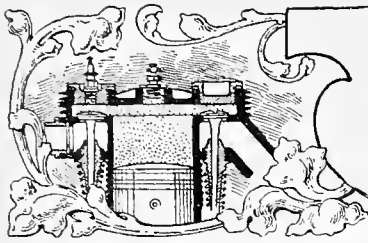
dollars to the Canal Zone and two dollars to the Government of Panama. The speed laws are very rigid, the limit on all roads being eight miles an hour, and the very lowest fine for "hogging" is £6, so the man who likes to "joy ride" might as well take a good brisk walk and let it go at that.

Nevertheless there are a few enthusiasts. Among them is W. M. Taul, a young man connected with the Electrical Division of the Panama Canal Commission at Balboa, who is the owner of an Indian, which he uses in connection with his work. He says that there are only fifty miles of rideable roads in the whole Isthmus, and in some places the roads are so narrow that, when a motor cycle and a car meet, one or the other has to drive into the jungle in order for the other to pass.

One of the principal rides, and a very interesting one, is between the Canal Zone and the Republic of Panama. Besides the old churches and ruins to be seen in the ancient city of Panama there are sports of all kinds, such as bull fights, which bring a large number of people from the Zone in automobiles and cycles.

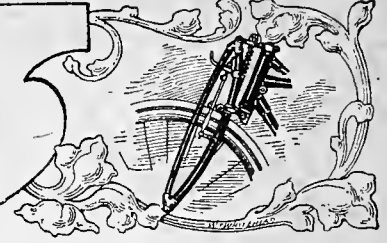


Motoring in the Canal Zone is limited by strict speed limits, lack of good roads, etc., but these drawbacks do not prevent the riders shown from enjoying many spins.



# PATENTS.

Abridged by ERIC W. WALFORD.

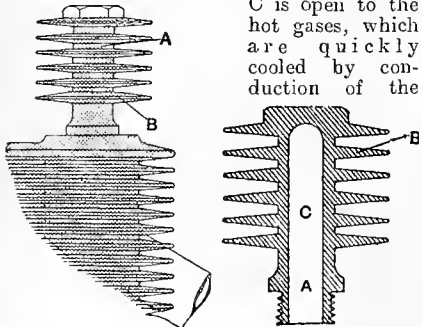


## The Dunhill Sidcar Frame.

The main frame members AB are connected at the rear by the tube C, and at the front are coupled to the front attachment tube D. A member E extends completely round the wheel, so that this is supported on both sides. For the attachment of the rear of the body a frame F is employed, which is pivoted about the tube C. At the front this pivoted frame is connected to the main tubes AB by means of coil springs G, whilst a spring-mounted bearer bar H forms the front body support. The action of the pivoted frame F brings the body load directly over the axis of the wheel, so that a strong construction results.—Dunhills, Ltd., and W. H. Field, No. 4,784, 1915.

## An Auxiliary Cooling Device.

Screwing into or taking the place of a valve cap is a long hollow body A provided with cooling ribs B at right angles to its axis. The central passage C is open to the hot gases, which are quickly cooled by conduction of the

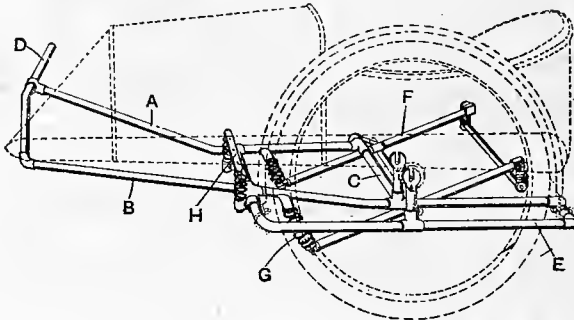


body. The effect of the retention of exhaust gases in the cavity C would, of course, vary with its capacity, and can only be determined by a practical test of the device. The writer's experience would lead him to expect pre-ignition when the engine was hot.—W. Rogers and F. M. Smith, No. 3,239, 1915.

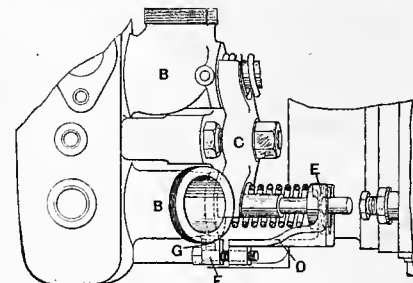
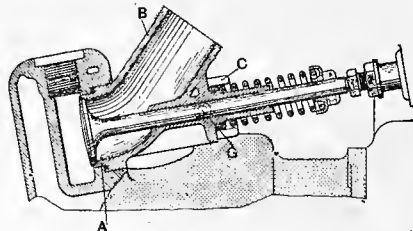
## Easy Valve Removal.

With large engines having horizontal opposed cylinders, removal of the valves is not always an easy matter, owing to the interference of the back mudguard or frame in the case of the back cylinder, and the front mudguard or frame in the case of the front cylinder. To overcome this in the present case, the valve seating is made removable so that it and the valve can be moved in the direction of the camshaft when it is desired to remove the valve, and this,

of course, means that grinding in can be done away from the machine, and if necessary a complete ground-in valve



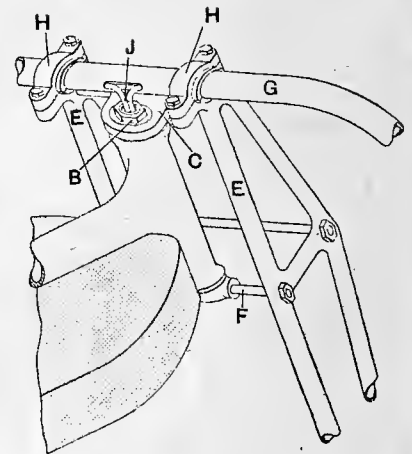
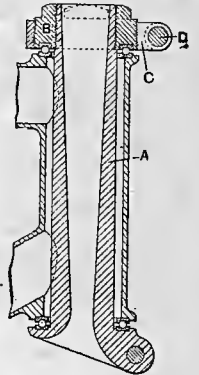
As will be seen from the sectional view the valve seating A with the gas passage B is detachable from the cylinder casting, and the two seatings of each cylinder are held in place by a single dog C. On removing the dog the parts A and B must first be moved to the right to allow them to come away. To facilitate this a special tool is used comprising a kind of hook D, one end



E of which catches under the valve washer, whilst the other end F hooks on to a peg at G, which is formed on the cylinder. To use the tool the engine is turned until the valve is lifted, and the tool put into place. Then the crankshaft is turned so that the tappet drops, leaving a big clearance between the foot of the valve stem and the tappet. The valve and seating can then be moved freely towards the camshaft and lifted away.—Humber, Ltd., and H. Trickett, No. 3,187, 1915.

## A Steering Head Construction.

The steering stem A is carried in bearings as usual, the upper one being adjustable by means of a nut B, which is clamped by means of a split plate C, through which passes a bolt D, the ends of which are secured to the upper ends of the two fork members E. The lower end of the steering stem is also connected with the fork members by the bolt F. The handle-bars G are carried by clamps H on the fork members, and by loosening these clamps the bars can be twisted to provide an adjustment of height. It will be noticed that the handle-bar is slotted at the centre, and that the control wires J pass along the handle-bar, through



this slot, and down the hollow steering stem A, so that they are out of sight for the greater part of the length.—G. E. Bradshaw, No. 90, 1915.

## LOST AND FOUND.

We receive many letters regarding accessories, etc., both "Lost" and "Found," which we are unable to find space for. As these particular matters are of interest to two persons only, viz., the finder and the loser, we keep a list of such articles, and all that are notified to us are inserted in this list. Should we receive a letter from the finder which corresponds to the article lost, the two persons are put into communication, but it must clearly be understood that we cannot enter into correspondence on the matter beyond this.

## MOTOR CYCLES FOR SALE.

## Alldays.

**ALION**, 2-stroke, 2½ h.p., late 1915, almost new, not done 200 miles; owner riding combination; £28, or offer.—Parkstone, Coombe Rd., New Malden, Surrey. [1510]  
**3½ h.p.** 1915 Alldays, 3-speed hub, been 2,300 miles, 32 lead and rear lamps, speedometer, horn, tools complete, excellent running order; £40.—A. B. Cowley, R.A. Mess, Wealdon. (D) [X2756]

## Ariel.

**1914 Ariel**, 3-speed, 2 lamps, tyres excellent, thoroughly overhauled; £31.—Stoner, Aylsham, Norfolk. [1573]

**ARIEL**, 3½ h.p., 3-speed, Sturmer-Archer, 1914, and sidecar, lamps, etc.; £32.—18, King St. East, Rochdale. [X2771]

**1913 Ariel**, 3-speed, 3½ h.p., and sidecar, in perfect order; £35; easy payment arranged.—Jones, Garage, Muswell Hill, N. [1207]

**ARIEL**, 3½ h.p., 1911-12, Gradua gear, free engine, splendid order throughout; £17/10.—Speechley's, 45, Church Rd., Acton. [X2980]

**1916 Ariels**, 5-h.p. and 3½ h.p. combinations actually in stock; ladies taught free by lady tutor; deferred payments arranged.—Ariel Special Agent, Jones, Garage, Muswell Hill, N. [1206]

**2½ h.p. Ariel**, 4-stroke, U.H. waterproof, B. and B. 22 variable spring forks, low and light, excellent condition, and cash for 2-strokes with gears; sell £14.—Hartley, Shorey Cottage, Burnley. [X2820]

**ARIEL**, 3½ h.p. 3-speed combination £32/10, 5-6 h.p. 3-speed combination £35/10, all changes in stock; special deferred payments; liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1369]

## Arno.

**ARNO**, smart combination, 1914, 3½ h.p., 3-speed, cane sidecar, well upholstered, lamp, horn, Sun-spray; 38 gns.—Railway Garage, Staines. [1519]

## Auto-Wheels.

**UTO-WHEEL**, 1916, latest model; £15/15, new.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [1319]

**UTO-WHEEL** and Singer bicycle; cost £24/10; perfect, did 150 miles; £17.—M. O'Brien, 82, Belle Vue Rd., Leeds. [X2892]

**UTO-WHEEL**, late 1914, not run 200 miles, perfect condition, complete with number plates; 7 gns.—Paterson, The Green, Walsend-on-Tyne. [X3069]

**UTO-WHEEL** De Luxe, latest model, £15/15, 26/3 monthly; a standard model, very little used, in splendid running order, £10.—Seen at 248, Bishopsgate, London. [1547]

## Bat.

**BAT** 6-h.p. Twin, in exceptional nice condition; £26.—Percy and Co., 337, Euston Rd., London. [1501]

**5-h.p. Bat-Jap**, 3 speeds, Swan sidecar, splendid condition, accessories; £58.—84, Mall, Swindon. [X3007]

**BAT**, 6-h.p., 1914, 3 speeds, countershaft, coachbuilt sporting sidecar, new condition; £57/10.—82, Case-wick Rd., West Norwood, S.E. [1453]

**BAT**, 1912, single-cyl., grey sporting model, recently overhauled, new bearings, piston, tyres, Rom and Bates; £21/10, or offer.—Owen, Hinton St. Mary, Dorset. (D) [X2988]

**BAT** 8-h.p. Twin, 1914, 3-speed countershaft, kick starter, T.T. model, speedometer, with or without sidecar; £38 and £42.—Percy and Co., 337, Euston Rd., London. [1502]

**BAT**, 1915, brand new, 4-5 h.p. twin, sporting model No. 1, 2-speed countershaft gear, French grey finished; list price £60/7/6; special price for cash £55.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

## Blackburne.

**1915 Blackburne**, 3½ h.p., 3-speed Sturmer hub, excellent condition; £48.—H.N., 278, High Rd., Streatham. [1570]

**BLACKBURNE**, late 1914, T.T., 3 speeds, hand clutch, special finish, sweetest running and prettiest machine on the road, Lucas lamp, spares, etc.; any demonstration; as new; £45.—Hobson, 7, Colthurst Av., Crouch End, N. Phone: 2339 Hornsey. [1296]

## Blumfield.

**BLUMFIELD** 5-h.p. Twin, T.T., 1915, good order.—15, King Edward's Av., Chelmsford. [1469]

## Bradbury.

**BRADBURY**, 4-h.p., free engine, semi-T.T., 1911-1912, complete; £23.—44, West Side, Wandsworth Common. [1405]

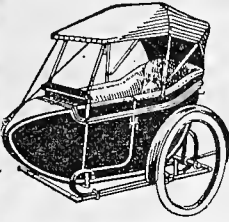
**BRADBURY**, N.S.U. 2 speeds, free, and almost new coachbuilt sidecar, mechanically sound, lamps, horn; 30 gns.—1, Henry St., Bury. [1283]

**BRADBURY**, 4-h.p., 1912½, 3 speeds, free engine, kick start, new Dunlops; £35; exchange Zenith. Matchless, Bat, cash adjustment.—35, Mowbray Rd., Brondesbury. [1477]

**4 h.p. Bradbury**, 1913½, and Singer C.B. sidecar, 2-speed countershaft, kick start, clutch, speedometer, and all accessories; £40, a bargain.—9, Market Parade, Stafford Rd., Wallington. [X2882]

## CORONET Sidecar Chassis

is designed for long life, and has a wonderful reserve of stability, and is safe on greasy roads. Luggage carrier built into frame. Cannot shake loose, and is a boon when touring.



£10 15s.

Send for illustrated catalogue describing these well known Sidecars.

EXCHANGES.

TRADE SUPPLIED.

We can give immediate delivery of all models, and suitable for any make of machine.

## Coronet Sidecars for Harley-Davidsons.

We make a special Sidecar, enamelled French grey to match, 28 x 31 tyre, apron to cover entire body, and 4-point attachment ..... £13 10 Immediate Delivery.

## 7-9 h.p. HARLEY-DAVIDSON.

11J, electrically equipped, 3 speeds ..... £76 13  
 11F, standard 3-speed model ..... £68 5  
 1916 models also in stock.

## NEW 1916 FORDS.

5-seater Touring Car ..... £135  
 Delivery Van ..... £130  
 Motor cycles taken in exchange.

## SPECIAL BARGAINS.

7-9 h.p. HARLEY-DAVIDSON, 3-sp., with coach Sidecar to match ..... £75 0  
 6 h.p. A.J.S., 1915, lamps, horn, speedometer, etc. .... £68 15  
 4½ h.p. STAR, brand new big single, 3-sp. countershaft gear, chain drive, kick starter; listed at £68 5s. .... £55 15  
 3½ h.p. LEA-FRANCIS, 1915, nearly new, 3-speed, kick starter, Hercules £13 13 Sidecar, £5 5 speedometer, £3 10 lamp set; the whole cost £94 10 ..... £85 0  
 2½ h.p. WOLF, 1916, 2-stroke, 2-speed ... £33 10  
 4 h.p. WOLF, 1916, 3-speed, chain drive. £49 11  
 2½ h.p. LEVIS, 1915, 2-stroke, 2-speed ... £25 15  
 1½ h.p. HUMBER, 1914, 3-speed model, with Sidecar ..... £39 15  
 3½ h.p. PRECISION, 1912, nice condition. £16 15  
 1913 HUMBERETTE Cycle Car, hood, screen, electric lamps, 3 speeds and reverse, good tyres ..... £55 0  
 3½ h.p. RUDGE, 1912, free-engine model. £19 15  
 2 h.p. 1915 O.K., 2-speed, nearly new. £23 15  
 3½ h.p. SINGER, 1912, 3-speed model, with cane Sidecar ..... £22 0  
 3½ h.p. SINGER, 1912, 3-speed gear ..... £22 10  
 3 h.p. HUMBER tricar ..... £5 5  
 4 h.p. WOLF, 1912, magneto ..... £9 10  
 4½ h.p. JAMES, 1914, 3-speed, with James coach Sidecar ..... £48 15  
 1909 P. & M., 2-speed, and Sidecar ..... £18 15  
 6½ h.p. DE DION light 2-seater car. .... £15 15  
 1915 MORGAN, 700 x 80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. .... £89 0  
 2 h.p. CALTHORPE Lightweight, 1914, 4-stroke model, countershaft 2-speed, nice order ..... £17 15  
 3½ h.p. PREMIER, 1911, B.S.A. 2-speed. £19 15  
 1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn and lamps ..... £89 15

## MISCELLANEOUS.

New Cane Body, open type; cost 35/- .. 10/6  
 New complete Sidecar Chassis ..... £3 5  
 New Cane Sidecar, enclosed body ..... £7 15  
 Wicker Sidecar Bodies; to clear ..... 3/6  
 New Coach-built Body, side door ..... 57/6  
 Brand New Waterproof Magneto ..... 70/-  
 New 21/- Clare Brass Electric Tail Lamp ..... 4/11  
 1916 Binks Carburettors. Your old carburettor taken in exchange.  
 New Torpedo Cane Sidecar ..... £7 10

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 PORTLAND PLACE, SKIRCOAT ROAD,  
 HALIFAX.

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Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## Bradbury.

**BRADBURY** 1914 6-h.p. Combination, 3-speed countershaft gear, speedometer, lamps, splendid condition; £60, or take lightweight in part; seen after 8 p.m. or Sunday.—Tollfield, 22, Loampit Vale, Lewisham. [X2888]

**BRADBURY** 1914 6-h.p. 3-speed Combination, hood and screen, Lucas accessories, 63 gns.; also 1912 3½ h.p. 2-speed and coach sidecar, £35; liberal exchanges; generous deferred terms.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1572]

## Brough.

**BROUGH**, 1916; orders booked now for early delivery.—W. P. Edwards, Taunton. [X9968]

**BROUGH** 3½ h.p. Twin, for immediate delivery.—Nelson, Gloddaeth St., Llandudno. [X2986]

## Brown.

**BROWN**, 3½ h.p., mag., a sturdy little mount; offered at lowest possible bargain price of £10/10.—Laytons' Garage, Bicester, Oxon. [X3062]

**3½ h.p.** 1909 Brown, Simms, B. and B., dropped frame, 32 spring forks, fine condition, worth £16; give cash and same for 2-speed Levis, or similar.—Walton, Dawson Sq., Burnley. [X2821]

## B.S.A.

**B.S.A.**, 1916.—Both models in stock, or for immediate delivery.—Moss, Wem. [X3003]

**JULIAN'S**, Broad St., Reading. Phone: 1024.—Immediate delivery of all B.S.A. models. [X2834]

**B.S.A.**, 1915, 4½ h.p., done 3,000, good order, new tyres; £45.—Warter, Littlemore Camp, Weymouth. [X2939]

**B.S.A.**, 1913½, 3½ h.p., vanguard gear, free engine, clutch, good order; £35.—Chas. Eddolls, Alresford, Hants. [1347]

**1913 B.S.A.**, 2-speed, in perfect order; £32; guaranteed, easy payment arranged.—Jones, Garage, Muswell Hill, N. [1213]

**B.S.A.**, 1916 models in stock, model H £64; B.S.A. No. 2 sidecar, £18/18.—Hucklebridge, 133, Sloane St., London, S.W. [X2955]

**1916 B.S.A.**, 4½ h.p., model K; £62; delivery from stock; exchanges.—D. J. Shepherd and Co., Enfield Highway, N. [1523]

**B.S.A.**, 3½ h.p., free engine, 2-speed, wicker sidecar, side door, perfect order; £35 cash, bargain.—James, Stow House, Bicester. [X2777]

**B.S.A.**, 1915, 4½ h.p., 3-speed, countershaft gear, chain-cum-belt, complete; £48; no exchanges.—Laytons' Garage, Bicester, Oxon. [X3059]

**B.S.A.**, T.T., 1914, splendid condition, lamp set, spare belt, £28; roomy wicker sidecar, 1915, 24.—Gardner, Hilldrop, Chipping Norton. [X2828]

**1914½ B.S.A.**, all chain drive, 3-speed, etc., general and mechanical condition excellent; price £46; exchanges.—1, Welbeck St., Darlington. [1481]

**B.S.A.** 1914 Combination, 3-speed countershaft, and coachbuilt sidecar, kick starter, in real good order; £55.—Percy and Co., 337, Euston Rd., London. [1493]

**B.S.A.**, late 1913 clutch model, perfect condition, B with lamps, horn, and speedometer; £36; exchanges.—Ideal Cycle Co., Thundersley, Essex. [1533]

**B.S.A.**, 1916, 4½ h.p., model K, just delivered, chain-cum-belt, 3 speeds, kick starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton. [X2998]

**B.S.A.**, 1916, 4½ h.p., countershaft, chain-cum-belt models; we can deliver from stock at £62 cash, or deferred payments.—Laytons' Garage, Bicester, Oxon. [X3060]

**B.S.A.**, 1914, 4-h.p., condition perfect, solo or with coach sidecar, chain drive, 3-speed countershaft gear; £50.—A.B., Tillingbourne Cottage, Shere, Guildford. [1407]

**B.S.A.**, model H and K, actually in stock; special deferred terms; liberal exchanges.—Lamb's, 151, High St., Walthamstow and 50, High Rd., Wood Green. [1367]

**1913 3½ h.p.** 2-speed B.S.A. Motor Cycle, complete with all accessories, in excellent condition; £32, a bargain.—Wooten's Garage, 55, High St., Oxford. [1554]

**B.S.A.**, 1916, model K, Lucas lamp, horn, speedometer, mileage under 300, tyres and enamel unscratched; £60 cash.—Mason, 32, North St., Bishop's Stortford. [1439]

**B.S.A.**, 1916, 4½ h.p., chain-cum-belt, 3-speed, used only twice, and guaranteed as new; cost £62 February 4th, will accept £56.—Tollady, Bicester, Oxfordshire. [X3061]

**B.S.A.**, 1914, 4½ h.p., countershaft, chain drive, complete with speedometer, 3 lamps, coachbuilt Millford sidecar, excellent condition; £50.—27, Elmers End Rd., Anerley, S.E. [1298]

**BARGAIN.** 1912 B.S.A., countershaft 2-speed, free engine, kick starter, and sidecar, new tyres and accessories; any trial; like new; £38, or exchange for Douglas and cash.—45, Bow Common Lane, E. [1449]

**B.S.A.**, 1914, 4½ h.p., countershaft, all chain model, complete with B.S.A. sidecar, excellent outfit, equipment includes sidecar windshield, 2 lamp sets, Junior Long horn, etc.; price £50.—Laytons' Garage, Bicester, Oxon. [X3058]



## MOTOR CYCLES FOR SALE.

## B.S.A.

1916 B.S.A., 3-speed, countershaft, chain-cum-belt, not done 500, Lucas lamps, Stewart horn, under-scratched; cost £65, lowest £55; light car, fast solo wanted.—Lieut. Hufham, 3rd Norfolks, Felixstowe. [1564]

B.S.A. 1916 4½ h.p. Countershaft 3-speed Model K, only done 200 miles, with P.R.S. lamp, mechanical horn, and accessories, and coachbuilt underlugs sidecar; owner enlisted; £59.—Road, 9, Warner Place, Hackney Rd., London. [1511]

B.S.A. late 1913 3½ h.p. Combination, 2-speed, all chain enclosed, countershaft drive, Canelet C.B. sidecar as new, lamps, tools, good tyres all round, Palmer Cord back; any trial; £42, or close offer; exchange higher power and cash.—39, Alexandra Rd., Bedford Park. [1578]

B.S.A.—New 1916 models from stock; inspection cordially invited. All-chain drive £64, chain-cum-belt transmission £62, fitted with B.S.A. countershaft gear, tree engine, and kick start; B.S.A. sidecars to fit, £16; gradual payments entertained; second-hand machines taken in exchange; generous allowance; tuition and free delivery. Buy from B.S.A. appointed agents. Phone: Holborn 5777. When dealing with Wauchop's, purchasers can deal with confidence.—Wanchop's, 9, Shoe Lane, Fleet St., London (just off Ludgate Circus). [X2916]

## Calthorpe.

LATE 1914 Calthorpe Junior, 2 speeds, as new; owner listed; £17.—4, Talbot St., Burnley. [X2845]

1914 Calthorpe Junior, 2 h.p., 2 speeds, good condition; £15.—21, Packington St., Islington. [X2830]

1915 Calthorpe, 2½ h.p., 2-stroke, 2 speeds, new November; £26/10.—175, Castle Rd., Bedford. [1580]

CALTHORPE-J.A.P., 1915, 2½ h.p., splendid condition; £26.—Newham, 223, Hammersmith Rd., W. [1417]

1915 2½ h.p. Calthorpe-Jap, Enfield 2 speeds, Lucas fittings, condition good; 26 gns.—4, Talbot St., Burnley. [X2844]

CALTHORPE-J.A.P., 2½ h.p., new August, 1915, 2-speed, speedometer, horn; £27.—Jones, Rily Camp, Grimsby. [X2726]

CALTHORPE.—Latest 2-speed lightweight models in stock; cash or exchange.—Egles and Co., High St., Acton, W. [X2999]

CALTHORPE-J.A.P., 1915, Enfield 2-speed gear; £25.—Seen, Stag Motor Works, East Finchley, London, N. [1444]

CALTHORPE-J.A.P., 1915, 2-speed, lamps, etc., quite new, owner nervous; £20.—11, Luna Rd., Thornton Heath. [1486]

CALTHORPE 2-stroke, latest model, just arrived; £32/11.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [1305]

CALTHORPE, 2½ h.p., new latest pattern 2-stroke with special magneto; £28/16.—Seen at 248, Bishopsgate, London. [1548]

CALTHORPE, 1915, 2 speeds, 2-stroke, almost new X'all saddle, speedometer; £25.—Percy and Co., 337, Euston Rd., London. [1497]

1915 Calthorpe, 2½ h.p. J.A.P., Enfield 2-speed gear, first-class tyres, Pedley belt; £28/10.—Robinson's Garage, Green St., Cambridge. [6865]

CALTHORPE 2-stroke, 2-speed, quite new, but slightly shop-soiled; special bargain, £28.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [1307]

CALTHORPE-J.A.P., 1916, 2½ h.p., Enfield 2-speed gear, latest model, just arrived; £37/16.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [1304]

CALTHORPE-J.A.P., 2½ h.p., Enfield, 2-speed, quite new, but slightly shop-soiled; special bargain £32/15.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [1306]

1914 Calthorpe Junior, 2-speed, in first-class running order; £16.—Tuke and Bell, Ltd., Motor Department, Carlton Engineering Works, High Rd., Tottenham, N. [19878]

CALTHORPE Motor Cycles, 1916 Models.—Just arrived: 2-stroke 2-speed 31 gns., J.A.P. 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [10777]

1916 Calthorpe-Jap, 2½ h.p., 2-speed, tree engine, latest models, in stock, sloping top tube frame, variable ignition; 36 gns.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [10552]

1915 Calthorpe-Jap, with Enfield 2-speed gear, Miller head light, Stewart speedometer, horn, complete; cost over £40, to be cleared at 26 gns.; very great bargain.—Julian, Broad St., Reading. Phone: 1024. [X2832]

CALTHORPE-J.A.P., 2½ h.p., with Enfield gear, actually in stock, also 1914, with all accessories; £25; special deferred payments; liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1375]

CALTHORPE.—1916 new lightweights from stock, improved design, fitted with J.A.P. engine and Enfield 2-speed gear, £37/16; identically the same machine without 2-speed gear, £32; 2½ h.p. 2-stroke 2-speed model, £32/11; extended payments arranged.—Wanchop's, 9, Shoe Lane, Fleet St., London. [X2915]

# MAUDES

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Telephone -552 Mayfair Telegrams 'Abdicate Wes66

## LIST OF EX-STOCK BARGAINS.

## Exchanges and Easy Payments.

## 1916 MODELS.

ALLDAYS-ALLON, single-speed	£34 0
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INDIAN, 5 h.p., 3 speeds, Model B	£70 0
INDIAN, 7 h.p., 3 speeds, Model C	£78 0
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ENFIELD, 6 h.p., electrical model	£105 0
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1912 Centaur, 3½ h.p., new tyres, just overhauled, Lucas head light; £18.—Bennett, 318, King St., Hammersmith. [X2961]

## Chater-Lea.

8 h.p. Chater-Lea, No. 7, 3-speed, paa seat, coachbuilt sidecar, in splendid condition; £45.—24, Mildenhall Rd., Lower Clapton. [X2722]

CHATER-LEA 8 h.p. Outfit, late 1913, 3 speeds, tyre perfect, lamps, horn, tools, splendid condition; £55, near offer.—Bacher, 156, New King's Rd., Fulham. [1479]

## Chater-Lea-Jap.

CHATER-LEA-J.A.P. Combination, 3½ h.p., Mabon, coil, B. and B., wants overhauling; £12.—Raxworthy, 64, Eden Rd., Walthamstow, Essex. [1294]

CHATER-J.A.P., 1914, 4 h.p., 2-speed combinations, with accessories, ridden 1,000 miles; bargain, £26.—Florist, 123, Askew Rd., Shepherd's Bush. [1517]

4 h.p. Chater-Jap and Mills-Fulford cane sidecar, fitted with 2-speed. Fittall gear, good condition; £35.—Davies, Little Berkhampstead, near Hertford. [1331]

## Chater-Peugeot.

3 h.p. Motor Cycle, Chater-Lea frame, Peugeot engine, B. and B., battery ignition, good tyres, lin. belt, perfect; £26.—Stanbury, Berry St., Liverpool. [X3010]

## Clyno.

CLYNO 2-stroke, absolutely perfect; £23, complete.—Colmore Depot, 31, Colmore Row, Birmingham. [X2786]

LATE 1913 Clyno, 5-6 h.p., 3-speed, clutch, enclosed chain drive, interchangeable wheels, coachbuilt sidecar, accessories; £50.—Wood, 23, Matfield Rd., Snydenham. [1258]

## Connaught.

1914 Connaught, 2-stroke, 2-speed, practically new, not run more than 2,000 miles; £25.—Storer, Aylsham, Norfolk. [1574]

CONNAUGHTS in Stock for immediate delivery; Mixture and 2-speed models.—P. J. Evans, John Bright St., Birmingham. [1473]

CONNAUGHT, 1915, 2½ h.p., standard model, not run 500 miles; cost £36/17, accept £26; exchanges.—Ideal Cycle Co., Thundersley, Essex. [1536]

## Coventry Eagle.

COVENTRY Eagle.—All models from £36/15 to £92/8; earliest deliveries. All motor cycles bought from us have their tanks filled, on delivery, without extra charge.—Meers, Green Taxis, Villiers St. Garage, Charing Cross, London. [19240]

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DAYTON, 1915 (khaki model), 2-stroke, 2-speed, as new; £23.—Frankis, 44, Balls Pond Rd., Dalston, N. [1509]

## De Dion.

2½ h.p. De Dion, Simms mag., B. and B., h.b.c., excellent condition; £7/10.—37, Carlton Rd., Small Heath, Birmingham. [X3068]

## Douglas.

DOUGLAS, 2½ h.p., V, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½ h.p., U, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½ h.p., X, ladies', kick start, in stock; £56/14.

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DOUGLAS Agents and Specialists. Latest models at rock-bottom prices. Lists on application. T.A.: Bicycles. Tel.: 388.—Robinson's Garage, Greu St., Cambridge. [6864]

DOUGLAS, 1916; immediate or early delivery; any model.—W. P. Edwards, Taunton. [X9965]

2½ h.p. 1913 (late) Douglas, 2-speed, good order.—E. J. MacLaughlin, Diagle, Kerry. [X2725]

MODEL V 2-speed New Douglas Machines from stock; £50/8.—Wanchop's, 9, Shoe Lane, London. [X2920]

DOUGLAS, 1915½, 4 h.p., 3-speed, kick starter, lamps, horn, etc.; £56.—Garnet Williams, Hay, Hereford. [1268]

DOUGLAS, 1910, in good running order, just overhauled; bargain, £13/10.—Hoare, Burbage, Wilt. [1411]

1913½ Douglas, model R, well kept, magnificent machine; £33.—Bemister, Knaphill, Woking. [1480]

DOUGLAS, 1914, 2½ h.p., 2-speed, splendid condition, all accessories; £36.—140, Brighton Rd., Surbiton. [1405]

1910 Douglas, in good running order, guaranteed, 1 snap, £13/13.—Jones, Garage, Muswell Hill, N. [1212]

1914 Douglas, 2½ h.p., model U, Amac, Bosch, complete lamps, etc.; £36.—Cross, Jeweller, Rotherham. [X2967]

DOUGLAS, 1914, speeds, all accessories, new condition; £34/10.—Walton Lodge, Surbiton Rd., Kingston. [1456]

## MOTOR CYCLES FOR SALE.

## Henderson.

HENDERSON, 4-cyl., 2-speed, model E, absolutely new; 78 gns.—Taylor's Garage, Penzance. [X2118]

HENDERSON, 8-10 h.p., for immediate delivery; £86/10; the best motor cycle ever produced; exchanges entertained.—The Premier Motor Co., Birmingham. [1586]

10 h.p. Henderson 1914 Combination, 4-cyl. engine, 2-speed gear, and free engine, fitted with coachbuilt sidecar; £55 the complete turnout, with all accessories.—Wauchope's, 9, Shoe Lane, London. [X2941]

HENDERSON, 1916, model E, 4-cyl., nearly new, 2-speed gear, clutch, lamp, horn, etc.; cost over £90; perfect condition; sacrifice £72/10; good reason for selling.—Kelly, 1, The Close, Walton Park, Liverpool. [1334]

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HOBART, 1915, brand new, 2½ h.p., 2-stroke, 2 speed; 1st price £36/15, reduced to £30 for cash only; full guarantee.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

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HUMBER Lightweight, new condition, all accessories; £18-35, Arragon Rd., Twickenham. [1286]

HUMBER, 2hp., late model, little beauty; £16; owner in Flying Corps.—Mylam, London Rd., Thornton Heath. [X2831]

1913 3½ h.p. 2-speed Humber, in first-class condition, fitted with all accessories; only £26.—Wooten's Garage, 55, High St., Oxford. [1557]

HUMBER, 1911, 3½ h.p., 2-speed, good condition throughout, lamp, horn; lowest possible bargain price £16/10.—Laytons' Garage, Bicester, Oxon. [X3063]

HUMBER Twin, 2½ h.p., 1913, just been re-bushed, re-enamelled, etc., guaranteed first-class condition; £20.—Firth, 27, Woodbridge Rd., Moseley, Birmingham. [X3103]

3½ h.p. 1912½ Humber, 2-speed, £14 Canoelet sidecar, 3 Lucas lamps, Brooks best saddle, speedometer, spares, excellent condition, ridden only by owner; what offers?—Kinsey, Solicitor, Crewe. [1325]

## Indian.

JULIAN'S, Broad St., Reading. Phone: 1024.—Immediate delivery of all Indian models. [X2836]

INDIANS, 1916: immediate delivery, all models, these fine machines.—W. P. Edwards, Taunton. [X9966]

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1915 Indian, 7-9 h.p., clutch model, very fast, in splendid condition; £50.—Brook, Motors, Burnham, Som. [X8930]

7 h.p. T.T. Indian, 2 speeds, good condition, suit officer, fast and reliable; £39-4, Talbot St., Bursley. [X2843]

NEW 1916 Power Plus Indian, 7 h.p., 3-speed; bargain, £70; don't miss this.—Box 12, c/o The Motor Cycle. [X1059]

7 h.p. Indian, fitted with De Luxe sidecar, coachbuilt, 2-speed gear model; £55; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X2913]

INDIAN, C, 7-9 h.p., 1915½, 3-speed combination, complete equipment, as new; £80.—Portington, 12a, St. Leonard's Rd., Bexhill. [X3072]

INDIAN 7-9 h.p. Combination, electric lighting, condition as new.—Apply, Brookfield Garage, Swains Lane, Highgate Rd., N.W. [1382]

1911 Indian Combination, grand order, fast and reliable; great bargain, £22; giving away price.—Hall, 21, Rupert St., Bolton. [X3021]

INDIAN 1915 Combination, 3 speeds, kick starter, almost new, run 1,400 miles, speedometer; £60.—Percy and Co., 337, Euston Rd., London. [1496]

1916 7 h.p. Model C Indian Combination, electric lighting, ridden 5 miles; cost £101, accept £91; owner called up.—Box 113, c/o The Motor Cycle. [X2842]

INDIAN, 1915, 3½ h.p. twin, T.T. bars, 3-speed, clutch, and kick-starter, condition as new, lamp set, rear light, and horn complete, guaranteed; £45.—Below. [10597]

INDIAN, 1915, 5 h.p., 3 speeds and clutch, T.T. bars, Model de Luxe sidecar, splendid order; £62.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0597]

INDIAN, 7-9 h.p., 1915, road racer, clutch model, brand new, and guaranteed perfect; new price £65, absolute gift, £56/10.—Forde and Browne, Berry St., Liverpool. [1335]

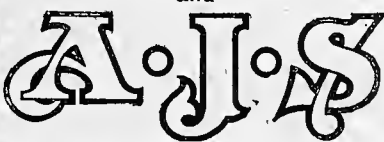
INDIAN, 1912, 7 h.p., 2-speed, very dirty inside and out, good mechanical condition, full equipment; £25, or near offer; appointment by letter only.—81, Crouch Hill, N. [1533]

INDIAN, blue, 1914, 2-speed, 16 gn. Bramble sidecar, P and H, F.R.S. head lamps; trial; must sell; owner enlisting; £46-22, Royal Oak Rd., Bexley Heath, near Woolwich, Kent. [X2773]

INDIAN, 7-9 h.p., Sept. 1913, 2-speed, coachbuilt sidecar, 3 lamps, speedometer, thorough order, good tyres, lot in good condition; £48/10.—Forrest, 22, Scmers Rd., Walthamstow. [1348]



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1914 6 h.p. A.J.S. Com., hood and screen	£75 0	£25 0	89/7
1913 7 h.p. INDIAN and Sidecar	£50 0	£15 0	62/8
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INDIAN, 5 h.p. 3-speed £70, model F 7-9 h.p. 3-speed electric £90, model G 7-9 h.p. £75; several makes sidecars to suit.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1370]

1914½ Indian and 16 gn. Gloria sidecar, 7-9 h.p., 2-speed, kick starter, clutch, electric equipment, 4,000 miles, speedometer, large quantity spares; £55; guaranteed perfect.—Hamphrey, Baker, Romford. [1255]

INDIANS in Stock for immediate delivery; models B, C, D, E, and F, also sidecars; early delivery of the 2-stroke.—P. J. Evans, Controlling Birmingham and Midland Agent, 87-91, John Bright St., Birmingham. [1471]

INDIAN, 1913½, looks like new, 7-9 h.p., with speedometer, lamp, tools, spares, etc., also including lovely coachbuilt sidecar, with hood and screen; will accept £56, or near offer.—Apply, Chas. H. Mayo, Ivydene, Queen's Rd., Hershaw, Walton-on-Thames. [1345]

INDIAN, 1915, model C, and Fitsu sidecar, done 2,000, muffs, switchboard, hind, mudshields, sidecar mudguard fixed to body, screen, mats, grid, and head lamp; cost £100 in July, £80, or near offer.—G. Warren, 40, Highburgh Drive, Burnside, Glasgow. [1591]

INDIAN Model D Road Racer, 7-9 h.p., mechanical horn, lamps, speedometer, and other spares, run under 1,000 miles, new July last, £52/10; also model D, without accessories mentioned above, scarcely used, £50—both splendid bargains.—Apply, Mitchell's Garage, Saxmudham. [1478]

INDIAN Combination, 1915, 7 h.p., 3-speed, spring frame, F.R.S. lamps, Lucas horn, mirror, special sidecar accommodation for child, fitted wind screen, hood, locker at back, mileage 1,000, equal to new; price £75; seen Saturdays, or by appointment.—Fearley, 57, Chestnut Rd., Raynes Park. [1519]

## Ivy

1915 2½ h.p. Ivy 2-stroke De Luxe Motor Cycle, in very good condition; £28.—Wooten's Garage, 55, High St., Oxford. [1556]

## James.

1913 4½ h.p. James and Canoelet Sidecar, 3-speed; £40, or exchange Douglas.—Cross, Ebbingham Sq., Rotheham. [X2968]

JAMES Combination, 4½ h.p., 3-speed countershaft, and accessories; £45.—Colmore Depot, 31, Colmore Row, Birmingham. [X2788]

JAMES 4 h.p. Combination, Canoelet sidecar, lamp, horn, speedometer, all like new; £50, a rare bargain.—Buntins, Harrow. [1466]

JAMES, late 1915, 2-stroke, 2-speed, lamp, horn, tools, complete, splendid order, very little used; £35, offers.—Kindley, 7, Gleacalla Rd., Llanelli. [X2871]

JAMES, 2½ h.p., 2-speed, 1916 model, perfect condition, improved mudguards, Lucas horn, and electric light; price £53.—Woodward, 21, Walsway Rd., Salford. [X2931]

JAMES 1914-15 Combination, winner 6 gold medals, 2 cups, Lucas, leg-shields, 3-speed, kick starter, luggage carrier, perfect order; nearest £52.—Morris, Auctioneer, Bournemouth. [X2879]

1916 Model James Big Single, 3-speed, with sidecar, special reason for sale; 65 gns.; not done 100 miles; sidecar unused.—Doctor Vickers, Cheriton Fitzpatrick, Crediton, Devon. [X2829]

4½ h.p. 1915, run 2 months, 1,500 miles, usual accessories, James sidecar silencer, new condition; 63 gns.—Spurgeon, Rozel, Broadwater, Worthing. [X5071]

BARGAIN of Season.—James 4½ h.p. combination, Aug. 1914, 3-speed gear box, chain drive, clutch, kick starter, speedometer, powerful head and tail lamps, horn, special silencer under sidecar, wind screen, mat, apron, and accessories; £52/10, no offers, or exchange twin combination.—11, King's Rd., Doncaster. [X2876]

1915 4½ h.p. James Combination, competition model, semi T.T. bars, 65 mm. tyres, Lucas horn and head lamp, Low generator, Watford speedometer, Pillion seat, h.b.c. clutch, wind screen, storm apron, and dis-wheel, new black tyre and chain, done 4,000; £65, or offer, cost £94 last July.—Hudson, 32, St. Stephen's Rd., Bow, E. [1515]

## J.A.P.

J.A.P., 4 h.p., 1915, 3-speed Sturmer, Montgomery sidecar, extra good condition; £42.—Seen, Stag Motor Works, East Finchley, London, N. [1445]

1914 6 h.p. J.A.P. Twin, 2-speed, free engine, mag., new belt, Bramble coachbuilt sidecar; £38.—Apply after 6, E. Chitty, 133, Sandhurst Rd., Catterd. [1328]

J.A.P. Twin, 3-speed, kick start, and Bramble coach sidecar, lamps, horn, enamelling, plating like new sacrifice £38.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [19897]

J.A.P., 8 h.p., 2-speed, coachbuilt sidecar, all accessories, one of finest J.A.P.'s on road, and in new condition, T.T. and touring bars; £50, or see Exchange column.—Bartlett, St. James Rd., Kingston-on-Thames. Phone: 1701. [1412]

## J.E.S.

J.E.S. 3-speed Gamage de Luxe Cycle, perfect; approval; £12.—Curd, 17, Gardner St., Brighton. [1489]

J.E.S. Lightweight, 1½ h.p., new 1916 model, soiled only, motor and pedal combined; £20; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X2919]

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**JUNO**, new 2½ h.p. Villiers 2-stroke, semi-automatic lubrication, and all latest improvements; £29/10, 41/8 months.—See below.

**JUNO**, new 2½ h.p. Villiers 2-stroke, Albion countershaft, 2-speed; £36, 51/- month.—See below.

**JUNO**, Villiers 2½ h.p. 2-stroke, only used a month, 2-speed countershaft gear and hand-controlled clutch, fitted with Stewart speedometer; £28.—See below.

**JUNO-J.A.P.**, 6h.p., Sturmer-Archer combination gear, semi-automatic lubrication, heavy 2½ in. Dunlops, Druid forks, aluminium footboards; £75/12.—See catalogue for full particulars, 180 pages, 1,000 illustrations, post free.—Metropolitan Machineists' Co., Ltd., 248, Bishopsgate, London.

## King Dick.

**KING DICK**, 3½ h.p., 2-speed, Coronet sidecar, Palmers; £24, or nearest.—See at 162, Acre Lane, Brixton, S.W. [X351]

## Levis.

**LEVIS**, only run 500 miles; £27.—89, Wellington Rd., North, Stockport. [X2229]

**LEVIS**, 1916; early delivery these fine 2-strokes.—W. P. Edwards, Taunton. [X9967]

**LEVIS**, 1916.—Both models in stock; no waiting; order now.—Moss, Wem. [X3041]

**1916 Model E** and Popular Levises actually in stock.—Wilkin, Hunter's Bar, Sheffield. [1527]

**JULIAN'S**, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all Levis models. [X2837]

**LEVIS Popular Model**, 2½ h.p., late 1915, slightly shop-soiled only; £26/10.—Shipley, Wickford, Essex. [1359]

**LEVIS Popular**, or new model **E**: immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0764]

**1916 Levis Popular Model**; £32: delivery from stock; exchanges.—D. J. Shepherd and Co., Enfield Highway, N. [1322]

**LEVIS Popular Model**, new; immediate delivery; £28/1.—Wilkins, Simpson, and Co., 11, Hammer-smith Rd., London. [1310]

**1915 Levis Popular**, with footboards, absolutely indistinguishable from new; 25 gns.—Julian, Broad St., Reading. 'Phone: 1024. [X3023]

**LEVIS**, 1914, 2½ h.p., footboards, sight feed lubrication, mag. control, fully equipped; offers over £21.—Box L381, c/o The Motor Cycle. [8497]

**LEVIS Popular**, 1915, semi-T.T. bars, fine condition throughout, fully equipped; first cheque £20 secures.—Box L790, c/o The Motor Cycle. [1583]

**LEVIS 2-stroke Motor Cycles**, latest 1916 models.—Sole London and district agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. 'Phone: 1432 Regent. [0711]

**LEVIS**, 1914, 2½ h.p., 2-speed countershaft, front and rear lamps, Lucas horn, Stewart speedometer, spares, tools, guaranteed perfect condition; £32.—Horricks, Strathmore, Seymour Rd., Bolton. [1326]

**2½ h.p. 1916 New Levis Motor Cycle**, chain drive, and 2 Enfield 2-speed gear, £47/10; 2½ h.p. Popular Levis, single-speeds, £32; delivery from stock; easy terms or exchange.—Wauchope's, 9, Shoe Lane, London. [X2924]

**LEVIS Popular**, 1916 models. We can deliver promptly at £32 cash, or by deferred payments; we have also in stock the standard Popular model at £28/1.—Oxfordshire Agents, Laytons' Garage, Bicester, Oxon. [X3056]

**LEVIS**, 1916, Popular models, £32; No. 1's, with Enfield gear, Roman rims, £47/10; special deferred payments; exchanges; a few 1915's going at old prices.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1374]

## Liberty.

**2 h.p. Liberty**, open frame, re-bushed, new piston, Hellesen, 1914 B.B.; £5.—67, Ebrington St., Plymouth. [X3109]

## Lincoln-Elk.

**4½ h.p. Lincoln-Elk Combination**, late 1913-14, chain-drive, 2-speed, kick starter, light torpedo sidecar, all accessories, lamps, tools, cover, etc., just thoroughly overhauled and refitted, tyres new, splendid condition; bargain; owner naval officer ordered foreign service; must sell; £32; any trial; can be seen at Fife Motor Co., Dunfermline, Fife, or write Lieutenant Commander Scott, H.M.S. Contest, c/o G.P.O., London. [1276]

## London.

**3½ h.p. London**, m.o.v., good order, pulls sidecar.—22 Bell, 19, Washington St., Worthington. [X2929]

## L.M.C.

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## Martin.

**MARTIN-J.A.P.**, latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.C. Tel.: Regent 1432. [0760]

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**MINERVA**, 3½ h.p., excellent condition, accessories; seen running; £38/10.—29, Wymond St., Putney. [1475]

**2½ h.p. Minerva**, modernised, 1914 mag., B. and B.; ride 50 miles to purchaser.—12, Asylum Rd., Peckham, London. [1435]

**MINERVA**, 3½ h.p., m.o.v., cylinder and piston; Thursday or Saturday, after 7 o'clock.—25, Northampton Rd., Croydon. [1395]

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**MINERVA** Twin Combination (wicker), chains, countershaft, clutch, kick starter, battery ignition; sell £16, or exchange single solo.—5, Harold Rd., Birmingham. [X2719]

**3½ h.p. Minerva**, low, mechanically-operated valves, B. and B. carburettor, mag., with passenger cushion; £12.—Seen and tried, P. 602, King's Rd., Fulham, S.W. [1404]

## Motosacoche.

**MOTOSACOCHE**, 2 h.p., good running order, mag., tyres good; £10.—Godwin Bros., Woking. [X3039]

**2 h.p. Motosacoche**, requires mudguards and belt, otherwise good order, mag., Druids; £6.—Siddall, Avenue Halcyn, Hesse. [X2976]

**MOTOSACOCHE**, good running condition, mag.; first cheque 28 secures. W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1007]

**MOTOSACOCHE**, late 1914, 3½ h.p. twin M.A.G. engine, 2 speeds, chain drive, unscratched; £40.—Spence, Kinglassie, Fifehire. [X2839]

**MOTOSACOCHE**, 3½ h.p., 1915, as new, £45; also late 1913 3½ h.p. Motosacoche, in first-class order; £27; owner using 6 h.p. combination.—Dr. Jackson, Corbridge on Tyne. [1484]

## New Hudson.

**NEW Hudson**, 2½ h.p., 3-speed, clutch, as new, all accessories; bargain, £30.—Mitchell's Garage, Carshalton. [1600]

**1914 New Hudson**, 2-stroke, 2-speed, excellent condition; £28.—District Rubber Co., Acton (adjoining Underground). [1485]

**1914 New Hudson**, 4 h.p. J.A.P., and sidecar, 3-speed, free engine, lamps, spares, tools; £43.—Newitt, Vange, Pitsea, Essex. [X3106]

**NEW Hudson Combination**, 1912, 3½ h.p., 3-speed gear, in good condition; £38, or near offer.—Thompson, 16, Victoria Terrace, Hove, Sussex. [X3102]

MARCH 2ND, 1916.

# THE MOTORCYCLE

ESTABLISHED IN 1903

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Telegrams: "Motorcycle, Coventry."  
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Subscription Rates: Home, 6s. 6d.; all countries abroad, 10s. 10d. per annum.

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## Increased Exports and Reduced Imports.

**W**HENEVER the financial position is discussed by Cabinet Ministers it is usual to emphasise the desirability of increased exports and reduced imports.

And that is where the matter ends! Yet it is glaringly obvious that to maintain our balance of trade during war time whilst practically the whole of our productive resources are engaged on munitions of war is impossible. But if our leaders are so convinced of the desirability of increased exports and reduced imports, then we can only remark that after eighteen months of war it is high time that they discarded advice and commenced action. The Prime Minister lately asserted that "it is only by the maintenance at the highest possible level of our productive activities and of our export trade and by the curtailment of imports that we can possibly sustain the unexampled burden which has been cast upon our shoulders."

The subject of British motor cycle exports is one we have laboured for months past, and from time to time we have urged certain obvious business plans which suggested themselves as desirable in the present crisis. What has been done by the Government to assist manufacturers in exporting the goods they have produced? Obstacles in the way of British manufacturers supporting the Government's exhortations to increase exports have been mentioned constantly, but from outward indications it is plain that nothing whatever has been done to remove these obstacles. Indeed, the position has become worse. The shipping question has always been a difficulty, and the railway companies now frequently refuse to transport goods to the coast. To turn for a moment from exports to imports. It is generally agreed that Britain is second to none in the production of motor cycles, yet we see constantly batches of motor cycles being ordered by our Allies from neutral countries when England could well maintain the supply.

France and Russia would, we have no doubt, place their orders in this country were the position made clear to them, as it ought to be, whilst there seems to be no excuse whatever for the South African Government placing an order for American-made machines while supplies are available in this country. Those in the know are inclined to smile at the good advice of Cabinet Ministers, upon which they themselves, however, do not act.

When it is remembered that during the eighteen months that this idle talk has been proceeding we and our Allies have imported several million pounds worth of foreign-made motor cars and motor cycles for military requirements which our own workshops were capable of producing, surely it is time to call for deeds, not words.

## Unfit for Service.

**N**OTHING has puzzled us more in connection with recruiting than the number of men who have been rejected on account of some slight physical defect.

Apparently it has been the rule that recruits who were not perfect specimens of manhood were useless to the country in this war. Just why such a drastic rule should have been introduced and adhered to throughout is one of those questions which no business man can answer. An adjutant once told us that he was regularly having to discharge twenty recruits per week on account of hammer toes. These men were sent home, apparently good-for-nothings, and not directed to other channels where their services might be of considerable assistance to the Government. One of many such cases which have come to our knowledge is of a tester employed by a leading motor cycle manufacturer, who first enlisted in a line regiment and was discharged, and after returning to his old firm could not rest, but again managed to enlist in another section, again only to be discharged after a month's service. His original



employer was only too glad to have him back, and he has since been in regular employment, and has never suffered a day's illness. This man is a healthy motor cycle tester, used to constant exposure in all weathers, and the harsh ruling previously referred to has deprived the Government of his services for something like fifteen months. And this is not an isolated case. We contend that such men are of great value to the Govern-

which unaccountably enough have been considered sufficient to render a man useless for military service. No doubt when the organisation of our Army is perfected this sort of thing will not continue, and the

UP IN THE AIR ON A MOTOR CYCLE.



Triumph testers "buck jumping" on road and grass whilst trying to break War Office machines. The lower picture shows a donkey-back bridge. No doubt many readers have experienced the sensation of leaving the ground when crossing such bridges at speed. Ballig Bridge, on the T.T. course, was such another, and spectators are usually thick at this point.

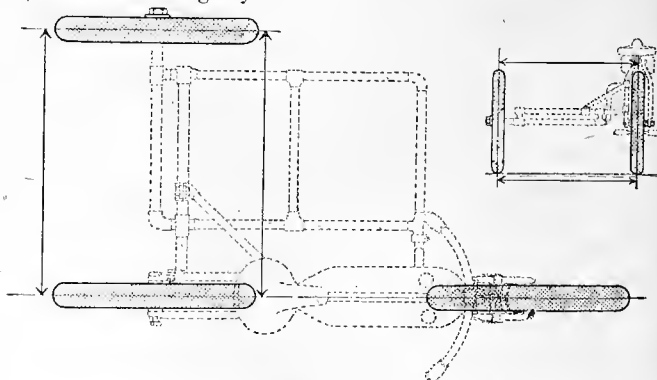
ment if only to release for active service many able-bodied men who are at present employed on clerical work in military establishments or other sedentary occupations, and there are thousands of them. Even men who have joined the most highly paid sections, and who have been examined as motor drivers, have finally found their way into offices when they could quite well have been replaced by men with short sight, weak hearts, hammer toes, and the other slight defects

sooner every man unfit for active service is gathered into the ranks of those to be employed in the less strenuous occupations, to which we have referred, in order to release able-bodied men for foreign service, the sooner will people recognise that our house is at last being put in order. As it is, men holding responsible positions, and whose work is directly for the good of their country, are being taken to fill up the gaps.

## The Alignment of the Sidecar.

THE correct alignment of the sidecar wheel with those of the bicycle is most important, but this fact is not generally appreciated, judging by the number of incorrectly fitted sidecars to be seen on the road. If the wheels are running out of line with each other, not only is the steering adversely affected, but the wear on the tyres is considerably increased. One of the best methods of ascertaining whether the wheels are parallel is to measure the distance between the centres of the treads (with the aid of string or a lath) in the positions shown in the diagrams; if these measurements correspond, the sidecar and driving wheels will be in correct alignment. Many riders maintain that the steering is rendered easier and more comfortable by having the front of the sidecar wheel pointing very slightly inwards, especially in those cases where the sidecar wheel is fitted, as it generally is, a little in advance

of the rear wheel of the bicycle, as the tendency of the former wheel seems to be for it to be splayed outwards slightly.



How to check the alignment of sidecar and bicycle wheels.



### Petrol Prices.

The present position appears to be that the Shell Co. are genuinely short of supplies (they assure us that they provide much more than any other company of the Government's requirements); at any rate, my last order for Shell was only accepted subject to a 50% reduction in the quantity, and still remains unfulfilled. The other companies apparently have larger supplies, and have put up their prices to prevent their stock being exhausted too rapidly. A Portsmouth reader suggests that private owners should subscribe to form a co-operative petrol supply association. He is clearly unaware of the existence of such a society, which provides its shareholders with excellent Roumanian petrol at prices below those charged by the ordinary companies. Its offices are situated at 3, Copthall Buildings, Copthall Avenue, E.C., but I understand that its motor lorries were commandeered at the outbreak of war and that it is still unable to fulfil orders very promptly. Its terms to shareholders are usually about 2d. per gallon below the standard rate, and I can vouch for the quality of its spirit (the Diamond brand) when, and where, obtainable.

### The "White China Knob Test."

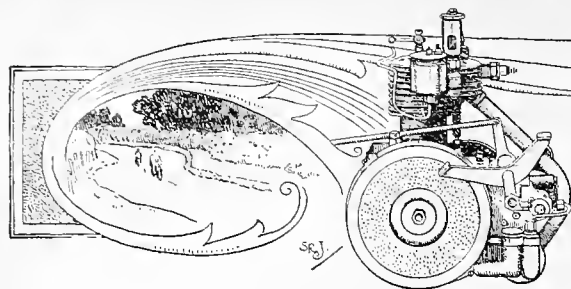
Many years ago *The Motor Cycle* published a farcical serial in the silly season, wherein a novice was taught to lay his finger on the sparking plug to trace the presence or absence of current when his engine would not fire, and the test was christened as above. It is really a most useful tip, though I seldom employ it, as I have a constitutional dislike to electric shocks, however mild. However, I was so thoroughly baffled by the behaviour of one of my engines that I tried the dodge last week. The circumstances were as follow. Nine times out of ten the machine would start with consummate ease and run beautifully; but every now and then it would refuse to start at any price. The misconduct occurred indifferently, whether the engine was hot or cold, which suggested that carburation was not the culprit; and if I had sufficient energy to keep on pushing it generally went off at last. However, an evil hour came when I had to call at a house halfway down a 1 in 6 grade; the machine refused to restart up the hill, so I pointed its nose down for gravity to tackle the job. I coasted half a mile with the engine burbling over merrily on bottom gear, but never an explosion. I was in a hurry by this time, so I clenched my teeth, leant down, and pressed a timid finger on the plug. No shock! Off came the contact breaker cover, and the platina were found to be permanently open. Since I freed the bell crank spindle in its bush, starting has been uniformly perfect. I have often encountered cases of the bell crank sticking permanently, but never before have I met one which sometimes stuck and sometimes worked.

### Combined Drive for the Baby Two-stroke.

I have written many parasangs of copy in favour of the belt-cum-chain drive, and still believe there would be no other drive on the market if it were not for those interfering sidecars. If they succeed in substituting the two-chain drive on the higher powered machines as, to my poignant sorrow, they threaten to do, I will yet maintain with my dying breath, if necessary, that the combined drive is absolutely "It" for baby two-strokes. Somebody asked me the other day how often I shortened the belt of my two-stroke. I have had it six months and no knife has yet touched it. Musing on these facts, I happened to strike a dear little baby watersplash about ten feet wide and six inches deep in the middle. Not being in any hurry, I resolved to drive backwards and forwards through the water until the belt spoilt its record and slipped. Much to the mystification of one or two shepherds and keepers on the surrounding moor, I drove backwards and forwards through the splash for a quarter of an hour or so without succeeding in getting a race from the engine. Then the unkind treatment got in its deadly work on the ignition, and, after an eloquent five minutes with that extremely Yankee production, I departed a wetter, but not a wiser man.

### Petroilists, Strain Your Oil.

I had been off "petroiling" for a long period, and rather regret that I have returned to it. The immediate accompaniment was a bad fit of chronic flooding. I examined and cleaned the float needle, only to see the hideous green and yellow stains over half the machine next day; and finally, in something of a pet, I discarded the faulty carburetter, and slung on another which chanced to fit. It ran nicely for two days, and then the stains returned. I decided that the Government must have commandeered all the supply of float needle metal (to caricature our manufacturers' stock war time excuse for defective parts), and on went carburetter No. 3, which also started flooding within forty-eight hours. I began to see daylight, and, seizing my drum of costly lubricant, strained a quart or so through very fine wire mesh. As I thought! The lubricant was full of foreign matter, ranging from hair and fluff to bits of metal filing, and it was these which had wrecked the reputation of three first-class float needles. Gentlemen, the Government have evidently commandeered the supply of oil-straining wire gauze; so haste to your wife's treasure chests, and commandeer her best cambric handkerchiefs unless you wish unstrained oil to spoil the operation of your costly carburetters! In the meantime, my profound apologies to Messrs. Senspray, Brown and Barlow, and Charles Binks, all of whom I would ere now have excommunicated with bell, book, and candle had I been a bishop instead of merely a miserable motor cycling journalist.



## A Plea for the Steerable Sidecar Wheel.

By DOUGLAS LEECHMAN.

**T**HE precise position which a sidecar wheel should occupy relatively to the driving wheel of the bicycle is one which has come up for discussion many times since the sidecar first became a practical factor in motor cycling.

Regarding the combination simply as a front steering, rear driving vehicle, one would say that the side wheel should be co-axial with the driving wheel, so that the two rear wheels may run parallel to one another when proceeding straight ahead and may turn about a common centre when the machine, as a whole, is describing a curve. This is in accord with the well-known theory that all the axes of the wheels of the vehicle should intersect at one point, viz., the centre of the curve which the vehicle is describing.

Starting with the "co-axiality" of the side and driving wheels as a basis, therefore, the next thing to consider is how far the general theory is affected by the special conditions of the case.

### The Position of the Sidecar Wheel.

First, we notice that while the rear wheel of the bicycle is driven the other rear wheel, i.e., the sidecar wheel, is a mere running wheel, and all the propulsive effort is exerted at one side (the bicycle side) of the machine. That side, therefore, is pushing forward, while the road friction and wind resistance, acting as a leverage, tend to hold the other side (the sidecar side) back. There is, therefore, a tendency for the bicycle to run round the sidecar, and this is noticeable in practice by an inclination of the combination to run to the left, supposing, that is, that the sidecar is fitted to the near side of the bicycle. The tendency is not a strong one, because when a wheel mounted on a fixed axle is rolling along the road it has a strong predilection for continuing in the path in which its own plane lies; the road friction resists any deflection to left or right. The rear and side wheels of the combination act in this manner, and so does the steering wheel if it is held rigidly straight. Still, this is only a resistance—it is not an active force tending to incline the machine either to right or left, and so there is still, so to speak, a balance of force tending to run the machine a little to the left all the time it is being driven. This is the natural state of affairs, and one can only give the machine a tendency to run straight while the steering is left free or "hands off" by some artificial means. One method is to set the side wheel with its axis a little forward of that of the driving wheel. This has only a partial effect—it merely increases the distance through which the side wheel must give or skid laterally in order to allow the machine, as a whole, to run a given amount to the left. Even if the side wheel were placed so far forward as to lie by the side of the front wheel, the com-

bination, if given its head, would still describe a curve with its centre on the left—a long, long way on the left, for the curve would be a very big one; but still, there it would be. At the same time, too, such a disposition of the wheels would make it extremely difficult to steer either to right or left, especially the left, when one wanted to do so. In fact, if this device is resorted to at all, the side wheel should be advanced only a very few inches.

Another expedient is to set the sidecar wheel *désaxé* in another sense to the driving wheel, viz., with the outer end inclined a little forward. This is a positive method, as it sets up a tendency to run the whole machine to the right, and, if correctly done, will just balance the tendency to run to the left when the machine is being propelled with the normal force. It may seem rather a barbarous thing to set the side wheel axle off the square in this way, as it involves "spinning" of the side wheel and scrape of its tyre on the road practically all the time. But before condemning it we must remember that in actual practice the combination is always prevented by some means or other from trailing away to the left; it is made to keep a practically true course somehow, even if the two rear wheels are co-axial. The explanation is that the driver consciously or unconsciously inclines the steering wheel a little to the right, and so subjects his front wheel and tyre to the same kind of spinning and scraping as the side wheel has to endure when its axle is inclined in the way just described, though perhaps not to the same degree.

### The Steering Head.

In this connection it is interesting to observe that a sidecar combination should have its steering laid out differently from that of a bicycle. With the latter the casting action secured by carrying the steering axis forward of the point of contact between the front wheel and the road is decidedly beneficial, but with the three-wheeler it is the reverse. For notice what takes place. In running along, say, the side wheel strikes an obstacle; it is thereby relatively slung back, the machine rotating through a small angle having the point of contact between the driving wheel and the road as centre. The effect in front is to swing the steering axis some distance to the left, and the front wheel, pivoting on its point of contact with the road, is thereby deflected to the left also. The arrangement of the steering thus helps the obstacle to slew the machine to the left. This has to be counteracted by the muscular effort of the rider, and on a rough road soon becomes tiring.

If, for sidecar purposes, the steering axis were made to pass right through the point of contact between the front wheel and the road, the lateral

**A Plea for the Steerable Sidecar Wheel.—**

force, acting on the front of the machine when, to put it generally, the progress of the side wheel is obstructed, would have no tendency to deflect the wheel, but only to remove it bodily sideways, and this would be resisted more or less completely by the grip of the front tyre on the road.

Indeed, it might be worth while to carry the modification a little farther, and, in a machine to be used for passenger work wholly, set out the steering with the axis passing a little behind the point of contact. Then the retardation of the side wheel in throwing the front of the machine to the left would deflect the steering wheel a little to the right, and so produce automatically that counterbalancing tendency to steer the machine to the right which the rider now has to produce positively by his own efforts. And with such an arrangement, when the side wheel encountered a more serious obstacle, the steering wheel would be simultaneously slung sharply farther over to the right, and so would produce an instantaneous antidote and maintain a straight course for the machine instead of exaggerating a deviation.

So far as rigid sidecars are concerned, therefore, a slight tendency to run to the left is natural and not so much a fault as an objection. The best way to cure it, if at all, is by bringing back the steering axis, and, failing that, to incline the side wheel slightly inwards; that is, to the right in front.

But even at its best the rigid sidecar is very far from ideal as to its steering, and one asks whether it is not time some real improvement were introduced in sidecar construction—something more radical than the elaboration of the bodywork, and something more intelligent than the lowering of the centre of gravity at the expense of the strength and lightness of the frame.

And the candid critic was right when he said that the side wheel of a sidecar ought to be either driven or steered. Driving the side wheel is by no means an impossibility, but it is a much simpler job to steer it, and steer it properly, if one pays due regard to the circumstances of the case.

**The Advantages of a Steerable Wheel.**

As long ago as 21st October, 1908, Mr. B. H. Davies—writing in *The Motor Cycle* on “Which is the best sidecar?”—gave his verdict in favour of the steerable wheel type, and said:

“Mr. R. G. Booth and myself concur in claiming for it the following advantages:

- “1. No sideslip whatever, even with plain tyres.
- “2. Perfect sociability.
- “3. Takes any corner safely at speed, right or left.
- “4. Will always come up to the crown of the road off the camber quite obediently.

“5. A minimum of side pull, hence minimum of power required to pull it.

“6. Safe to ride solus, or easily driven from chair.”

And in *The Motor Cycle* of 1st July last a new patent is reviewed in which the side wheel is described as being so mounted that it is deflected to right and left in unison with the steering wheel of the bicycle.

Now one great merit of the steerable sidecar of 1908 was that the side wheel was set about equidistantly from the other two wheels—that is, half-way along the side of the bicycle—so that its axis came well under the load. The weight of the passenger was about evenly balanced over it, and so there was no more strain on the front of the frame than on the back, and breakages due to this cause were unknown.

We have already seen that if the sidecar wheel is at the back it should, broadly speaking, be co-axial with the driving wheel when running straight and remain so when rounding curves. But suppose for a moment it is a back wheel that has been lost, and that the side wheel is forward alongside the steering wheel. Then the sidecar wheel should be deflected through a rather less angle than the front wheel of the bicycle when turning to the right, and through a rather greater angle when turning to the left, so that both the front axes intersect at the same point on the rear axis, which point is also the centre of the curve being described by the combination as a whole. That is, the two front wheels should be deflected in this case in the same way as in a complete motor car.



A flexible sidecar of American design, so constructed that both bicycle and sidecar wheels lean over together in taking a corner.

From these two extreme cases it is not difficult to see that when the side wheel is placed amidships, the steering connections should be so arranged that, on the average, the side wheel should be deflected half as much as the bicycle steering wheel. There is not much trouble about this. Put briefly, the result is attained by making the steering arm of the side wheel double the length of the arm fixed to the fork carrying the front wheel.

In a motor car the intersection of the axes on the curve centre is attained approximately by setting the steering arms (or, more correctly, the lines passing through the wheel pivots and the pivots of the steering crossbar) so that they are directed towards the centre of the back axle. This sets up the necessary differential movement of the two wheels.

To apply the same principle to the case where the sidecar wheel is half-way along the machine may seem rather an awkward proposition at first. But it may be solved fairly simply if the side wheel is considered as having been moved back through an angle from the forward position. Then if the steering arms are swung round through the same angle they will be practically right for the new condition of things.



# NEW MODELS

## ILLUSTRATED REVIEWS OF 1916 PRODUCTIONS.

### THE IXION TWO-STROKE LIGHTWEIGHT SIDECAR OUTFIT.

**A** POINT which makes all the difference between a really good and an indifferent machine is, to a very great extent, undoubtedly, the attention given to detail. There can be very few machines on the market which have received more attention in this respect than the little double-purpose lightweight manufactured by the Ixion Motor Manufacturing Co., Birmingham. This machine, although only fitted with a  $2\frac{1}{2}$  h.p. two-stroke Peco engine, has been specially designed for light sidecar work, which work, judging by users' appreciative remarks, it does extremely efficiently. The manner in which the sidecar chassis is constructed and the method of attachment to the

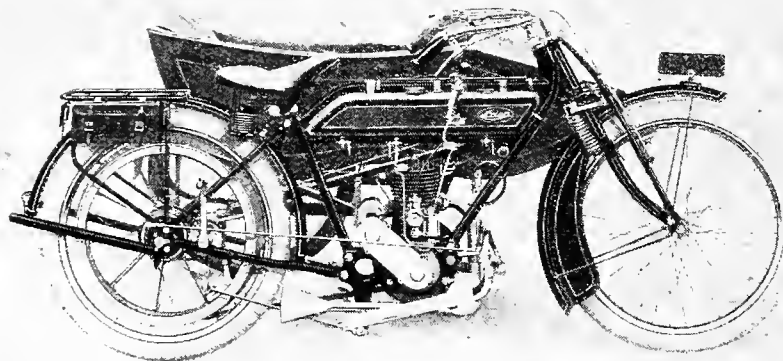
to a channel cast in the cylinder wall, whence it is conveyed to the various parts of the engine. The magneto is an E.I.C., and is situated behind the cylinder, and is chain driven. The latest pattern Druid, Mark IV, front forks are now fitted as standard, while, contrary to the other Ixion models, this machine is fitted with a three-speed hub gear. This type of gear, so far as heavy machines are concerned, is now almost extinct, its death knell having undoubtedly been sounded by the performances of certain types of this gear in both the Senior and Junior Tourist Trophy races in 1913, and in spite of the fact that the Junior race of that year was won by a machine fitted

with this type of gear, it has never since that time been really popular. There is, however, undoubtedly still a future for it in connection with small machines like the Ixion, for these gears possess many advantages which are entirely absent from the countershaft type. For instance, the beautifully sweet and simple change that any novice can make equally as well as riders of long standing, its absolute silence on all gears, and also the benefit of a simple adjustable pulley must not be forgotten.

Neat footboards are now fitted to this model, and the rear belt rim brake is operated by a heel pedal situated on the left. A short extension pipe from the silencer with a fishtail outlet is also fitted. The two main sidecar connections are incorporated with the cycle frame and brazed thereto, as are all other fittings such as brake attachments, gear-change lever, and so on.

#### The Sidecar.

The sidecar chassis is designed to give great rigidity, yet to be as light as possible. The main frame is in the form of a rectangle, while the front cycle connection, in addition to being attached to the front member, is also carried direct to the rear axle of the chassis, so forming a triangular brace, not only rendering the construction very rigid, but the propelling power is taken to the back of the machine, thus reducing to a minimum the torsional side strain always present in drawing a sidecar. The connections are very neat, and are also very quickly detached, this being easily ac-



bicycle are most noteworthy. The chief aim throughout the construction of both machine and sidecar has been to eliminate to the greatest possible extent all clips and joints, this not only producing great rigidity, but enhancing the appearance to a very considerable extent. The appearance can be judged from the illustrations.

#### The Bicycle.

The bicycle frame is most substantially made, the steering head is long and is braced by a webbing, while the top tube is dropped at the rear to enable a low riding position to be obtained. The  $2\frac{1}{2}$  h.p. Peco two-stroke engine has a bore and stroke of  $75 \times 79$  mm. (349 c.c.).

Lubrication is carried out by means of a pump sight feed lubricator, the pump now being placed at an angle to render it more easily operated from the saddle. From the sight drip the oil is conducted



Latest model Ixion lightweight passenger outfit. The engine is a two-stroke  $2\frac{1}{2}$  h.p. Peco, and drive is by belt direct to a Sturmey-Archer three-speed hub gear. The latest pattern Druid fork is fitted.

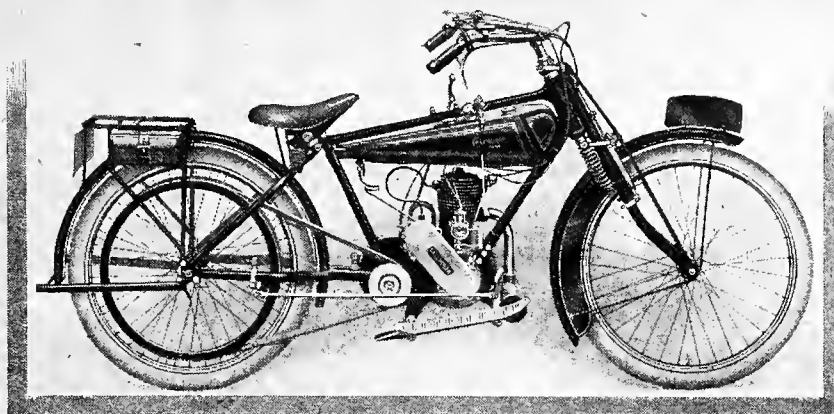
**few Models.—**

completed in three minutes. The rear connection consists of a metal ring formed on the rear axle of the chassis, which fits over a projection situated in a vertical position on the rear cycle stays, and is locked in position by a stud which screws into the centre of this projection. The front connection fits through a loop formed by a lug on the down tube, and is secured when in position by a large nut, the third connection being the usual diagonal tube from saddle pillar to the sidecar axle. The alignment of bicycle and sidecar is pre-arranged, and so adjustable or telescopic tubes are not provided, as the bicycle frames are built to a master sidecar chassis, while the sidecar chassis are built to a master frame. Brazed joints are reduced to a minimum by means of elaborately forged lugs. The neat body has been improved in appearance for this year by more sweeping curves, and the introduction of a door. It is supported on C springs, which are attached to the chassis on lugs brazed thereto. The shackles on which it is supported are made from forgings, and have a large bearing surface. Many improvements in the reduction of lugs and joints on the sidecar chassis are to be introduced directly the supply of the necessary forgings can be obtained, and these, as everyone knows, are at present extremely scarce. Of course, these little outfits are intended really for only light work over reasonably good road surfaces, but that they are up to almost any work was indicated by a letter which was read to us while at the Ixion works from a satisfied customer who had toured North Wales on one of these diminutive outfits with his wife and little child.

**A SPORTING POWERPLUS INDIAN.**

**Model G, with Rigid Frame and T.T. Bars.**

**A** MACHINE which should appeal to the sporting motor cyclist who delights in riding a powerful twin solo is the Model G Powerplus Indian. This model might be described as a T.T. model, as it has a rigid frame and T.T. bars as standard. It is a machine, however, which would be adequately suited to almost any amount of serious touring, fitted as



Latest model two-stroke Calthorpe. It is referred to below

it is with a three-speed gear box, clutch, and kick starter.

The latest model Indian Powerplus engine is fitted; this has a bore and stroke of 79x100 mm. (990 c.c.), and a nominal power of 7 h.p., though these engines have developed as much as 15-18 h.p. on the dynamometer test. Stand, carrier, folding footboards, 28in. x 3in. wheels, wide mudguards, and the famous Indian cradle spring front fork practically complete the ordinary specification.

**The Change Speed Gear.**

The three-speed gear box has been somewhat altered since it was first fitted to Indian models in 1914. Originally only one sliding gear wheel was used, the other two gears being engaged by means of dog clutches. This method, however, necessitated all the gears rotating idly and in mesh when top gear was in engagement, thus causing a certain amount of undue wear and noise. To overcome these slight defects, the sliding member now consists of the first and second speed layshaft pinions, while the top speed is still engaged by means of a dog clutch incorporated in the second-speed pinion. By this method it will be seen that when the top gear is engaged the layshaft will still revolve, but will not be meshing with any of the other pinions, thus ensuring more silent top-gear running. The multiple-disc clutch is operated on this model by means of a pedal, the return motion being actuated by the aid of a spring, so that the action is similar to the clutch motion on a car. In

order to facilitate clutch operation when riding solo, a hand lever is interconnected with the pedal mechanism in such a way that either method of operation may be used at will.

**The Engine.**

It will probably be known by many that the Powerplus Indian engine is one of the greatest departures from their previous practice that the Hendee Manufacturing Co. have made for some years. The chief variation from previous models is the arranging of the valves side by side, and the fitting of the timing mechanism in a separate timing case outside the main crank case. This has rendered the outside of the crank case extremely neat, as both the valve and magneto timing mechanism is now enclosed by one cover.

**THE NEW CALTHORPE TWO-STROKE.**

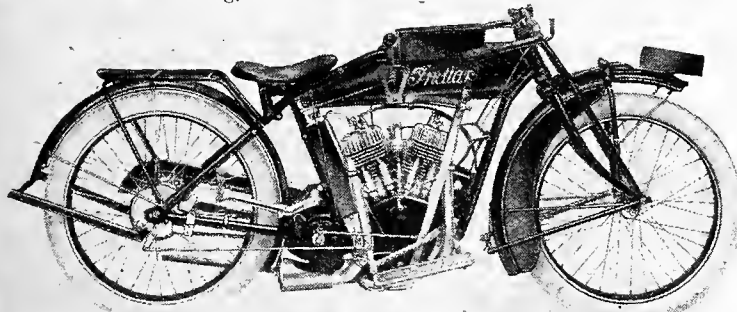
**I**T is expected that the man's model of the new two-stroke Calthorpe will be ready for delivery this month, and therefore a short resumé of its main features will not be out of place. The lady's edition of this machine was described and illustrated in our issue of October 7th, 1915, and the only difference in design is in the frame, tank, and dressguarding.

A feature of the new two-stroke Calthorpe is the sloping "Zeppelin" type tank that is also fitted to the 4 h.p. twin. Such a design undoubtedly enhances the appearance of the machine.

The two-stroke engine is of 245 c.c., the dimensions being 67 mm. x 69 mm. An Amac carburetter is fitted to the off side of the engine, and the magneto is located on an aluminium platform fixed to the rear of the crank case. The petrol system of lubrication is not employed on the two-stroke Calthorpe, but oil is led by a copper pipe to a groove encircling the cylinder. From this groove the oil finds its way through holes in the cylinder walls directly on to the piston.

The Enfield two-speed gear is now a standard fitting to both this and the lady's model. The final drive is by a 3in. Dunlop belt. Druid forks and 26in. x 2in. Moseley tyres are also standard fittings.

The two-stroke Calthorpe may also be purchased as a single-gear mount. The 1916 catalogue is now ready.



Sporting edition of the 1916 model Powerplus Indian. The standard model has a spring frame and touring handle-bars.

# A New Dunkley Passenger Model.

5 h.p. Twin-cylinder Four-speeder for Sidecar Work.

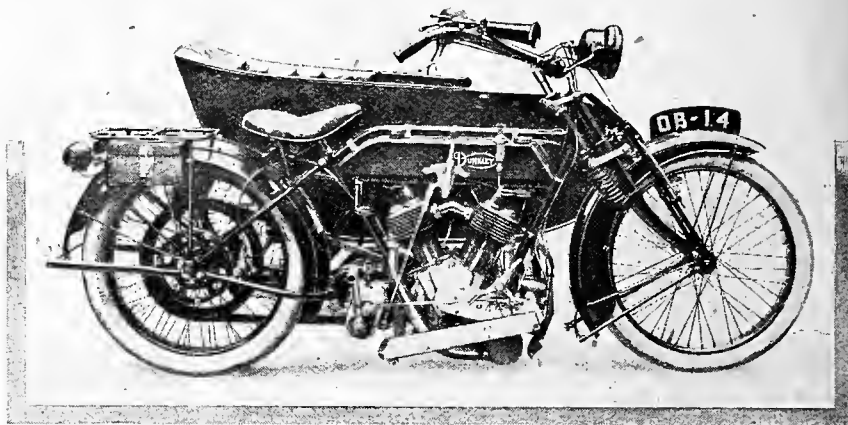
**F**OR sidecar work Messrs. Dunkley, Ltd., have placed on the market a substantially - built, medium-powered twin, made up for those who require the combination for fast touring or for use where the main road gradients make power the first requisite.

## Four Speeds a Standard Fitting.

The engine is a 5 h.p. twin J.A.P. with the magneto on a malleable bracket in front. It is fitted with an Amac carburetter. From the left-hand side a roller chain takes the drive to a Jardine four-speed gear box, to which is fitted a pulley of large diameter for the 1 1/2 in. rubber belt. The belt rim and pulley are almost the same size, thus providing a very large area of engagement for the belt, and so reducing the likelihood of slipping to a minimum. Further, the big gear box pulley makes it possible to use a large belt. As the Jardine four-speed gear has its driving shaft above the layshaft, the box is somewhat deep, and, were the special upturned bottom bracket not fitted, might reduce the ground clearance to a dangerous degree. This special bracket makes the wheelbase of the machine appear longer than it really is, and several people have been convinced only by measurement that the length is no more than 56 in.

Owing to material difficulties the sidecar lugs of the frame are separate castings brazed into position, instead of forming a part of the head and tank tube lug or the rear tank tube lug respectively, as was designed originally. There is a good length of tube between the two thrust bearings on the head. The engine is carried by four plates bolted in pairs respectively to the seat pillar tube and down tube.

There are two wooden aluminium covered footplates hung from horizontal tubes by strip steel pieces, and the right-



5 h.p. twin-cylinder four-speed passenger outfit—the latest Dunkley production.

hand footplate eventually will receive the brake pedal, now mounted as a temporary fitting on the horizontal tube supporting the plates. Similarly, the rear contracting brake is but temporary, as an expanding brake is to be fitted later on, the design following that of the rear brake on the Dunkley cycle car.

Druid spring forks, with the additional springs between the fork tubes and alongside the head, are fitted, and a wide mudguard is obtained by the aid of extensions secured to the normal mudguard's edge. In front is a 650 x 65 mm. three-rib Hutchinson tyre, and at the back a 650 x 75 mm., so that here at least is ample tyre surface for the work. Both wheels are strongly built with substantial rims to prevent damage from abnormal pot-holes, and thick spokes to deal with the weight, while the rear hub has ordinary cup and cone ball bearings, that at the front having roller bearings.

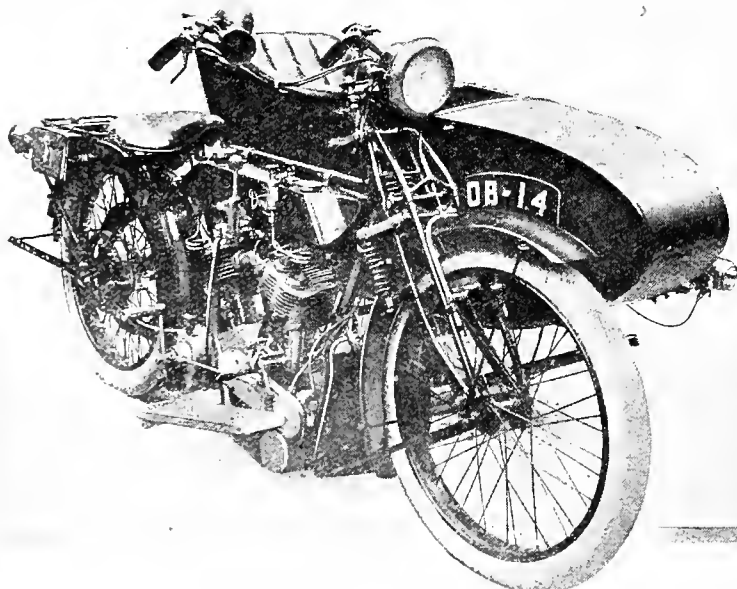
Most people will have suffered from

mudguards with a knack of detaching themselves in portions at a time, and therefore will rejoice to see that on this machine the possibility of trouble is small, a thick steel strip running right round the circumference of the guard and being doubled to form the rear stand clip; on the way the carrier also is held by this strip, while at intervals of about three inches the guard is held by rivets. In front of the Dixie magneto there is a metal mudguard to keep away that mud which escapes the valances of the front guard.

Obviously this is a machine for rough work as well as for ordinary touring, and one regrets that circumstances prevent its debut in something as strenuous, say, as the Scottish six days trials.

## A WATSONIAN SIDECAR AMBULANCE.

**A** SIDECAR body combining an ambulance and medical supply carrier is in course of construction by Messrs. The Watsonian Folding Sidecar Company, Birmingham. It consists of a long box about two and a half feet wide and possibly six feet long, composed of three-ply wood and fitted with a hinged lid. This box will be attached to a standard Watsonian chassis on very carefully designed springs in such a manner that the weight will be equally balanced and distributed over the back axle. Within the box an arrangement will be fitted upon which a stretcher will rest, so that it will be separately sprung. In order to provide a cover when a patient is being carried waterproof canvas will be fitted to the lid of the box, which will be held in an open position by means of stays in such a manner as to provide ample protection. When not used for patient carrying the body may be used as an ordinary box carrier, there being a large amount of space beneath the stretcher, even when this is in position. These motor cycle sidecar ambulances are not used with the British troops, the Red Cross maintaining that the springing is insufficiently good; but with the French and Italians they have proved quite serviceable.

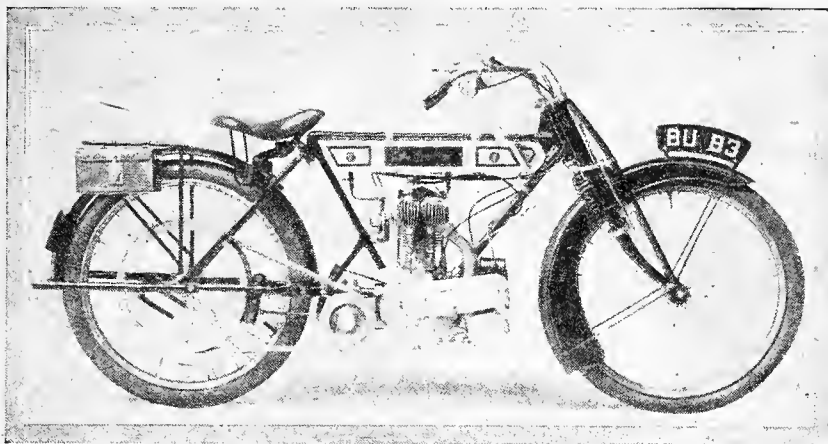


A three-quarter view of the new 5 h.p. Dunkley.

## LATEST BRADBURY MODEL.

A 2½ h.p. Single-cylinder Experimental Medium-weight.

**A** NEW Bradbury medium-weight is at present undergoing tests when Government work, with which Messrs. Bradbury and Co. are at present very busy, permits. It is not expected that the new model will be ready for the public until after the war, as the Government has taken up all their productive power. The engine of the new model is somewhat like the 3½ h.p. single-cylinder Bradbury, as the crank case forms part of the frame in the same way as in that machine. One side is detachable, in order to remove the flywheels when

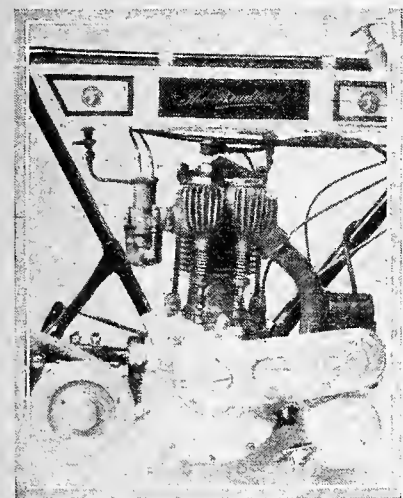


A new Bradbury single-cylinder model scaling 160 lb. The bore and stroke are 74.5 × 80 mm. = 348 c.c.

necessary, and held in position by means of bolts. The cylinder dimensions are 74.5 mm. × 80 mm., capacity 348 c.c. It also has side by side valves, and a detachable head, which is held in position by two long bolts fore and aft. These also secure the cylinder to the crank case by means of a strong bridge piece. The finish of the cylinder is dull nickel plate. The Dixie magneto is situated in front, and is chain-driven, while the usual internal exhaust valve lifting mechanism has been discarded and a neat external lifter fitted. Both valve tappets are adjustable.

A two-speed countershaft gear box is fitted while a combination of chain and belt forms the transmission.

The frame is somewhat unorthodox, the top tube being perfectly straight from the head to the rear down tube. The saddle-pillar lug is situated behind this tube, but placed somewhat below the level of the top tube, so as to obtain the lowest possible saddle position. The steering head is long in order to obtain good steering, and is supported by strong webs. The rear brake, operating on the inside of the V of the belt rim, enables the rear wheel to be removed without disturbing the adjustment of the brake. The weight of this little mount is only 160 lb., including toolbag and tools, while, as will be observed from the illustrations, the appearance is decidedly neat and attractive.



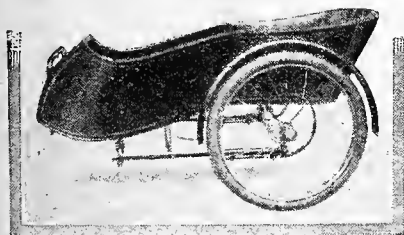
Power unit of the new chain-cum-belt driven Bradbury. The usual Bradbury system of building the frame and crank case as a unit is retained.

## A NOVEL SIDECAR BODY.

**T**O obtain lightness, combined with the neat appearance presented by the coachbuilt sidecar, a new model G.K. body has been introduced. This,

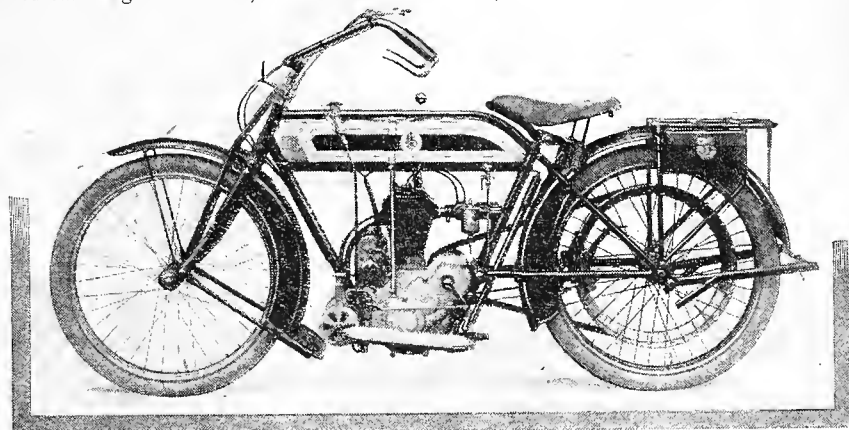
coachbuilt pattern. The appearance is quite pleasing, and, with the growing use of sidecars on light and medium weight machines, should meet a

good demand. G.K. sidecars are made by the G.K. Sidecar Co. at the Lorenzo Works, Lorenzo Street, Pentonville Road, N.



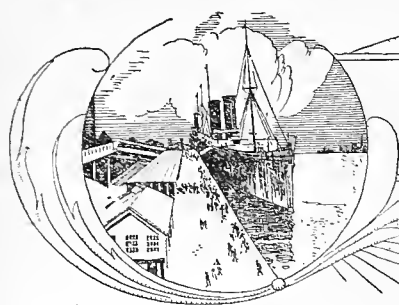
G.K. lightweight canework sidecar covered with patent leather, so presenting the appearance of a coach-built body.

whilst bearing the outward appearance presented by the average coachbuilt type, is really made of canework, the latter being covered with patent leather, thereby obtaining the resilience, easy riding, and light weight of the canework body, combined with the neat appearance, convenience for cleaning, etc., of the



A new belt-driven Bianchi motor bicycle—an Italian production. The engine is a 3½-4 h.p. of 75 × 112 mm. bore and stroke, giving a capacity of 495 c.c. A three-speed gear box is embodied with the crank case. Previous models have been chain-driven. It may be noticed that there are quite a number of British fittings on this machine, which throughout closely follows British design.





## Extracts from Overseas Letters.

### The Opinions of Motor Cyclists scattered all Over the World.

**T**HIS issue being the first of the month we give below a further selection of extracts of the opinions and impressions of our readers in different parts of the world. We commend these communications (many of which are immensely practical, voicing as they do the studied judgments of seasoned riders on the question of design of motor cycles) to manufacturers, and feel confident that a consideration of the opinions may prove beneficial. The question of design, however, does not form the subject of every letter, as will be seen, though it is a fact that one of the two points which appear to constitute the chief grievances of Overseas readers concerning British machines is the question of springing. The other contentious subject is the question of charges by agents, the Overseas buyer always comparing the price he is asked with the British price. This, however, is not altogether fair, even after adding freight charges and duty, for there are many points which enter into the agent's settlement of terms, such as the question of placing orders and deposits long beforehand, the extra amount involved, and the risk run.

The letters this month, it will be noticed, emanate mainly from British Dominions, and include a communication from Samoa, one of the German possessions in the Pacific Ocean captured during the

war. The major portion come from Australia (especially New South Wales) and New Zealand, in which countries, as our pages have already shown, the motor cycle is immensely popular.

We have endeavoured to select opinions which give the greatest diversity. Many a true Britisher notes with misgiving the hold which is being taken of the trade in our Colonies by American manufacturers, and frequently expresses the hope that after the war British makers will concentrate their attention on Overseas trade. We have no doubt whatever that they will do so, for with the more complete equipment of their works with the latest labour-saving machine tools, the expense of which has been directly occasioned by the war, our makers at home will be better able to produce machines in quantities, and may have enough and to spare for the home market, which will automatically cause them to turn their attention abroad. Again, by reason of the valuable experience which is being obtained in the war zone, the design of our motor cycles will be such that they will be eminently suitable for the exacting conditions of Overseas service.

Finally, we may express our appreciation of the continuous inflow of letters from enthusiastic readers, and invite further communications from motor cyclists wherever they may be located.

MOTOR CYCLISTS  
AT THE CAPE.



Members of the Cape Peninsula (S.A.) Motor Cycle Club, photographed on the occasion of the annual run to Hout Bay, near Capetown.

# Extracts from Overseas Letters.

## "The Motor Cycle" appreciated in the South Seas.

MAJOR W. M. KAY, a member of the New Zealand Expeditionary Force, stationed in Samoa, writes: "A copy of *The Motor Cycle* which has just reached me is the first I have received since the war began. I therefore anticipate a pleasant half-hour or so between whiles, as it were. I have been a subscriber since I have been in possession of a motor cycle."

## Why Motor Cycles are becoming Popular in Africa.

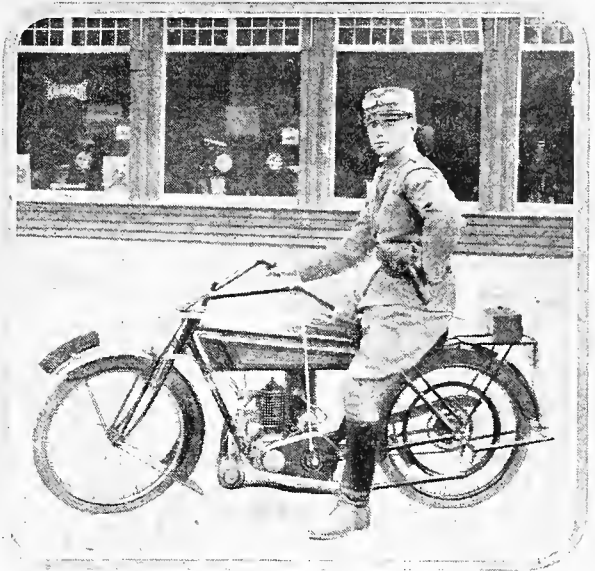
MR. H. N. LLOYD, Pretoria, South Africa: "The public are fast realising the numerous advantages provided by a motor cycle in a country such as this, where horse and cattle diseases are rife, where distances to be covered between towns are very lengthy, and the roads and paths, though far from good, are seldom impossible for the modern motor cycle."

## Factory Control of Prices.

MR. J. E. KNAGGS, Pretoria, South Africa: "I would suggest that in order to stop the excessive prices charged by agents the manufacturers should establish factory controlled depots, and not leave the decision of the sale prices to agents, who take advantage of the popularity of certain makes to increase their profit per machine. Advertisers in *The Motor Cycle* should always quote prices for Overseas. This would enable us to import with the least possible delay."

## A Most Satisfactory Machine.

MR. A. T. BEAULEY, Poonabaran, N.S.W.: "The machine I now ride is a 3½ h.p. T.T. Abingdon. It was one of the first of this make to come to New South Wales, and is now five years old, and must have covered about 20,000 miles since it was new, and so far has never compelled me to walk. I consider this a fine performance in Australia, where the conditions are of a very varying nature. I have sometimes ridden 100 miles in three and a half hours when the temperature has been between 105° to 110° in the shade, and have never noticed any signs of overheating. Mudguards which may be very efficient in England are frequently no use whatever out here. They require a much greater clearance than is usually allowed, and the side flaps are very little use."



An officer of the motor cycling corps of the Danish Army mounted on his two-stroke 2½ h.p. Royal Enfield.

## "The Motor Cycle" in Uganda.

MR. F. G. GORTON, Kampala, Uganda: "I have only been motor cycling a year, and have in that period succumbed to your paper. I am renewing my subscription, as it is an absolute necessity in an isolated country like this to have such a paper near at hand for information and advice."

## Reinforced Frames Desirable.

MR. G. L. BETTS, Burwood, N.S.W.: "Specially reinforced frames are desirable out here, as the country roads are very bad at times. The best and easiest method, to my way of thinking, is to braze a piece of flat steel about one-eighth of an inch thick in the tubing on its edge from lug to lug."

## A Ground Clearance of 5in. Desired.

MR. W. THIN, Canterbury, New Zealand: "This district (Canterbury) is fairly level, and most of the roads passably good, so that I think almost any of the standard makes of machine are suitable, though it would be an advantage to have the magneto placed behind the engine and as high as possible, as we have often to cross water-races which flow across the road. Mudguarding should be better, and ground clearance not less than five inches."

## Not much Choice of Routes.

MR. S. C. DELANEY, Kimberley, South Africa: "I have found my three-speed Hazlewood most satisfactory for the roads here. I simply use my machine as a means of transport to and from the office. There are only two roads out of this town, one to Boohog, Orange Free State, and one to the Modder River, so you see we have not much choice of routes for pleasure rides."

## "Motorecyclitis" in New Zealand.

MR. D. HANCOX, Ngaio, Wellington, New Zealand: "A friend and I are both affected with that common disease 'motorecyclitis.' We have many diseases in these healthful isles, but the aforementioned one is even worse than small-pox or even plague, by the way that those affected talk of their experiences."

"This small suburb, which lies about three miles from Wellington on the Manucoat line, is accessible from Wellington by road only through the Kaiwarra Gorge. Owing to insufficient train service to and from town nearly half the male portion of the community are all-weather motor cyclists. The Gorge portion of our daily route is steep, narrow, and has a very bad surface. To make matters worse, every winter sees the whole length of the Gorge portion of the road (a distance of 1½ miles) metalled, which is left to be rolled in by the traffic."



## WITH THE CANADIANS TRAINING IN TORONTO.

Pte. A. T. Walker, despatch rider attached to 97th Canadian Batt., and Sgt. Ward, of the 12th York Rangers. The sidecar outfit is an American-Excelsior.

## Extracts from Overseas letters.

## Spring Frames an Attraction.

MR. CLIFFORD LONG, Auckland, New Zealand: "Apart from the price, the American machines seem liable to become popular here on account of their large wheels, superior springing, and general suitability to our roads."

## Prices of Spares.

MR. H. M. LAWRENCE, Wellington, N.Z.: "One can obtain very few spares out here for British machines, with the exception of one or two of the leading firms, and then the price is very high. On the other hand, spares for American machines can be obtained easily and at cheap rates."

## Locally made Spare Parts.

MR. J. B. WESTWOOD, Sydney, N.S.W.: "The difference in prices asked for some of the leading British makes out here compared with the American is very great. The worst fault to find with agents out here is their neglect to have spare parts made locally. If they suddenly find they are out of stock of any part, the cost of making them locally is usually rather more than those received from the makers; otherwise we are kept waiting until the spares arrive."

## Sidecars a Weak Point.

MR. T. S. TAYSON, Maritzburg, Natal, S. Africa: "The usual run of sidecar chassis is nothing like strong enough for the rough roads out here. Breakages are very frequent. My present machine, an A.J.S. combination, seems perfection, as in 12,000 miles practically the only trouble has been with the sidecar springs and shackles."

## A Reader's Ideal Machine.

MR. G.W.A., Gilgandro, N.S.W.: "My ideal machine for work here would have a horizontal twin engine of about 2½ to 3 h.p., very easily accessible, and a three-speed countershaft gear with chain and belt drive, the chain to be enclosed and the belt pulley to be very large, about 8in., and adjustable. The frame should be sprung fore and aft in a similar manner to the Indian, and made of heavy gauge straight tubes, if possible, like the Scott. The wheels must be fitted with extra heavy rims, as the present kind kink and crumple up in no time; heavy spokes and 3in. tyres are also necessary. There should be at least 2in. clearance between mudguards and wheels. Handle-bar-operated clutch and gear controls are also desirable features. The clearance between the lowest portion of machine and ground should not be less than six or seven inches."

## Notes and News from Overseas.

## Racing in Western Australia.

TWO or three months ago we mentioned the novel racing track, in the form of the dry bed of a lake, used during the dry season by the Goldfields Motor Club of Western Australia. Lake Perkolilli, as it is known, is about twenty-two miles from Kalgoorlie, and a short time ago the club held their fifth picnic and sports meeting thereon. The Sick and Wounded Soldiers' Fund greatly benefited by the success of the gathering.

Racing resulted as follows:

## FOUR MILES OPEN HANDICAP.

- |                              |                         |
|------------------------------|-------------------------|
| 1. C. Lewis (7 Indian), scr. | 3. J. Helnr (3½ Singer) |
| 2. A. E. Geere (2¼ Douglas). | Winner's time, 5m. 57s. |

## TEN MILES.—4 H.P. MACHINES AND UNDER.

- |                             |                          |
|-----------------------------|--------------------------|
| 1. C. Lewis (3½ Triumph).   | 3. J. Helnr (3½ Singer). |
| 2. A. E. Pike (3½ Triumph). | Winner's time, 11m. 20s. |

## FOUR MILES.—TOURING MACHINES.

- |                            |                          |
|----------------------------|--------------------------|
| 1. A. McDonald (4 B.S.A.). | 3. C. Long (3½ Douglas). |
| 2. O. Parker (2¼ Douglas). | Winner's time, 4m. 57s.  |

## FOUR MILES.—3½ H.P. AND OVER.

- |                               |                             |
|-------------------------------|-----------------------------|
| 1. T. H. Rnsell (3½ B.S.A.).  | 3. A. E. Pike (3½ Triumph). |
| 2. L. Pilkington (3½ B.S.A.). | Winner's time, 4m. 21s.     |

## FOUR MILES.—PUBLICANS' PURSE.

- |                             |                          |
|-----------------------------|--------------------------|
| 1. A. E. Pike (3½ Triumph). | 3. J. Helnr (3½ Singer). |
| 2. C. Lewis (7 Indian).     |                          |

## FOUR MILES FINAL HANDICAP.

- |                            |                                |
|----------------------------|--------------------------------|
| 1. A. McDonald (4 B.S.A.). | 3. A. Williamson (3½ Triumph). |
| 2. O. Parker (2¼ Douglas). | Winner's time, 4m. 35s.        |

## The Victorian "Jungle."

Certain American newspapers, and in particular the advertisers therein, are notorious over here for, what appears to the British, the extravagant, and at times amusing, language used. A typical example of what we mean is the advertisement of the makers of the magneto used by Erwin Baker in his 1,000 miles Victorian road record. "Warhorse Baker," we are told, "added another world's record to his string when he covered 1,000 miles of Australian brush-strewn, jungle-like roads in 21h. 3m." We did not know until now that there were "brush-strewn jungle-like roads" in Victoria, though the writer has a limited amount of personal experience of motoring in that State of the Commonwealth.

## Commercial Use of the Motor Cycle.

As indicating the spread of the motor cycle for commercial purposes in the United States, it may be noted that the People's Gas Light and Coke Co. of Chicago have just acquired forty-five Harley-Davidson machines. These will be used by the company's collectors, travellers, and mechanics.

## American Magneto Company's Profits.

The Splittorf Electrical Co., of Newark, New Jersey, known in this country as the makers of the Dixie magneto, have had a successful financial year. During 1915 a net profit of 745,107.55 dollars was made, this being nearly twice as much as the total net profit for the year ending December 31st, 1914. Needless to say, the demand from Great Britain for American-made magnetos, due to the war, has had a lot to do with this satisfactory (from the shareholders' point of view) state of affairs.

## Canadian Import Duty.

The import duty before the war on motor cycles imported into Canada from the United States was 35%. Since the outbreak of war an additional 7½% war tax has been made, and now the latest rumour is that the latter is to be doubled. Thus, there is a prospect of 50% having to be paid on American machines imported into the Dominion.

## N.S.W. Trial.

The Bathurst, Orange, and Lithgow (New South Wales) motor cycling clubs have held an inter-team trial, consisting of a 122 miles speed-judging test. First place was secured by a Bathurst rider, C. A. Gregory (6 h.p. Matchless).



Start of the Goldfields (W.A.) Motor Club's 100 miles reliability trial. The machines, which were all British, included six B.S.A.'s, two Triumphs, a Douglas, Enfield, and a Singer.

# "The Motor Cycle" Recruiting Section.

Immediate Vacancies in the M.M.G.S. The Position of R.E. Despatch Riders.

THE response to the appeal for recruits in the last issue of *The Motor Cycle* was no less than anticipated, the fact of practically all the different Army motor cyclist sections having been closed for some time causing men to seize the first chance that cropped up of vacancies in a similar section. The number of men at present required by the Motor Machine Gun Service is of course, limited, but the need is urgent, and only men who can join up immediately may be accepted. Something like 260 forms of application such as appeared in our last issue have been filled up and returned, but in many cases the applicants had omitted to mention their age or Group No., and frequently, in the case of married men, it was stated that they would join when their Groups were called up. Under this arrangement, however, only a few men can be accepted at present, as the vacancies which now exist must be filled with men who are ready to join at once.

## The Case of Single Men.

The Editor regrets that he has been unable to do anything for single men who have been called up under the Group System for a certain date, but it is probable that the War Office may later arrange for their transfer to the M.M.G.S. We hope to make a further announcement on this subject in a later issue.

A number of mechanics have offered their services, but there are no vacancies for this class of recruit at present, only sidecar drivers and gunners being required. The particulars appeared on page 188 last week.

To-morrow (Friday) afternoon, from 2.30 to 4 o'clock, Mr. Geoffrey Smith will be in attendance at the Recruiting Office, Little Park Street, Coventry, and will accept there and then experienced motor cyclists who are able to join up at the Training Centre at once. Railway warrants have been issued to motor cyclists scattered all over the United Kingdom, whose particulars were in order, but any other married men of good physique, either attested or unattested, and who are sidecar drivers, will be considered if they turn up at the time and place mentioned above. Applicants should bring their Reserve cards with them, together with marriage certificate and birth certificates of children (if any).

Should the number of suitable applicants exceed the vacancies which exist, a further waiting list will be formed in anticipation of further demands for men.

## FROM SOUTH AFRICA TO ENLIST IN M.M.G.S.

A NEW recruit for the M.M.G.S. is Cyril E. Barnard, who only arrived home from S. Africa a few weeks ago. One of his brothers, Eric Barnard, is a captain in the 7th Gloucesters, and the other, George, will be remembered by many as the winner of *The Motor Cycle* Cup at the Khaki meeting at Brooklands last August. George Barnard holds a commission in the R.E., and is at present in Egypt.

## R.E. DESPATCH RIDERS.

### Central Office Announcement.

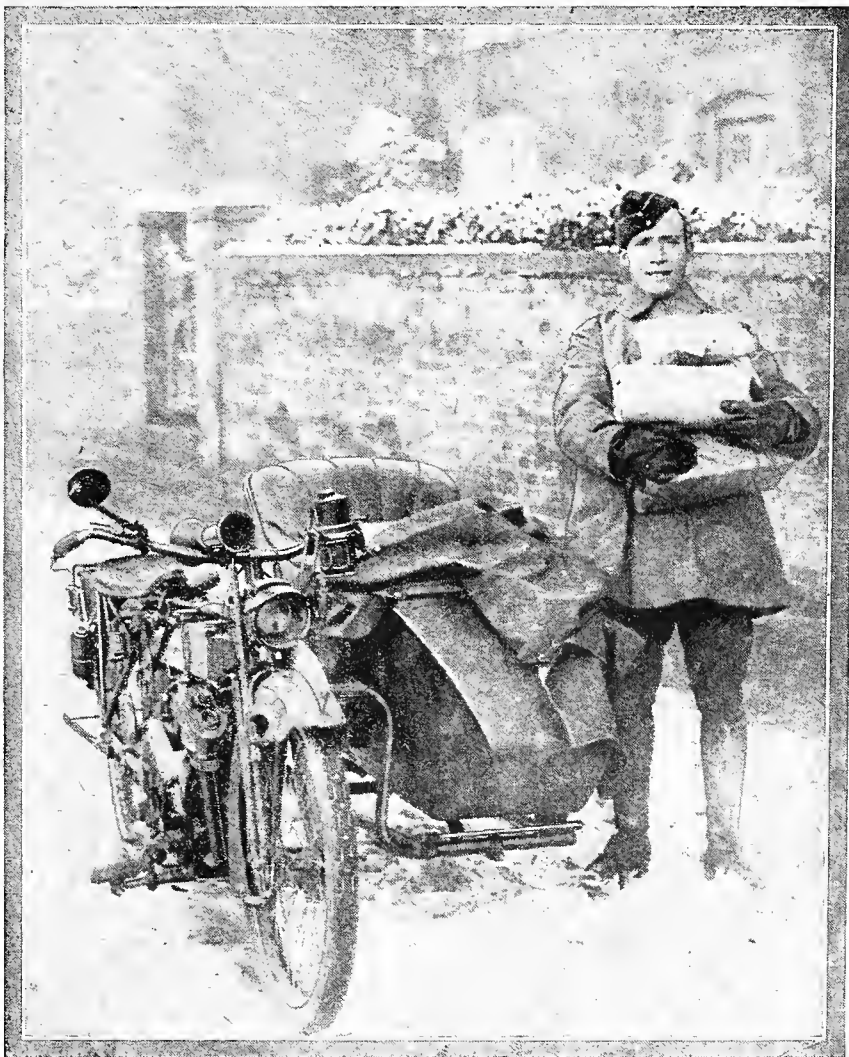
SINGLE men of Groups 14 upwards whose names are already on the waiting list are authorised to enlist in the Motor Cyclist Section of the Royal Engineers when their particular groups are called up. It is to be regretted that there are no vacancies for men in Groups 10, 11, 12, and 13, but it is hoped that they will be able to arrange their transfer to other motor cycle branches of the Army.

In response to continued enquiries, there are still no vacancies for despatch riders in the Royal Engineers section,

the waiting lists being rather lengthy, and we also understand that sufficient motor cyclists have been obtained to satisfy the present requirements of the Royal Flying Corps.

## SOUTH MIDLAND DIVISIONAL AREA WAITING LIST.

ALL motor cyclists on the waiting list of the South Midland Div. Area are requested to notify Sec.-Lt. H. Smith, Secretary Motor Cyclist Reserve Committee, 6, Brynland Avenue, Bishopston, Bristol, immediately they are called up under the Group system. They should at the same time forward their "Group" and "Registration" numbers.



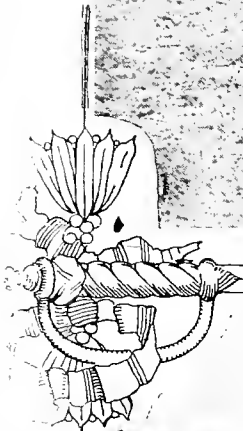
An R.F.C. motor cyclist, somewhere in the Midlands, calls at the village post office for the parcels post. The outfit is a P. and M., this make being used exclusively by the Royal Flying Corps.



# Viscount French Motor Mac



2



4

**L**AST week Field Mar  
Commander-in-Chief  
paid a visit of inspe  
Gun training centre in tl  
the same time he decorated  
and Gunner Raffety—who  
issue, have each received  
the 3rd Class Order of St  
pictures show:

- (1.) Viscount French decor
- (2.) Motor machine guns co
- (3.) Sgt. Mackey recontri  
experiences at Hooge, for whic
- (4.) Inspecting the office  
Viscount French is Lt.-Col. B  
Commanding the M.M.G. Tra
- (5.) Taking up positions pr
- (6.) Inspecting the Vickers-  
the background following Visc  
more.



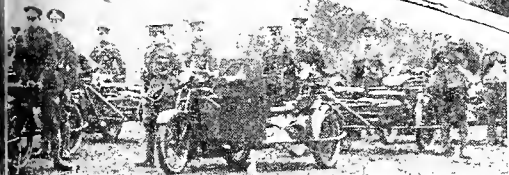
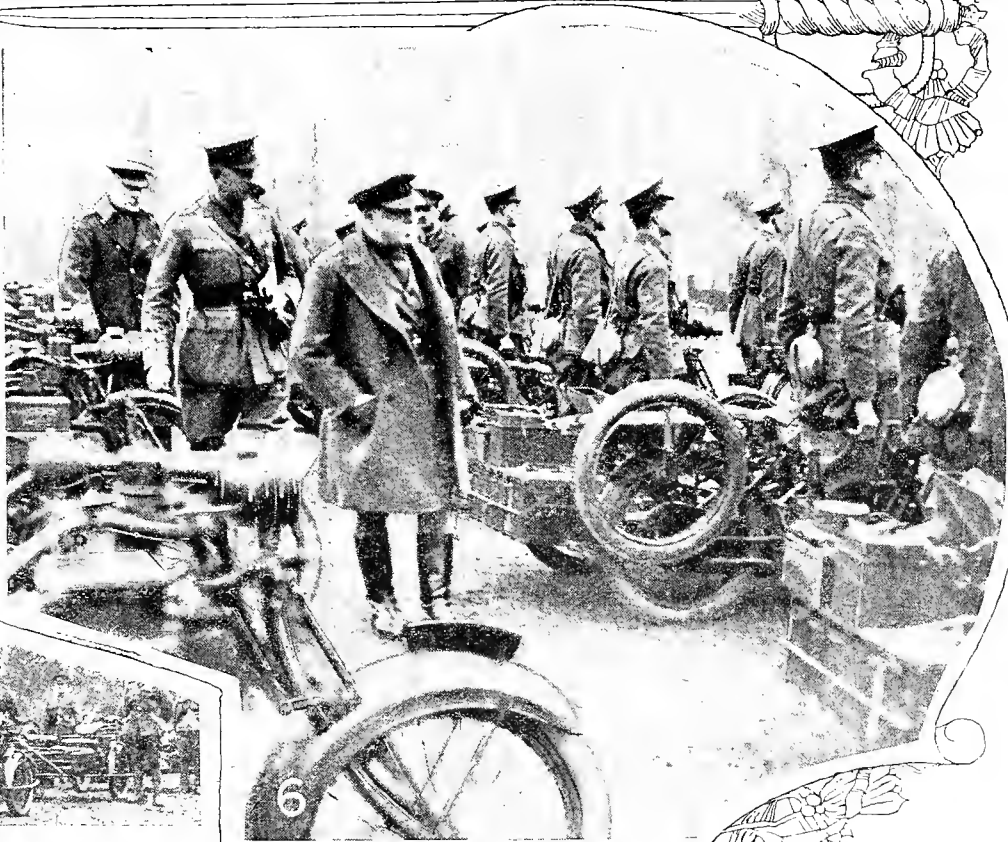
5

# inspects the e Guns.



count French, now  
Home Defences,  
the Motor Machine  
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mentioned in our last  
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to the parade ground.  
Viscount French his  
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adley, D.S.O., Officer  
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nch is Lord Cheyles-





## TIME TO LIGHT LAMPS

GREENWICH TIME.

March 2nd	...	6.8 p.m.
" 4th	...	6.12 "
" 6th	...	6.16 "
" 8th	...	6.19 "

### Our Spring Number.

The annual spring number of *The Motor Cycle* will this year appear on Thursday, April 13th, a week before the Easter Holidays. All our regular writers will contribute features to this issue.

### A Club's Honour List.

There are now 154 members of the North-Eastern Automobile Association whose names have been reported as on active service, though there are probably many more about whom information has not yet been received.

### New Road Board Grants.

The Road Board have informed county authorities that, in view of the desire of the Ministry of Munitions to encourage the use of refined tar so as to maintain the supply of distillation products for high explosives, and also with a view to protect important roads from disintegration, the Board have been authorised by the Treasury to make new grants and loans to an aggregate amount of £200,000 towards the work of surface tarring, pitch grouting, and tar macadam.

### Scottish Lighting Regulations.

New lighting regulations for Scotland have been issued under an Order dated February 9th, 1916. In the following districts lamps not exceeding 12 c.p. and dimmed by one sheet of tissue paper are the limit. The parishes hereinafter named and that part of Scotland which lies to the south of a line passing from the coast of Aberdeenshire to the west coast of Argyllshire through the said parishes, and all other areas in Scotland which are within six miles of the sea\* and are not included in the foregoing areas:

Counties.	Parishes.
Aberdeen	Aberdeen, Peterculter, Drumoak,
Kincardine	Dornie, Glenbervie, Fordoun,
	Marykirk.
Forfar	Logie Pert, Dun, Brechin, Kinnell, Guthrie, Kirkcubbin, Dunnichen, Forfar, Glamis, Bessie and Nevay, Newtyle, Kettins.
Perth	Abernyte, Kinnaird, Kilspindie, Stone, Redgorton, Tibbermore, Forvie.
Kinross	Orwell, Fossoway.
Fife	Saline, Culross.
Clackmannan	Clackmannan, Dollar, Tilliecountry, Alva.
Stirling	Logie, Stirling, St. Ninians, Garngunock, Kippen, Drymen, Buchanan.
Dumharton	Arraigar, Luss, Row, Rosneath.
Argyll	Dunoon, Inverchaolain, Kilfinan, Kilmacdonnell.

\* Within six miles of the sea\* means all places within six miles of the sea or the navigable waters of any estuary.

## SPECIAL FEATURES

A PLEA FOR THE STEERABLE SIDECAR.  
OPINIONS FROM READERS OVERSEAS 1916 MODELS.

### The National War Funds.

At the week-end the principal war funds stood as follows:

The Prince of Wales's National Relief Fund (£2,978,000 distributed)	£5,755,612	0	0
The Queen's Work for Women Fund	168,494	11	6
Fund for the Sick and Wounded	3,394,131	0	0
Tobacco Fund	100,532	0	0

### North-Eastern A.A.

The annual general meeting of this Association was to be held yesterday (Wednesday) in Newcastle-upon-Tyne. The meeting of the motor cycle section was to follow. The latter has been practically moribund during 1915 owing to the war.

### A Small Horizontal Twin.

In our next issue we shall describe a particularly interesting machine, the engine of which is a horizontal twin of only 226 c.c. At present it is only in an experimental stage, but if and when placed on the market the weight of the complete machine, we are told, should not be more than 85 lb.

### A.A. Badge behind the Firing Line.

A soldier, who in peace times is an Automobile Association patrol, recently brought to the A.A. headquarters a broken A.A. badge that he picked up behind the firing line in France. The badge showed marks of having been blown off a car by shell fire.



The twenty-five guinea silver challenge cup presented by *The Motor Cycle* to the Doncaster and District A.C. (M.C. Section), which was won at the Doncaster Speed Trials by S. R. Axford in 1914. The cup is 17½ in. in height, and weighs 3 lb. 6 ozs. Further shields will be added to the plinth, bearing the different winners' names.

### New Models in this Issue.

Among the 1916 model motor cycles described and illustrated in this issue are the—

- 2½ h.p. Bradbury medium weight.
- 6 h.p. Dunkley.
- Two-stroke Calthorpe.
- 7 h.p. Indian sporting Powerplus.
- Ixion lightweight sidecar outfit.
- G.K. sidecar attachment.

One or two of the above machines are entirely new productions, and have not hitherto been described in print.

The exclusive photographs in the centre double pages of Field Marshal Viscount French inspecting Motor Machine Gun Batteries are by our own photographer. Enlargements of these negatives are on exhibition at the Motor Machine Gun Training Centre.

### Auto Cycle Union Notes.

At a meeting of the General Committee, held on February 24th, matters of more than usual interest to our readers were discussed, as the following indicates:

The following resolution, being duly moved and seconded, was carried unanimously: "That, owing to circumstances caused by the war, the operation of rules 28, 29, 30, and 31, which provide for the annual reconstitution of the committee, shall this year be suspended, and that the present committee and officers shall remain in office for a further twelve months."

**ELECTION OF NEW MEMBERS.**—The Secretary submitted the names of nine candidates for election as town members, and twenty-one as country members, all of whom were afterwards duly elected.

Arising therefrom, it was unanimously agreed that in future a country member shall be held to be a member not having a residential or business address within twenty miles radius of Charing Cross, and that any existing rules or regulations to the contrary be accordingly amended to this effect.

**ANNUAL GENERAL MEETING.**—It was agreed that the annual general meeting should be held on Thursday, March 30th, at 6.30 p.m., at the Royal Automobile Club.

Business to be transacted at the annual general meeting will be: The election of a president and vice-presidents, the receipt of the annual report of the Union for the past year, the receipt of the balance-sheet of the Union for the past year, the consideration of any recommendations for the advancement of the sport and pastime of motor cycling. Such recommendations must be received by the Secretary not less than twenty-eight days before the meeting, and must be signed by at least twenty-five members.

### Pleasure Motoring and Local Taxation.

Inland Revenue licences are taken out in January, and before the end of the following month comes the recommendation that private motorists should lay up their cars and cycles. This is probably a mere coincidence, but many of the less affluent riders would be glad to know whether, in the event of their machines being put on one side, the tax would be returned to them.

### More Ford Stories.

The Ford yarns published in our issue of last week have aroused the greatest interest. The following two have been received since:

Why is a Ford like the first-born of a lady of means? Because it has a new rattle every day.

The Ford Co. issued a certain number of American cent tokens, some of these having on the one side the letters F.O.R.D. A new car was offered to the first person returning a complete set of these tokens to the Ford Co.'s head office. One man was successful, and made his application for the car. On arriving at the works he was requested to go into the showroom to pick out his car and then see the manager. After some little time he returned to the office, and on the manager asking if he had decided which one to have, he replied, "I think I'll have my four cents back, thanks."

### Empire Trade after the War.

Speaking in the Canadian House of Commons at Ottawa on February 17th Sir George Foster, Minister of Trade and Commerce, said that one of the most important lessons of the war was the need for the co-ordination and co-operation of all parts of the British Empire. The first thing that would take place after the war would be the revision of the treaties and tariffs which governed trade. The Allies would be disposed to unite their economic forces in order to protect their own peoples and the British Empire would get itself together.

### Another Despatch Rider Killed.

Cpl. H. E. Govett, of Rugby, a motor cyclist despatch rider in the Royal Engineers, who was killed in the Dardanelles on December 19th last, will be remembered by many of our readers, as he was a frequent attender of important motor cycle competitions, and usually occupied the seat of J. R. Haswell's sidecar when that rider set up his notable performances. Govett, too, was the passenger in the Singer light car when Ivan B. Hart-Davies set up the record of 34h. 39m. from John-o-Groat's to Land's End (equalling an average speed of 25.57 m.p.h.) during the last week of June, 1913. Govett was a member of the Coventry and Warwickshire Motor Club.

### Novel Non-stop Engine Run.

A Harley Davidson motor cycle with the rear wheel jacked up has run continuously in the showroom of a Phoenix U.S.A. dealer for eight days and twenty-two hours. During this time the machine, according to speedometer, covered 4,310½ miles.

### The Indian Again.

Following Baker's records in Victoria comes a cablegram from Melbourne stating that on February 21st Jack Booth, on a 7 h.p. Indian, broke the world's half-mile road record, the time being 18½s. This works out at an average speed of 95.74 m.p.h., and it should be noted that it was made over a level road with no wind. The highest speed ever accomplished on a motor cycle at Brooklands was that of just over 92 m.p.h., by S. George on an eight-valve Indian.

### A 2½ h.p. and Sidecar up Nailsworth.

The recent hill-climbing test up Nailsworth Ladder seems to have set the ball rolling. Not only has this notorious hill been climbed by a 3½ h.p. Sunbeam and sidecar, but we now understand that Mr. Jack Phillips, who will be remembered as a most successful competition rider of Douglas machines, has been successful at the fourth attempt in making an absolutely clean ascent with a 2½ h.p. Douglas and sidecar carrying a ten-stone passenger



MOTOR CYCLISTS, ATTACHED TO AN OVERSEAS DIVISION, WHO HAVE JUST COMPLETED THEIR TRAINING AT WITLEY CAMP.

- (1) Returning to camp after a hard day on the road. (2) The R.E. officer in charge of the motor cyclists, who uses a 10 h.p. Singer light car.  
(3) Going into the garage. (4) Outside the garage door.



# MILITARY NOTES.

More News from Salonika. Army Wireless Sidecar Outfits.

## A NEW ZEALANDER FOR THE M.M.G.S.

A READER named Robert Lloyd, of Ngatimote, N.Z., recently made application to the Editor for enlistment in the Motor Machine Gun Service, and enclosed money order for £1 so that a cablegram might be sent to him. We have been glad to despatch a message accepting Lloyd, who has had seven years' experience, during which period he has owned fourteen different makes of machines.

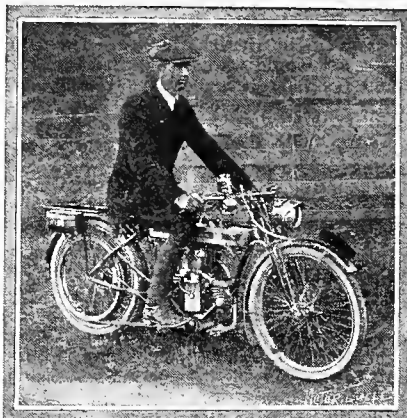
## FORD YARNS FROM MALTA.

P.O. G. L. ROSSITER, of the R.N. Armoured Car Division, sends us two Ford stories. He writes from Malta as follows:

"In some extraordinary manner *The Motor Cycle* has reached me with persistent regularity during the past ten months, in France, Egypt, Lemnos and Imbros Isles, Suvla Bay, and now here in Malta, reducing the boredom of convalescence to a minimum. I see in the latest copy to hand you ask for Ford stories. Are the following new in England? Shortly after the outbreak of war the Germans found that their stock of Iron Crosses was far too large, and for economical reasons they decided to sell a quantity as scrap metal. Accordingly a large crate full of crosses was despatched to the Ford Co., who received it, but not with a letter of explanation. They replied as follows: 'Dear Sir,—This is the worst smash we have ever seen. A new car is being forwarded at once.'

"And this one: A motor cyclist came across a man seated by the roadside, and a Ford car on the top of a wall. He stopped and enquired what was the trouble. 'Well,' replied the motorist, 'I was trying to start the engine, when the car came off the handle and landed up there.'"

A. J. Palmer, late of the staff of Iliffe and Sons Ltd., has been promoted from second-lieutenant to lieutenant in the Motor Machine Gun Service.



Robert Lloyd, of Nelson, N.Z., the latest overseas candidate for service in the M.M.G.S.

## WITH THE SALONIKA FORCES.

WE are able to supplement the news of despatch riders with the Salonika Forces, published on page 74 of our last issue, with some further details that have come to hand in a letter from Cpl. John C. Coney. The photographs reproduced herewith, for which we are indebted to Coney, were taken during the advance into Serbia at the end of last year. Unfortunately, they do not show the appalling "roads" the despatch riders had to travel along, but from what Coney and other readers in that part of the world have told us, the roads behind the firing line in France must be as billiard tables compared with what our men have to contend with in Macedonia. Douglas and Triumph machines covered themselves with glory by standing up under such terrible conditions. Cpl. Coney believes there were only three riders who completed the return journey by road, and

they were mounted on Triumphs. Coney was one of the three, and he and his machine have seen ten months' continuous service. On the return journey to Salonika they had to entrain for a portion of the way owing to the heavy rains. Before this they had crossed successfully many rivers, but the worst bugbear of the "road" was the number of big boulders, which caused several broken crank cases. Coney and his comrades are now back at Salonika, where, excepting the numerous big pot-holes and broken metal, riding is not so bad.

## DESPATCH RIDERS IN EGYPT.

CPL. W. HULLAH, a despatch rider with the British Forces in Egypt, in the course of a letter we have received from him speaks very highly of the machines in his section. Although "road" conditions are totally different in Egypt from those existing in either France or Macedonia, yet in their own particular way the former provide ample testing of both riders and machine. Deep sand often has to be ridden through, but it does not stop his Triumph, and the handle-bar-controlled clutch is particularly appreciated.

## WIRELESS SIDECAR OUTFITS.

THE De Forest Radio Telephone and Telegraph Co., of New York, has now in operation a number of Indian sidecarriers which are fitted up as travelling wireless stations. The machines go in pairs—one carries the wireless outfit and the other serves to carry poles, wires, tent and blankets, and other paraphernalia for camping. Thus each group of the service is independent of tall trees and houses, on which the field wireless formerly relied for temporary quarters. In one compartment of the wireless carrier is located a 5 h.p. twin-cylinder Indian engine for driving the electric generator. The outfits are finished in the U.S.A. Army olive drab. With the British forces field wireless outfits are carried on the backs of horses, the power to drive the generator being supplied by Douglas engines.



Despatch Riders Postill, Coney, and Robinson leaving the camp.



SOME DESPATCH RIDERS WITH THE SALONIKA FORCES.

Taken "up country" in December, 1915, the three men shown, riders

of Triumphs, are supposed to have been the only ones to ride their machines back to Salonika.



Cpl. John C. Coney and his Triumph after ten months continuous service. Observe handle-bars.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

### Patents.

Sir,—There are two patent notices in your issue 672, February 10th, which are closely related, both ideas having been used by the same firm previously.

I refer to Nos. 1,359 and 5,064.

No. 1,359 is almost identical to the old Rexette gear of 1905-6, designed by Fred Barnes (now of Zenith fame), and manufactured by the Rex Motor Co., Ltd., the principal difference being that the two-speed gear wheels are omitted in this new design.

The engine lubrication No. 5,064 is an adaptation of my design, which was adopted by the Rex Motor Co., Ltd., for their 1914 engines. I used and proved its success on the road during the latter part of 1913. I also adapted the idea to a two-stroke during 1914 for the same company.

It is strange, though nevertheless a fact, that two motor cycle manufacturing companies have taken out patents for this same idea since I introduced it in 1913.

H. SARGINSON.

### Pleasure Motoring.

Sir,—I have just been reading your article in regard to the National Organising Committee for War Savings, and felt I must write and ease my mind on the subject, as I feel very keenly about it. To begin with, my husband is fifty-two years of age, is a colliery blacksmith, and works six days a week, every Sunday morning, and sometimes all day. I am forty-six. We have been married eighteen years, have furnished and bought the house we live in, kept my husband's mother nine years until she died, and are the owners of a 4 h.p. combination, besides a nice nest egg in hand for a rainy day, also a goodly sum on Exchequer Bonds, to which I shall add whenever I can, and like the village blacksmith, we can—

"Look the whole world in the face  
For we owe not any man."

Before we got our machine we had push cycles, but I fell into ill health and had to give it up; but my doctor said I must have plenty of fresh air on account of bronchial asthma and heart trouble, and so we got the machine for that purpose.

Now, sir, do you think there is anybody that can honestly say we are riding for pleasure. No, sir; the Committee ought to go into some of the homes I see and get to know about the waste and extravagance among the working classes, for I know some who go to two picture halls in a night, besides riding in a 'bus to go there and back; and that is not the only thing. Now, in the eighteen years we have been married we have been twice to a picture hall and five times to a theatre. We like to put our money in something we can see, but not to be deprived of a health-giving run at the week-end whenever work allows us to do so.

J2595.

Sir,—I think my case may be of some interest, in view of the discussion on this subject.

I joined the Special Reserve as a subaltern within a week of the outbreak of war. After months of hard work in a remote part of this country I was sent abroad. I took part in the Battle of Ypres in April and May, and was eventually very seriously wounded in October.

I am now on sick leave, and shall be for several months. Afterwards I shall probably spend several months in England on light duty and home service before being fit to go abroad

again. While serving I had saved a certain sum from my pay; I had no other means; this has been added to a "wound gratuity."

I have therefore contributed over £100 to the War Loan, and with the remainder bought a 1916 4 h.p. machine—one turned out by a certain firm in excess of the requirements of our own and allied Governments.

I am undergoing daily medical treatment, but I wish to ride my cycle in the afternoons for pleasure—though, inasmuch as this will give me much fresh air, it will also help to cure me more quickly.

My maximum expenditure in petrol is not likely to be more than 7s. 6d. a week, of which nearly 3s. goes to the revenue.

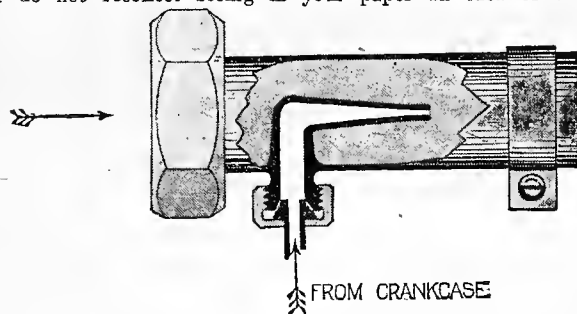
Surely neither this expenditure nor the actual buying of the machine can be condemned as very unpatriotic? At the same time I am debating whether my further savings, if any, should go to purchasing a sidecar to take out wounded friends and Tommies or to the War Loan.

I feel sure that there must be many of your readers in the same position as myself, and I trust that they will not be condemned by the somewhat merciless critics of the present day.

SUBALTERN.

### Forced Induction.

Sir,—I am submitting to you a sketch illustrating an idea for utilising the vaporised oil from the crank case release. I do not recollect seeing in your paper an idea of this



description, and I thought it might prove of interest to some of your readers.

In my opinion, it has the following advantages: It gives a forced induction, a better mixture than pure air, also assists in lubrication.

C. LINZELL.

B.E.F.

[The idea is not new; a similar contrivance was first used many years ago on Rex machines.—Ed.]

### Two-stroke Design.

Sir,—In reply to several correspondents who have adversely criticised my figures, may I be allowed to state that I did not in any way intend the figures 6–26 m.p.h. to represent the extreme limits of power of the Levis? I only used those figures to denote the speeds I usually travel at. A well-tuned Levis will run from 4 to 40 m.p.h. without four-stroking, but of course one could not expect to keep up the latter speed on a long journey.

I should also like to say that my experience of lightweight machines—including the Motosacoche—leads me entirely to

disagree with Mr. De Lissa in your issue of February 17th as to the superiority of the four-stroke in reliability. My present two-stroke is well on its third year without a single engine repair or stoppage on the road.

Thirdly, Mr. Martin has not had experience of the "Baby," or he would not put the weight at 140 lb.—90 lb. would be nearer (February 10th, 1916). ROLYAT.

Sir,—We note Mr. J. Martin finds the facts regarding the illusory nature of the two-stroke disease he sets out to cure unanswerable. That being so, it seems scarcely worth while worrying about the remedy, and he really must be joking when he suggests that forethought on *our* part can prevent petrol going stale in *his* crank case. As to the relation between compression and efficiency, he need only turn to any book on thermodynamics. The maximum possible efficiency of an internal combustion engine, and the standard by which actual performances are judged, is

$$1 - \left(\frac{1}{r}\right)^{\gamma-1} \quad \text{where } \gamma \text{ is } \frac{\text{Specific heat at constant pressure}}{\text{Specific heat at constant volume}}$$

and  $r$  is the compression ratio. Thus, when this increases, the possible efficiency increases also (the practical limitations on *exceptionally* high compressions are not the points at issue).

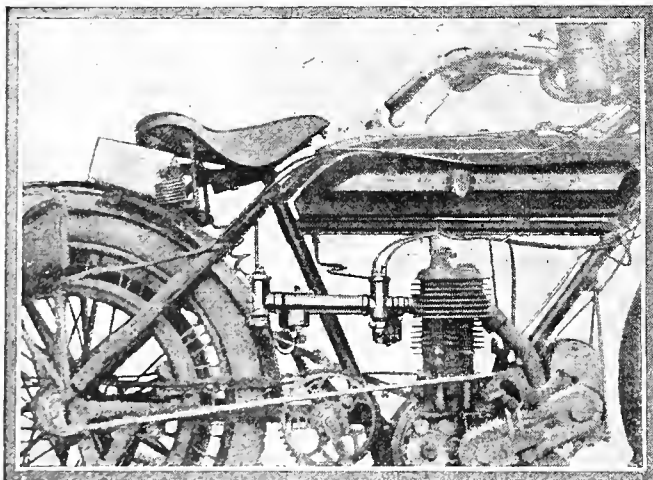
We should be the last to claim that release-valves, when driving, are more than a convenience, enabling the rider to slacken speed and afterwards get quick acceleration. Mechanical ones, however complicated, will have just the same limitations, and it is not a practicable proposition to abolish the throttle.

BIRMINGHAM LIGHT MACHINE CO.  
H. R. HUGHES.

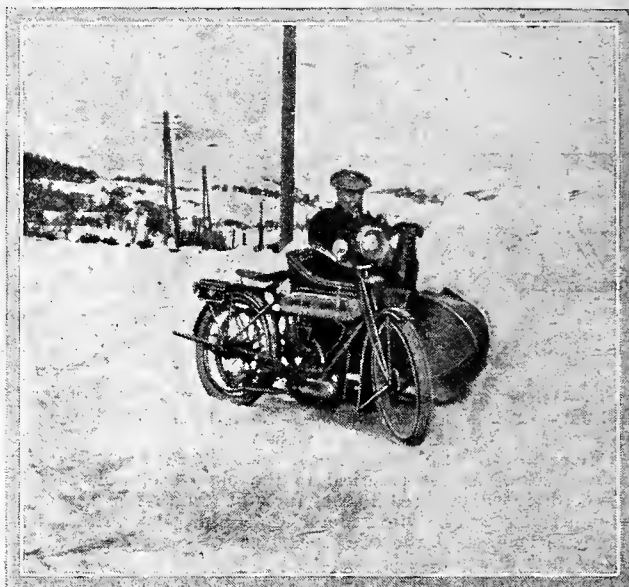
#### Paraffin as a Fuel.

Sir,—I have read the article on the above by Mr. D. R. Edwardes-Ker, and am enclosing you a rough photograph of an ingenious idea for running on paraffin. The small tank under the saddle holds the petrol, and the usual petrol tank contains the paraffin. The carburettor nearest the engine is connected up to the paraffin tank and the back one to the petrol tank. The petrol carburettor has an air lever only, while the paraffin one has the usual two levers. The paraffin jet is rather larger than the usual petrol jet, and is fitted with a coil of thin wire over the top (to break up the paraffin as sucked through the jet). To start up the petrol tap is turned on and both the front carburettor levers are opened, and the back lever (air) is closed. As soon as the engine is running the paraffin tap is turned on and petrol off, back air lever opened, and front carburettor used in the usual way. Mr. G. H. B. Clarke, of Broughton, Hants., has to be credited with this idea. He has used this two-carburettor system on his B.S.A. for well over 1,000 miles now with good result. We have recently taken the engine down, and found it to be in splendid order.

H. S. WALLIS.



Location of two carburettors for running on paraffin. See letter on this page from Mr H. S. Wallis.



A Scottish snowdrift. See letter on this page from Mr. C. J. Anderson.

#### Sidecarring under Wintry Conditions.

Sir,—Enclosed is a picture taken on the road between Balmoral Castle and Braemar, and locally known as "The Street of Monaltrie." In places the drifts are quite five feet deep, as shown in the photograph. In the distance is the steep ascent across to Donside, which may be familiar to many of your readers. The machine is a Triumph sidecar outfit. C. J. ANDERSON.

#### Spring Frame Design.

Sir,—It is quite a relief to me to know that the correct principles of design of spring frames are understood.

The very lucid article you published in your issue of February 3rd expresses very ably the sentiments that have been "rising half-formed in my breast" ever since the hundred and one brain waves on this subject first began appearing in your columns.

I have absolutely nothing to disagree with in the article, and would like to say I consider the strains described in fig. 2 by far the most serious—and in most, if not all, systems now on the market, no means are provided to counteract these strains adequately.

Another thing I think it is important to arrange for is this: that the amplitude of movement of the rear wheel should be as nearly as possible equal to that of the front wheel, otherwise the machine will feel as if it were rotating bodily in the fore and aft vertical plane about the front wheel (if the amplitude of springing of the rear wheel is greater than that of the front). I have found this fact out from actual experiments. C.W.P.

#### Foot Operation for Change Speed Gear.

Sir,—As regards the article in *The Motor Cycle* of February 10th showing an alteration to our change-speed lever, we may say that if the sketch is drawn from the actual article some considerable alteration must have been carried out to the small levers, which we think hardly possible under war conditions. If the alterations have not been carried out, the gear movement will not be correct, and full engagement will not be obtained in the middle gear.

If the long lever only is bent edgewise without disturbing the quadrant a very satisfactory gear change is assured, such as we think is hardly possible with any other type of gear. As a matter of fact, the writer personally often changes gear either with his knee or his foot with the lever in the orthodox position, and fully intends experimenting with a more horizontal type of lever to get the same result as that achieved by the originators of the sketch shown in your article. STURMEY-ARCHER GEARS, LTD.

## Tuning and Adjustment of Two-strokes.

**A**LTHOUGH the small single-cylinder two-stroke engine is so simple it is this very simplicity which gave rise to the various controversies as to the methods of tuning and adjustment to obtain the best results. Naturally, the different designs of engines have different peculiarities, and the makers of the engines should know best the methods most suitable for their own particular machine. We were, therefore, interested in a booklet, issued by the Villiers Engineering Co., Wolverhampton, entitled "How to Use and Adjust the Villiers Two-stroke Engine."

This make of engine is found on many two-stroke machines, and, in addition, the book contains much information which would be equally useful to owners of other makes. For these reasons we consider that the following extracts will be of general interest:

### Carburettor Jets.

It is difficult to make any hard and fast rule as to the size of jet; a general mistake, however, appears to be to use too large a one. Always use the smallest jet that will give regular running. This will keep the engine cool and save petrol.

As a general rule a No. 28 jet will be found the best, but for special conditions other jets may be required.

### Carburettor Adjustment.

See that the carburettor is fixed in a vertical position, otherwise the petrol level will not be correct. The float chamber should be in front of the jet.

Cables must be adjusted after the carburettor is fitted to the motor cycle as a bend or two in the cable alters the adjustment.

Put carburettor levers in the closed position, and then adjust until all slackness in the cable is taken up.

All sharp bends in the cable must be avoided; otherwise the inner cable will work stiff.

See that the connection between the carburettor and the cylinder is absolutely air-tight so as to ensure satisfactory running at low speeds.

### Misfiring.

This is usually caused through dirt in the gauze of the carburettor below the float chamber, or faulty ignition.

### Uneven Firing.

This is nearly always due to carburation. Only experience will teach the rider the best position for his levers. A special instruction booklet is supplied with each different make of carburettor.

### To Start.

Fill oil compartment in tank with good motor cycle oil, such as Price's

Huile de Luxe, or Wakefield's summer grade.

Fill petrol tank, using a funnel fitted with fine wire gauze to prevent any water or dirt getting into the tank.

Open throttle lever half-way and keep air or top lever closed.

Advance ignition slightly and hold up compression release lever.

Flood carburettor, push machine along a few yards, then suddenly drop compression lever, and the engine will start.

Immediately engine is started, release oil plunger and unscrew regulator to sight feed, so as to allow the oil to run freely.

When engine begins to smoke, screw down regulator until the oil spots about 36 drops per minute.

The exhaust gases should give out of the silencers a slight blue vapour.

When climbing hills use more oil by unscrewing the oil regulator.

Just before stopping engine turn off oil, or it will flood the carburettor and cause difficulty when restarting.

When machine is not in use be sure and turn off petrol tap.

Be sure and see the oil is flowing when the machine is running.

When the machine is new use plenty of oil.

### To Remove Flywheel.

If at any time the flywheel has to be removed, care must be exercised in replacing it.

### OVERSEAS MOTOR CYCLIST ON SERVICE.



Cpl. Maker, R.E., is another keen motor cyclist who came from overseas to serve his native country. He was resident in Calcutta at the outbreak of war, being a member of the local motor cycle club, and is now despatch riding on a Triumph in France.

See that the taper in the shaft and the hole in the flywheel are perfectly clean.

That there is no dirt in the keyway, which will project the key up above its proper height.

That the key binds only on the sides, and never on the top.

Then screw the locking nut up as tightly as possible.

After, with a piece of brass or lead, jar the flywheel up the taper and follow up by further screwing up the nut.

### Exhaust Box.

Always see that the exhaust gases are coming out of the tail pipe from the silencers.

### Adjusting Magneto Chain.

Should this chain stretch there will be a rattle in the aluminium case, and the magneto will fire irregularly. To adjust—

Remove front of aluminium chain cover. Unscrew the bolts that fasten the magneto base plates to the front engine plates on both sides.

Push the magneto forward until the chain is properly adjusted, and then screw up bolts.

### Timing of Magneto.

With the magneto fully retarded the contact points should break exactly on the top centre. To find top centre take out sparking plug, insert small piece of wire and turn engine round slowly until you feel the piston reach the top of the stroke. Hold engine and magneto firmly in these positions and tighten magneto chain wheel on taper by screwing up set screw (right-hand thread).

### Release Valve Lever at the Top of Cylinder\*

The Bowden cable needs to be carefully adjusted so that it gives the full motion for both opening and closing.

### To Remake Joints.

Clean off old seccotine from the surface of the joints with hot water. Cut brown paper the pattern of the machined surface of the joint. Coat each side of the paper cutting with seccotine. Place between the joint to be made and screw the nuts up tightly. Leave fifteen minutes to set and then trim off edges.

### What not to do.

Don't take the engine to pieces for the fun of the thing. More engines are spoilt by tampering with them than by regular running. Only proper motor cycle mechanics should take this engine apart.

Don't under any circumstances take the crankshaft apart. If there is anything wrong with that it should be returned to the makers, who have special facilities for dealing with it.





A selection of questions of general interest received from readers and the replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" on the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Some General Queries.

? (1.) What is wrong with the plug when it sparks between the insulator and the body instead of at the points; can this be cured? (2.) Should the four holes which are drilled in the balance weights of the crank (engine with outside flywheel) be all filled with lead, as only three of mine are filled, one of these being slack? I was thinking the other one might have worked out. Which is the more suitable, lead or white metal, for filling them up? (3.) Would you advise me when coasting down hills to use free engine? (4.) Should the exhaust or the inlet valve spring be the stronger on a 2 h.p. four-stroke? The inlet valve stem is badly worn. How can I prevent this wearing. The valve seat is worn oval owing to the valve always going to one side while lifting. How can I true up this? (5.) My machine is fitted with a pump lubrication. There is no tap on the pipe to the crank case. Is the oil liable to run down into the crank case while it is standing? (6.) What is the best position in which to set a fixed ignition magneto?—R.P.

(1.) The reason that the plug sparks between the electrode and the body instead of between the points is that a short circuit is taking place. This may only be due to too much oil, in which case thoroughly washing the plug in petrol will cure it. On the other hand, it may be due to a faulty insulator, when the only cure is a new plug. (2.) It is usual when the balance weights are filled to fill all the holes drilled; but in this case the one hole may be left empty to secure the correct balance. A special lead alloy is usually used. (3.) No; it is not advisable to use neutral position for coasting down hills, as it is difficult to engage the gear again, and is liable to damage the dogs. (4.) The exhaust valve spring should be stronger than the inlet. We do not know of any cure for the valve stem wearing. You will have to get the seating trued up by a special tool made for the purpose. We would advise you to take the seating to a reliable firm of engineers. (5.) The pump is probably fitted with a ball valve to prevent the oil flowing into the crank case when the machine is standing. So long as this valve is in order you will have no trouble from this source. (6.) It is best to have a variable ignition if possible, but if fixed ignition is fitted have it as far advanced as the engine will take it without knocking. It is impossible to give any definite position for this, as every engine will vary to some extent.

### Cubic Capacity.

? I am somewhat puzzled how to find the capacity of an internal combustion engine cylinder as specified by the makers, and would be very much obliged if you could enlighten me on the following questions: (1.) Does c.c. mean the whole of the space in the cylinder, including the combustion chamber, as obtains when the piston is at the bottom of its stroke, or only the amount of space displaced by the piston in working? (2.) If the whole of the space is meant, how is that in the combustion chamber calculated when it contains irregularly-shaped pockets, as in a side-by-side valve engine? (3.) Would it be feasible to find the c.c. by filling the cylinder up to the correct point with water and then transferring to another vessel of regular shape in which it could be measured? (4.) What is the usual amount of space allowed for the combustion chamber, in proportion to the whole of the cylinder space?—W.H.

(1.) C.c. means the outswept volume of the piston only, and does not include the combustion space. (2.) This space is not included. (3.) No, this would not give you the c.c. It can be obtained from the following formula:

$$D^2 \times S \times N \times .7854.$$

D = Bore.

S = Stroke.

N = Number of cylinders.

(4.) This depends entirely upon the particular design of engine, and the compression ratio decided on, which on most engines is roughly 4 to 1. Thus in a 500 c.c. engine the compression space will equal 500 divided by 3.

### Long or Short Wheelbase and Skidding.

? Would you kindly inform me on the following points? Assuming that two machines are identical in every respect (viz., gears, horse-power, even torque, distribution of weight, tyres and wheels, etc.), but that one has a longer wheelbase than the other, also one is heavier than the other, which machine would be the more liable to skid on greasy roads, the shorter or the longer wheelbase, the lighter or the heavier model?—A.G.M.

We think the general distribution of the weight affects skidding more than the actual length of the machines. Either a very long machine or a very short one will be almost equally liable to skid, although in all probability the shorter one would be more easily corrected, but the longer one would not be as likely to skid in the first instance. The light machine would probably skid more readily than a heavy one, but when once a skid has commenced, there is no doubt it is more easily rectified on a light machine than on a heavy one. The weight of both machine and rider should be distributed as nearly as possible equally

upon the two wheels in order to overcome to the greatest extent the tendency to skid. If all the weight is at the back, or all in front, it will tend to cause undue skidding. The liability to skid on the various types of machines depends to a very great extent on the type of road surface; for instance, a very rutty road would undoubtedly affect a light machine to a greater extent than a heavy one, while a steep, greasy, highly-cambered road would possibly, under certain circumstances, cause a heavy one to skid more readily.



Miss Dorothy Hazlewood, mounted on her 5-6 h.p. Hazlewood combination. The photograph was taken during a visit to Edge Hills. Miss Hazlewood is the daughter of Mr. James Hazlewood, a director of the firm producing the motor cycle of that name.

**Overheating.**



(1.) I have a 5 h.p. twin Rex, a.o.i.v. It runs well for four or five miles, but then seems to overheat, and will not run well again until cool. I am using single-point plugs; B. and B. carburettor with 32 jet; timing appears to be correct. Could you tell me the likely cause of this trouble? (2.) How many miles do you recommend me to run per pump of oil?—F.L.

(1.) The probable cause of overheating may be due to any of the following points: (a.) Too rich a mixture. Try a slightly smaller jet. (b.) Inlet springs too weak, and allowing too great an opening. Try fitting washers on valve stem to reduce valve opening to about  $\frac{3}{32}$  in. (c.) Insufficient lift on exhaust valves, owing either to too great a clearance between tappet and valve, or owing to the cam having worn. (d.) A choked silencer outlet. (e.) Insufficient lubrication. (f.) Incorrect timing. Exhaust valves should not close before piston reaches top of exhaust stroke. (2.) It will usually be found that half a pumpful of oil every four miles will be about correct.

**Misfiring at Speed.**



I have an old  $2\frac{1}{2}$  h.p. single-cylinder, with automatic inlet valve, Hellesen ignition, and B. and B. carburettor. It starts fairly easily with the spark occurring dead on the top of the stroke, and it runs all right, though not very fast. As soon as I advance the spark at all, however, the machine will gather speed for about ten yards and then misfire for a few strokes till it has slowed down a bit. Then it will fire regularly again for another ten yards and so on. In addition it will not climb any hill at all steep. No. 30 jet is fitted, and I cannot give much air, but with No. 32 jet it overheats badly and stops every two or three miles, and I have to wait till it cools down. The piston and rings are a good fit, and the cylinder is perfectly true, tested by micrometer. I have fitted a new exhaust valve, and the inlet valve fits its seat quite truly.—A.B.

We should think your trouble is due to a faulty contact breaker. With accumulator or battery ignition this is nearly always an unreliable point. You should make sure the spring which separates the points is quite strong, and that the points meet quite truly, and are made of either pure platinum or one of the special metals sold for this purpose. You ought to be able to give a certain amount of air after the engine has once started. Possibly the cause of overheating when a larger jet is fitted is insufficient lift of the exhaust valve, or a choked silencer. Too great a lift on the automatic inlet valve will also cause overheating, in which case the lift should be reduced by fitting washers under the spring cap till the valve only opens  $\frac{3}{32}$  in.

**Brakes Legally Required**



I have just purchased a four-cylinder F.N. motor cycle. It is fitted with an expanding brake on the back wheel; it has no front brake, and the seller assures me that it is absolutely unnecessary owing to the strength of the back one. I am under the impression that it is necessary by law to have two brakes, one back and one front.—G.N.M.

It is legally necessary in this country to have two independent brakes on a motor cycle, but it is not necessary that these should be fitted one to each wheel. They are often fitted both on the rear wheel, but the fact of one brake being very powerful does not, as the seller tells you, free you from the obligation of fitting a second brake.

**Sluggish Running.**



I have an old Quadrant motor,  $3\frac{1}{2}$  h.p., with valves side by side, magneto ignition. The exhaust valve is lifted by a sliding T-piece, but the inlet valve is sucked open. The T-piece does not touch the inlet valve, nor was it, apparently intended to do so, as there are no timing wheels for the purpose. When I bought this machine some six months ago it went well, but a friend of mine ran into a post with it and broke the forks; so I took the engine out and, while the frame was being repaired, fitted a set of new piston rings; otherwise, except grinding in valves, I did not interfere with engine. I can start the machine up, and it runs slowly for about a minute, and then it stops. It will not speed up, no matter what is done with the levers, and will not take air. Carburettor (B. and B.) is in good order, and clean; compression good. Exhaust valve lifts about  $\frac{1}{16}$  in. Inlet will open as much as  $\frac{1}{16}$  in. when lifted by hand. Exhaust valve closes when piston is on top dead centre. Would keeping machine in damp shed cause this trouble?—BUCK.

As there is no cam or provision for a second tappet, your valve is evidently intended to be worked automatically, though it is very unusual to fit a.o.i. valves side by side. The inlet is usually fitted above the exhaust. We should think the reason for your machine refusing to start or run is that there is an air leak somewhere between the engine and carburettor. You should bind all doubtful parts with adhesive tape. If the machine has been kept in the damp, you should make sure the contact breaker bell crank is free in its bearing, as the fibre bush sometimes swells with the damp and causes trouble. The fact that your machine will not take any extra air points to carburettor trouble and too weak a mixture. A magneto will never spark so well when retarded as when fully advanced. This is due to the fact that

the armature is arranged to be just breaking the fields while the contact breaker points are separating with the ignition fully advanced, and in this setting the hottest spark is obtained. Your timing appears to be about right.

**Loss of Power.**



I have lately acquired a  $3\frac{1}{2}$  h.p. Triumph, and during the last week it has lost power considerably. The compression is fair, and the belt sufficiently taut. The engine was cleaned out only a short time ago, and the plug is quite clean. When I had it first, about three weeks ago, I could take any hill around here (Bournemouth) with ease on top. I now find a great difficulty in getting it up some on bottom. The machine is a last year's model, and is otherwise in fine running order.—G.E.T.

The cause of your machine falling off in power may be due to many things. The most common are: Partially choked jet or carburettor passages, dirty engine, piston rings gummed up with carbon deposit, valve springs too weak, too great a clearance between the tappets and the valves, or choked silencer causing back pressure. Be sure to give sufficient oil.

**EXPERIENCES WANTED.**

"L.G.R." (Narberth).—Grado multi pulley for use on Triumph.

"J.A.S.W." (Parkhill).—7.9 h.p. 1915 Harley-Davidson. Reliability, efficiency, and speed.

"R.M.C." (Stirling).— $4\frac{1}{2}$  h.p. B.S.A. models K and H. Consumption, reliability and efficiency.

"J.S." (Leeds).—1912 P. and M. Also Auto-wheel. Reliability, consumption, and speed.

"L.M.R." (London).— $2\frac{1}{2}$  h.p. Clyno two-speed. Speed, consumption, flexibility, and durability.

"L.W." (Manchester).—Norton big 4 h.p. combination. Reliability, consumption, power, and ease of control in traffic.

"E.M." (Aldershot).—T.T. Norton or T.T. Drough with Philipson pulley and sporting sidecar. Hill-climbing (22 stone up) and consumption.

**RECOMMENDED ROUTES.**

**BRISTOL TO GRANTHAM.—E.M.**

Bristol, Gloucester, Cheltenham, Teddington, Broadway, Weston-sub-Edge, Stratford-on-Avon, Warwick, Leamington, Rugby, Lutterworth, Leicester, Melton Mowbray, Waltham, Grantham.

**LEICESTER TO CHICHESTER.—G.P.**

Leicester, Lutterworth, Rugby, Dunchurch, Southam, Banbury, Deddington, Oxford, Wallingford, Pangbourne, Bath Road, Aldermaston, Basingstoke, Alton, Petersfield, Harting, Chichester.

**PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.**

In view of the decision of the Government to limit the import of material for the manufacture of paper it is imperative that every possible step should be taken to avoid waste of paper in any form. It has been the custom in the past for newsagents to order a certain number of papers for chance sales, and these copies if unsold become what are known as "returns"; in other words, waste copies.

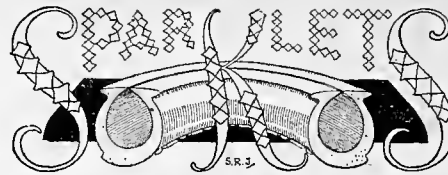
In the case of "THE MOTOR CYCLE" the percentage of returned unsold copies has been remarkably low, but in order to conserve the supply of paper in future it is desirable that the waste of copies, ordered to accommodate occasional purchasers, shall as far as possible be eliminated.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in this matter by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

## Average Prices OF Second-hand Machines.

**W**E give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted, otherwise the last average is given.

Make.	Year.	H.P.	Average Latest for weekly last average week, obtainable
A.J.S. ....	1915 6	3-sp. sidecar ..	£95
" .....	1914 6	3-sp. sidecar ..	£68
" .....	1913 6	3-sp. sidecar ..	£48
" .....	1915 2 1/2	2-speed .....	£50
Allon .....	1915 2 1/2	2-speed .....	£35
Ariel .....	1914 3 1/2	3-sp. sidecar ..	£53
" .....	1913 3 1/2	3-sp. sidecar ..	£44
Bradbury ..	1914 6	3-sp. sidecar ..	£63
" .....	1914 4	3-sp. sidecar ..	£47
B.S.A. ....	1915 4 1/2	3-sp. sidecar ..	£72
" .....	1914 4 1/2	3-sp. sidecar ..	£51
" .....	1913 4 1/2	3-sp. sidecar ..	£44
" .....	1915 4 1/2	3-speed .....	£47
" .....	1913 3 1/2	2-speed .....	£32
Calhorne ..	1915 2 1/2	2-speed .....	£27
" .....	1914 2	2-speed .....	£16
Clyno .....	1914 6	3-sp. sidecar ..	£66
" .....	1913 6	3-sp. sidecar ..	£50
Douglas ..	1915 2 1/2	3-speed .....	£46
" .....	1915 2 1/2	2-speed .....	£43
" .....	1914 2 1/2	2-sp. kick start	£41
" .....	1914 2 1/2	2-speed .....	£35
" .....	1914 2 1/2	2-sp. T.T. ....	£38
" .....	1913 2 1/2	2-sp. kick start	£32
" .....	1913 2 1/2	2-sp. T.T. ....	£32
" .....	1913 2 1/2	2-speed .....	£29
Enfield ....	1915 6	2-sp. sidecar ..	£72
" .....	1914 6	2-sp. sidecar ..	£63
" .....	1913 6	2-sp. sidecar ..	£47
" .....	1913 6	2-speed .....	£39
" .....	1914 3	2-speed .....	£33
A. Excelsior	1914 7	2-sp. sidecar ..	£55
H.-Davidson	1915 7	3-sp. sidecar ..	£79
Indian .....	1915 7	3-sp. sidecar ..	£74
" .....	1915 7	3-speed .....	£59
" .....	1914 7	2-sp. sidecar ..	£55
" .....	1914 7	2-speed .....	£44
" .....	1914 7	T.T. free engine	£44
" .....	1915 5	3-sp. sidecar ..	£69
" .....	1915 5	3-speed .....	£49
James .....	1915 4 1/2	3-sp. sidecar ..	£66
Lea-Francis	1915 3 1/2	3-speed .....	£63
Levis .....	1915 2 1/2	de luxe .....	£37
" .....	1915	Popular .....	£26
Matchless ..	1915 8	3-sp. sidecar ..	£80
" .....	1914 8	2-sp. sidecar ..	£70
" .....	1913 8	2-sp. sidecar ..	£50
New Hudson	1915 6	3-sp. sidecar ..	£61
" .....	1915 2 1/2	2-speed .....	£25
New Imperial	1915 2 1/2	2-speed .....	£20
" .....	1914 2 1/2	2-speed .....	£25
O.K. ....	1915 2 1/2	2-speed .....	£30
" .....	1914 2	2-speed .....	£21
P. & M. ....	1914 3 1/2	2-sp. sidecar ..	£50
" .....	1913 3 1/2	2-sp. sidecar ..	£43
" .....	1913 3 1/2	2-speed .....	£40
Premier ....	1914 3 1/2	3-sp. sidecar ..	£48
" .....	1913 3 1/2	2-sp. sidecar ..	£32
Quadrant ..	1915 4 1/2	3-sp. sidecar ..	£60
Rex .....	1914 6	2-sp. sidecar ..	£48
Rover .....	1915 3 1/2	3-sp. sidecar ..	£57
" .....	1914 3 1/2	3-sp. sidecar ..	£47
" .....	1913 3 1/2	3-sp. sidecar ..	£40
" .....	1913 3 1/2	3-speed .....	£33
Rudge .....	1915 5-6	multi sidecar ..	£41
" .....	1914 3 1/2	multi .....	£47
" .....	1915 3 1/2	multi .....	£36
" .....	1911 3 1/2	multi .....	£28
" .....	1913 3 1/2	multi .....	£28
Scott .....	1914 3 1/2	2-sp. sidecar ..	£49
" .....	1913 3 1/2	2-sp. sidecar ..	£42
Sunbeam ....	1915 6	3-sp. sidecar ..	£66
" .....	1914 6	3-sp. sidecar ..	£80
" .....	1915 3 1/2	3-speed .....	£63
" .....	1914 3 1/2	3-speed .....	£52
Triumph ....	1914 4	3-sp. sidecar ..	£57
" .....	1914 4	3-speed .....	£43
" .....	1913 3 1/2	3-sp. sidecar ..	£48
" .....	1913 3 1/2	3-speed .....	£39
" .....	1915 2 1/2	2-stroke .....	£34
Williamson ..	1914 8	2-sp. sidecar ..	£64
" .....	1913 8	2-sp. sidecar ..	£55
Zenith .....	1914 8	Gratia sidecar	£67
" .....	1914 6	Gratia sidecar	£50



### The Tinol Soldering Outfits.

In our issue of February 17th "Road Rider" gave his experiences of the Tinol soldering outfit. The makers, Bi-Metals, Ltd., of 57, Lant Street, Southwark, S.E., point out that during the war they are unable to supply the small self-blowing lamp. The latter has been replaced with a brass mouth blow lamp, which is, it is stated, as effective, but not so convenient.

### The Wounded Soldiers' Outing.

The Harley-Davidson Motor Co., Ltd., who organised the sidecar outing for wounded soldiers reported in our last issue, has received a letter of appreciation from the Civil Administrator of the City of London Red Cross Hospital, Finsbury Square. In this it is stated that the men enjoyed themselves immensely, and the ride has done them all good.

### Review.

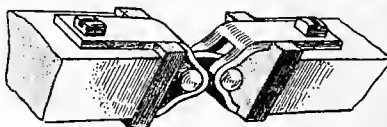
"The Largest Motor Cycle Business in the World." This is published by the Hendee Mfg. Company, and is a history of the Indian motor cycle from the days of its origin to the present time. It is a remarkably fine production, well illustrated and in no manner of ways a catalogue. The first Indian machine was finished in May, 1901, and it is a quaint-looking "beast" compared with the Powerplus of 1916. The cradle spring frame was first marketed in 1913—after eighteen months' testing—and its success is now well known.

### War Time Economy.

A motor cyclist, who had a frugal mind, purchased a John Bull belt, which had seen much service, from a friend. It was originally a 3-in. belt, but was worn down to 2-in., the core being exposed on one side. This belt is still running with the whole core exposed, but it is doing good service, and has never pulled away from the fastener, nor has it been shortened except by the removal of the spare link. The rubber which came off the bottom was very tough.

### To Protect Belt Ends.

A correspondent, Mr. J. Boston, sends us a sketch showing how he protects his belt by inserting leather blocks between the belt ends and the fastener. He says that he finds this device most useful on



J. Boston's belt end protectors.

a Rudge-Multi or other variably-gear machine. The sketch is self-explanatory, but it should be noted that the leather pieces are the same width as the belt, though they project slightly at the top and bottom.

### The Spur Sidecar.

The light sidecar referred to on page 80 of the Accessory and Sidecar Number of January 27th as the Spider is in reality known as the Spur. It is specially made for use with inexpensive light-weights, and is sold by Messrs. Grose, Ltd., 4, Old Jewry, E.C.

### The Institution of Automobile Engineers.

The next meeting of the Institution of Automobile Engineers will be held on March 8th, at the Royal Society of Arts, John Street, Adelphi, W.C., at 8 p.m., when Mr. J. Lawrence Hodgson, B.Sc., A.M.Inst.C.E., will read a paper entitled "The Fan Dynamometer."

### A New Appointment.

The sale managership of the motor cycle tyre department of Wood-Milne, Ltd., is now occupied by Mr. C. E. Kettle, until recently manager of the Liverpool Colmore Depot. In addition to his trade associations, Mr. Kettle is well-known in the North Midlands and the North by reason of his active connection with the Manchester and Liverpool clubs and the North-Western A.A.

### Catalogues Received.

"Forward Motor Accessories for 1916-17" is, as its name implies, a list of the sparking plugs, belt fasteners, and other articles made by the Forward Motor Co., of Summer Row, Birmingham.

Henderson sidecars for 1916 are well illustrated and described in a new catalogue we have received from the makers, whose works are at Cecil Square, Sheffield. There is a complete range of cane and coachwork bodies, sporting and double-seaters, etc.

We have received from Messrs. H. Taylor and Co., Ltd., 21a, Store Street, Tottenham Court Road, W.C., a tyre and driving belt list, which this firm will be happy to send to any reader on application. All the best-known makes of tyres are listed.

"Correct Lubrication." The Vacuum Oil Co., Ltd., Caxton House, Westminster, S.W. A useful publication, giving some valuable hints concerning the lubrication of motor vehicles, together with the prices of the various Vacuum oils and greases. Not the least interesting part of the booklet, from our point of view, is a list of motor cycles at the end, giving the qualities of oil recommended for each make and type.

J. Harrison and Sons, Ltd., 49-51, Constitution Hill, Birmingham. In this are listed various patterns of Britannic sidecars and coachbuilt sidecar bodies.

In last week's issue of *The Motor Cycle* we inadvertently gave the wrong address of Messrs. Bowden Wire, Ltd. This should be Victoria Road, Willesden, N.W.

## MOTOR CYCLES FOR SALE.

## Auto-Wheels.

- UTO-WHEEL**, very good, complete; £7/10.—Varcoe, Park View, St. Austell, Cornwall. [X3600]
- 1914 Auto-Wheel**, in splendid condition; £6/15.—Crow Bros., 190, High St., Guildford. [1876]
- UTO-WHEEL**, excellent condition; bargain, £10, or nearest offer.—Perry-Evans, Hillbutts, Wimbome. [X3152]
- UTO-WHEEL De Luxe**, £15/15, 26/3 monthly; a standard model, very little used, in splendid running order, £10.—Seen at 248, Bishopsgate, London. [1854]

## Barnsley.

- 31 h.p. Barnsley A.V. engine**, 1916 frame, stand, and 32 carrier, T.T. Regal back wheel (special), B.B. cert; nearest £3/10, offers.—Burdett, 19, Goyan Rd., Salfrey, Birningham. [1723]

## Bat.

- 6 h.p. 1912 Bat**, with accessories; £25.—Harvey, Hudson, and Co., South Woodford. [X3620]
- BAT 6 h.p.**, 8 h.p. in exceptional nice condition; £26.—Percy and Co., 337, Euston Rd., London. [1501]
- BAT-J.A.P. 8 h.p. Twin Combination**, with Canoelet sidecar; £25, offers; stamp, reply.—Ball, 49, High St., Kingston. [X3531]
- 8 h.p. Bat-Jap. cane sidecar**, splendid order, 2 spare tyres, tubes; £30.—Heedington, 19, Rostrevor Rd., Fulham, S.W. [1645]
- BAT-J.A.P. Combination**, 7-9 h.p. twin, mag., free engine, spring frame; any trial; £19/10.—1, Ebner St., Wandsworth. [X3664]
- BAT-J.A.P.**, 1914 1/2, 4 1/2 h.p., sporting twin, 2 speeds countershaft; any trial given; £35; must be sold at once.—Write, Bat, 18, Beechwood Av., Thornton Heath. [0782]
- BAT 8 h.p. Twin**, 1914, 3-speed countershaft, kick starter, T.T. model, speedometer, with or without sidecar; £38 and £42.—Percy and Co., 337, Euston Rd., London. [1502]
- 1913 Bat-Jap. 8 h.p.**, countershaft 2-speed, and specially made roomy underslung sidecar, Binks, excellent running order; £46.—W. Johnson, 67, Claremont Rd., Southampton. [1710]
- 1916 Bat and Sidecar**, 8 h.p. twin J.A.P., 3 speeds, luxuriously and completely equipped, run under 50 miles; cost £110, best offers.—Stone, Park Garage, Thornton Rd., Clapham Park. [1619]
- BAT**, 1915, brand new, 4-5 h.p. twin, sporting model No. 1, 2-speed countershaft gear, French grey finished; list price £60/7/6, special price for cash £55.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0552]

## Bradbury.

- 4 h.p. 2-speed Bradbury Combination**, perfect; bargain.—Hayman, Chipping Norton, Oxon. [X3439]
- 1913 Bradbury**, 2-speed, with Millford sidecar, and all accessories; £30.—Harvey, Hudson, and Co., South Woodford. [X3603]
- BRADBURY**, 1913, 4 h.p., 2 speeds, free engine, excellent condition, all accessories; £24.—Sergeant Kent, 7th Essex, Thetford. [X3704]
- BRADBURY**, 3 1/2 h.p., 3 speeds, clutch, etc., A1 condition, tyres, belt perfect; very cheap, £23, bargain.—Comore Depot, 62, High St., Leicester. [1616]
- BRADBURY 4 h.p. Combination**, 1912, 3-speed, and clutch, excellent running order; special bargain, 25 gus.—Newham, 223, Hammersmith Rd., W. [1798]
- BRADBURY Combination**, 4 h.p., 3-speed, free engine, tyres as new, 3 lamps, and generator, large booter and speedometer; being engaged R.N.A.S.; trial by appointment only; price £40.—Thomas Bird, 110, Fort Rd., Berrondsey. [1605]

## Brough.

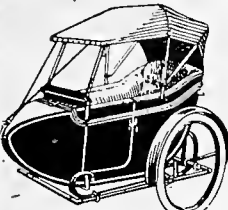
- BROUGH**, 1916: orders booked now for early delivery.—W. P. Edwards, Taunton. [X9968]

## B.S.A.

- SHREWSBURY Agent for B.S.A.**; delivery from stock.—J. C. Pickering. [X3445]
- B.S.A.**, 1916.—Both models in stock, or for immediate delivery.—Moss, Wem. [X3637]
- JULIAN'S**, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all B.S.A. models. [X2834]
- 1916 B.S.A. Model H**, 3-speed, all chain drive, with or without sidecar, just delivered.—Plastow, Grimsby. [X3615]
- B.S.A. and sidecar**, 1913, 2-speed belt drive and accessories; £30.—Colmore Depot, 31, Colmore Row, Birmingham. [X3501]
- B.S.A.**, 1916 models in stock, model H £64; B.S.A. No. 2 sidecar, £18/18.—Hucklebridge, 133, Sloane St., London, S.W. [X2935]
- 1916 B.S.A.**, model K; £62; three actually in stock; liberal exchange terms.—D. J. Shepherd and Co., Enfield Highway. [1687]
- B.S.A.**, 1913, 3 1/2 h.p., 2-speed, free engine, sound order; £27/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0597]
- B.S.A.**, 1914, 4 1/2 h.p., 3 speeds, clutch, and kick starter, chain drive, excellent condition; £48.—P. J. Evans, John Bright St., Birmingham. [1737]

## CORONET Sidecar Chassis

Is designed for long life, and has a wonderful reserve of stability, and is safe on greasy roads. Luggage carrier built into frame. Cannot shake loose, and is a boon when touring.



£10 15s.

Send for Illustrated Catalogue describing these well-known Sidecars.

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## Coronet Sidecars for Harley-Davidsons.

We make a special Sidecar, enamelled French grey to match, 28 x 3 in. tyre, apron to cover entire body, and four-point attachment ..... £13 10 Immediate Delivery.

## 7-9 h.p. HARLEY-DAVIDSON.

- 11J, electrically equipped, 3 speeds ..... £76 13  
11F, standard 3-speed model ..... £68 5

Cash Offers Wanted.

## NEW 1916 FORDS.

- 5-seater Touring Car ..... £135  
Delivery Van ..... £130

## Motor Cycles taken in Exchange.

## CASH OFFERS WANTED.

- 7-9 h.p. HARLEY-DAVIDSON, 3-sp., with coach Sidecar to match ..... £75 0  
6 h.p. A.J.S., 1915, lamps, horn, speedometer, Sidecar with screen ..... £78 0  
4 1/2 h.p. STAR, brand new high Single, 3-sp. countershaft gear, chain drive, kick starter; listed at £68 5s. .... £55 15  
3 1/2 h.p. LEA-FRANCIS, 1915, nearly new, 3-speed, kick starter, Hercules £13 13s. Sidecar, £5 ss. speedometer, £3 10s. lamp set; the whole cost £94 10s. .... £65 0  
2 1/2 h.p. WOLF, 1916, 2-stroke, 2-speed ..... £33 10  
4 h.p. WOLF, 1916, 3-stroke, chain drive ..... £49 15  
4 h.p. LEVIS, 1915, 3-stroke, 2-speed ..... £25 15  
3 1/2 h.p. HUMBER, 1914, 3-speed model, with Sidecar ..... £39 15  
3 1/2 h.p. LINCOLN-ELK, 1912 model ..... £15 15  
1913 HUMBERETTE Cycle Car, hood, screen, electric lamps, 3 speeds and reverse, good tyres ..... £55 0  
3 1/2 h.p. RUDGE, 1912, free-engine model ..... £19 15  
2 h.p. 1915 O.K., 2-speed, nearly new ..... £23 15  
3 1/2 h.p. SINGER, 1912, 3-speed model, with cane Sidecar ..... £25 0  
3 1/2 h.p. MINERVA, spring forks ..... £6 15  
3 h.p. HUMBER Tiger ..... £5 5  
1 1/2 h.p. WOLF, 1912, magneto ..... £9 10  
4 1/2 h.p. JAMES, 1913, 3-speed, with James coach Sidecar ..... £48 15  
1900 P. & M., 2-speed, and Sidecar ..... £18 15  
6 1/2 h.p. DE DION Light 2-seater Car ..... £15 15  
1915 MORGAN, 700 x 80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. .... £89 0  
3 1/2 h.p. PREMIER, 1916, 3-speed model with £13 10s. coach Sidecar, only run 100 miles ..... £68 15  
3 1/2 h.p. PREMIER, 1911, B.S.A. 2-speed ..... £19 15  
1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn, and lamps ..... £89 15

## MISCELLANEOUS.

- New Cane Body, open type; cost 35/- ..... 10 6  
New Complete Sidecar Chassis ..... 2 19 6  
New Cane Sidecar, enclosed body ..... 7 15 0  
Amac Carburettor off Enfield ..... 8 6  
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Brand New Waterproof Magnet ..... 3 10 0  
New 21/6 Glare Brass Electric Tail Lamp ..... 4 11  
1916 Binks Carburettors. Your old carburettor taken in exchange.  
New Torpedo Cane Sidecar ..... 7 10 0

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PORTLAND PLACE, SKIRCOAT ROAD,  
HALIFAX.

'Phone: 1062.

Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## B.S.A.

- B.S.A. 1914 Combination**, 3-speed countershaft, and coachbuilt sidecar, kick starter, in real good order; £55.—Percy and Co., 337, Euston Rd., London. [1493]
- B.S.A.**, 1916, 4 1/2 h.p., model K, just delivered, chain-cum-belt, 3 speeds, kick starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton. [X3715]
- B.S.A. Model H** £64, model K £62; actually in stock; generous deferred payments, liberal exchanges.—Lumb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1677]
- B.S.A.**, 1915, 4 1/2 h.p., chain drive, kick start, 3-speed, and clutch, all accessories, practically new; owner enlisting; £50, or near.—Duvy, The Priory, Caterham Valley, Surrey. [1704]
- 1915 B.S.A.**, 4 1/2 h.p., model K, complete with P. and H. head lamp set, Lucas rear lamp set, horn, speedometer, tools, and spares, guaranteed as new; £53.—White, 78a, Junction Rd., N. [1818]
- 1914 1/2 B.S.A.**, 3-speed countershaft, chain model, and B.S.A. No. 2 sidecar, with hood, wind screen, petrol carrier, head light, horn, speedometer, tail lamp, all in good order; £60 for the lot.—80, Cornhill Terrace, Leith. [X3149]
- B.S.A.**—New 1916 models from stock; inspection cordially invited. All-chain drive £64, chain-cum-belt transmission £62, fitted with B.S.A. countershaft gear, 2nd engine, and kick start; B.S.A. sidecars to fit, £16; gradual payments entertained; second-hand machines taken in exchange; generous allowance; tuition and free delivery. Buy from B.S.A. appointed agents. 'Phone: Holborn 5777. When dealing with Wauchope's, purchasers can deal with confidence.—Wauchope's, 9, Shoe Lane, Fleet St., London (just off Ludgate Circus). [X3610]

## Calthorpe.

- 1915 2 1/2 h.p. 2-stroke Calthorpe**, 2 speeds, complete; £25.—Cross, Jeweller, Rotherham. [X3673]
- SHREWSBURY Agent for Calthorpes**; all models in stock, or for early delivery.—J. C. Pickering. [X3446]
- CALTHORPE**—Latest 2-speed lightweight models in stock; cash or exchange.—Eagles and Co., High St., Acton, W. [X3716]
- CALTHORPE**, new latest pattern, 2-stroke, 2 1/2 h.p., with special mag.; £28/16.—Seen at 248, Bishopsgate, London. [1855]
- 1915 Calthorpe**, 2 1/2 h.p. J.A.P., Enfield 2-speed gear, first-class tyres, Pedley belt; £28/10.—Robinson's Garage, Green St., Cambridge. [16865]
- CALTHORPE**, 1915, J.A.P. engine, Enfield 2-speed, condition as new, horn, lamps, etc.; £28.—Owner, 255, High St., Houslow, Middlesex. [1667]
- CALTHORPE 2-stroke**, 2-speed, quite new, but slightly shop-soiled; special bargain, £27.—Wilkins, Simpson and Co., 11, Hammersmith Rd., London. [1664]
- 2 1/2 h.p. Calthorpe-Jap**, Enfield 2-speed, variable mag., 24 lamps, accessories, delivered from works last September; £28, bargain.—Walker, Draper, Stamford. [1626]
- 1915 1/2 Combination Lightweight Calthorpe-Jap**, 2 1/2 h.p., perfect, new condition, 2-speed; cost £50, sell £37; without sidecar £30.—Phillips, Tobaccoist, Ware. [1649]
- CALTHORPE-J.A.P.**, 2 1/2 h.p., Enfield, 2-speed, quite new, but slightly shop-soiled; special bargain, £31/15.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [1663]
- CALTHORPE Motor Cycles**, 1916 Models.—Just arrived: 2-stroke 2-speed 31 gus., J.A.P. 2 1/2 h.p., 2-speed 36 gus., easy terms arranged.—Storeys, 118, 61, Portland St., W. [0777]
- CALTHORPE-J.A.P.**, 1916, 2 1/2 h.p., 2-speed Enfield gear, free engine, latest model, with sloping frame, variable ignition, semi-automatic lubricator; 36 gus.; delivery from stock; cash or extended terms.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0608]
- CALTHORPE**—1916 new lightweights from stock, improved design, fitted with J.A.P. engine and Enfield 2-speed gear, £37/16; identically the same machine without 2-speed gear, £32; 2 1/2 h.p. 2-stroke 2-speed model, £32/11; extended payments arranged.—Wauchope's, 9, Shoe Lane, Fleet St., London. [X3611]
- CALTHORPE-J.A.P.'s**, with Enfield gear, £37/16; also two bargains—1915 2-stroke 2-speed, 1916 engine, £30/10; and 1915 2 1/2 h.p. 2-stroke, 1916 engine, £27/14; accessories no extra; liberal deferred payments if desired.—Lumb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1679]

## Centaur.

- 31 h.p. 1912 Centaur**, Avon, Bosch, B. and B., Mabon 32 clutch, smart machine, splendid order; bargain, £18.—28, Auckland Rd., Clapham Junction. [1646]

## Chater-Jap.

- CHATER-J.A.P.**, 1913, 2 1/2 h.p., 3-speeds and clutch, reliable solo mount, bargain; £19, cash.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0481]

## Chater-Lea.

- CHATER-LEA**, 1913, 6 h.p., clutch, and art cane side entrance sidecar, perfect, with all accessories; £28, or solo, with speeds.—L. King, 80, Cornamie Rd., Brixton. [1831]



## MOTOR CYCLES FOR SALE.

## Chater-Lea.

CHATER-LEA. 8h.p., Bosch mag., Binks carburettor. Bates tyres, Paddy belt, short frame T.T. machine, fast and powerful, complete, with speedometer, and all accessories; bargain, £40.—Watson, Woodlawn, Spence Park, S.W. [1842]

## Chater-Lea-Sarolea.

CHATER-LEA-SAROLEA. 5-6h.p. twin, perfect condition, new Stelastie tyre on back, spare belt; owner enlisted; £20, or nearest offer.—Wilcox, 70, Colden St., Peterborough. [X5150]

## Clyno.

1914 2½h.p. 2-speed Clyno, splendid condition; 26 gns.—Motor, Temple St., Halifax. [X3654]

CLYNO 1915 2½h.p. 2-stroke, mag., like new; £24/10.—1, Ebner St., Wandsworth. [X3665]

CLYNO, 2-stroke, footboards and accessories; £21/10.—Colmore Depot, 31, Colmore Row, Birmingham. [X3497]

6h.p. Clyno, 2-speed countershaft, and Gloria sidecar, grand order; cheap for cash.—Thompson, 30, Orford St., Ipswich. [1717]

1915 Clyno, 2½h.p., 2-stroke, clutch, brand new condition, unspratched, perfect, full equipment; £29.—5, Forester St., Canal Rd., Mile End. [1809]

CLYNO 6h.p. Combination, Oct., 1914, 3 speeds, spare wheel, hood, screen, lamps, guaranteed; £65 no offers.—Ritchie, 623, Gt. Eastern Rd., Glasgow. [1672]

1914 Clyno Combination, 6h.p., 3-speed, kick starter, spare wheel, speedometer, lamp, horn, tools, very little used; bargain, £65.—Bowerman, Cullompton. [1650]

CLYNO Combination, 1914, 6h.p., 3-speed, interchangeable wheels, speedometer, spare wheel, wind screen, accessories, excellent condition; £63.—11, Barcombe Av., Streatham Hill, S.W. [1712]

CLYNO, 1914, overhauled, re-bushed, 3-speed, speedometer, lamp sets, spare wheel, coach sidecar, spare chains, nearly new tyres, parts, valves, everything for road; sell £55, or exchange Morgan or Henderson combination, not later 1914.—Particulars, Lester, Treherbert, Glam. [1696]

## Connaught.

SHREWSBURY Agent for Connaughts; early delivery.—J. C. Pickering. [X3447]

CONNAUGHTS in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £28/7.—P. J. Evans, John Bright St., Birmingham. [1736]

## Douglas.

DOUGLAS, 2½h.p., V, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½h.p., U, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2½h.p., X, ladies', kick start, in stock; £56/14.

DOUGLAS, 2½h.p., W, 3-speed, clutch, in stock; £56/14.

DOUGLAS, 2½h.p., War Office model, in stock; £54/12.

DOUGLAS Agents and Specialists. Latest models at rock-bottom prices. Lists on application. T.A.: Bicycles. Tel.: 388.—Robinson's Garage, Green St., Cambridge. [16864]

DOUGLAS, 1916; immediate or early delivery; any model.—W. P. Edwards, Taunton. [X9965]

1915 3-speed 2½h.p. Douglas, condition as new; £45.—19, Lewis Grove, Lewisham. [1755]

1911 2½h.p. 2-speed Douglas, nice condition; bargain, £23.—27, Raglan St., Halifax. [X3656]

2½h.p. Twin-cyl. Douglas, Bosch mag., in good condition; £9.—1, South Norwood Hill, S. Norwood. [1620]

DOUGLAS, 1913, 2-speed, T.T. model, very hot, tyres like new; rare bargain, £52.—Bunting, Harrow. [1726]

10 GNS. for 1910 Douglas, running order, but wants re-bushing.—Troward, Heathurst, The Vale, Hampshire. [1891]

DOUGLAS, 1914, and accessories, tyres and general condition equal to new; £39.—103, Myddleton Rd., Howes Park, N. [1654]

DOUGLAS, 1914, T.T., 2 speeds, speedometer, lamps, mirror, as new; £34.—11, Luna Rd., Thornton Heath, Croydon. [1766]

1911 Douglas, 2-speed, tyres good, X'fall, just completely overhauled, perfect condition; £18.—Bell, Cowick Lane, Exeter. [1614]

1914 2½h.p. Model W Douglas, Lucas lamp and horn, speedometer; £44; splendid condition.—Brook Motors, Burnham, Som. [9689]

1914 Douglas, 2½h.p., 2-speed, complete, excellent condition; accept 33 gns.—Newham, 223, Hammersmith Rd., W. [1799]

DOUGLAS, 2½h.p., clutch, 2-speed, kick starter, lamp, etc., 1912; £26.—Myson, 89, Cromwell Rd., South Kensington, London. [1642]

DOUGLAS, 1915, immediate delivery any 2½h.p. model, including War Office black Douglas.—McEfat, Yeovil, Tel.: 50. [9203]

DOUGLAS, 1914, 2½h.p., 2-speed, T.T. model, large P. and H. lamp, excellent condition; £39.—S. King, Chemist, Sutton, Surrey. [1868]

# MAUDES

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### LIST OF EX-STOCK BARGAINS.

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1916 MODELS.	
ALLDAYS-ALLON, single-speed ...	£34 0
ALLDAYS-ALLON, 2½ h.p., 2-speed	£42 0
ALLDAYS-ALLON, 2-sp., and clutch	£45 0
SUN-VILLIERS, 2½ h.p., single-speed	£30 10
SUN-VILLIERS, 2½ h.p., 2-speed ...	£37 0
JAMES, 2½ h.p., 2-speed ...	£38 11
NEW RYDER, 2½ h.p., 2-sp. J.A.P.	£33 12
ZENITH, 4-5 h.p., countershaft ...	£73 18
B.S.A., 4½ h.p., 3-speed, all-chain ...	£64 0
B.S.A., 4½ h.p., ditto, chain-cmn-belt	£62 0
CALTHORPE, 2½ h.p., 2-sp., 2-str.	£32 11
SUNBEAM, 3½ h.p., 3-speed ...	£73 10
INDIAN, 5 h.p., 3 speeds, Model B ...	£70 0
INDIAN, 7 h.p., 3 speeds, Model C ...	£78 0
ENFIELD, 6 h.p., 3-speed, T.T. ...	£52 10
ENFIELD, 6 h.p., Combination ...	£39 5
LEVIS, 2 h.p., Popular model ...	£32 0
B.S.A., 4½ h.p., and No. 2 Sidecar ...	£80 18
ENFIELD, 6 h.p., electrical model ...	£105 0
MORGAN, 6 h.p., de Luxe, all equip. ...	£117 18 3
ROYAL RUBY, 2½ h.p., lady's, 2-sp.	£38 0
ROYAL RUBY, 2½ h.p., 2-sp., 2-str.	£36 10
COVENTRY EAGLE, 2½ h.p., 2-sp.	£36 15
COVENTRY EAGLE, 2½ h.p., 2-sp.	£44 2
CALTHORPE-J.A.P., 2½ h.p., 2-sp.	£38 17
J.H., 2½ h.p., 2-stroke, 2-speed ...	£39 5 6
CALTHORPE, 2½ h.p., lady's, 2-speed	£37 16

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SUNBEAM, 8 h.p., 1914, 3 speeds ...	£85
REX, 1914 (late), 3 speeds, 6 h.p. ...	£52
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B.S.A., 4½ h.p., 1915, 3 speeds ...	£68
TRIUMPH, 1911, 3½ h.p., clutch, and Sc.	£22
TRIUMPH, 1912, 3½ h.p., 2-speed ...	£32

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DOUGLAS, 1915, 3 speeds, 2½ h.p. ...	£50
LEVIS, 1914, 2-speed, 2-stroke ...	£24
RUDGE, 1914, 3½ h.p., T.T., Multi ...	£42
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KERRY-ABINGTON, 3½ h.p., 2 speeds ...	£22
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REX, 1909, 3½ h.p., 3-sp., handle start	£21
P. & M., 1913, 3½ h.p., 2-sp., handle start	£35
VELOCETTE, 1915, 2½ h.p., 2-sp., 2-str.	£32
ZENITH, 1913, 3½ h.p., clutch ...	£38
DIAMOND, 1914, 2½ h.p., 2 speeds ...	£30
DOUGLAS, 2½ h.p., 1913, 2-speed ...	£34
O.K., 2½ h.p., 1915, 2-speed ...	£28
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1916 MORGAN de Luxe, hood, screen, side lamps, rear lamp, mechanical horn ...	Price £117 18 3
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OVERLAND, 1916, Model 86, electric light and starter, 5-seater ...	£200
CADILLAC, 1914, 20 h.p., 5-seater, electric equipment and self-starter, excellent order ...	£250
SUPER, 7-9 h.p., twin, w.c., 6 speeds, speed model ...	£75
MORGAN G.P., No. 1 Model, 1916 ...	£119
MORGAN G.P., mag. eng. mod., 1916	£118 19
WILLIAMSON Cy-cl-ca, hood & screen	£126
LUCAR Light Car Coupe, 10 h.p., 1915	£210

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1915 2½h.p. W.O. Douglas, not run 1,000, Dunlops, splendid condition throughout; £45.—At St. John's Motor Works, Thorofare, Woodbridge. [1744]

1914 2½h.p. Douglas, 2-speed and clutch model, kick starter, in excellent condition, tyres good, done 5,000 miles; £35.—Pyttchley Garage, Banbury. [1803]

DOUGLAS (December, 1915), 3-speed model, not ridden 100 miles; cost £54; sacrifice for immediate sale £37/10.—Truss, 8, Fox Hill, Upper Norwood. [1627]

DOUGLAS, 2½h.p., 1915, 2-speed, perfect condition, Lucas head and tail lamps, Brooks pan seat, horn, very little used; £43.—Harry's Stores, Morriston. [1648]

DOUGLAS, 1915, 2-speed, almost new, scarcely scratched, £42; also two 1914 models at £35 and £38.—Percy and Co, 337, Euston Rd., London. [1498]

DOUGLAS 1915 Combination, 2 speeds, and coach-built sidecar, almost new, disc wheels, smartest turnout in London.—Percy and Co, 337, Euston Rd. [1494]

DOUGLAS, bought Xmas, 1914, 2 speeds, and footboards, practically new; owner long unwell, and machine idle; £39, including lamps.—Bunting, Harrow. [1724]

DOUGLAS 1914 T.T., 2-speed, Binks, footboards, lamps, mechanical horn; £35; seen by appointment.—Richardson, 12, Maresfield Gardens, Hampstead. [1772]

DOUGLAS, Nov., 1914, model V, T.T., almost new; owner France since March last; £38; perfect, well kept; trial.—A. Neville, 17, High St., Kingston, S.W. [1810]

DOUGLAS, model U, 3-speed, £52/10; model V, 3-speed, £52/10; model W, 3-speed, £56/14; delivery from stock.—Exeter Motor Cycle Co., Ltd., Exeter, and Plymouth. [0790]

1915 4h.p. 3-speed Douglas Combination, plated screen, two 35/- Millers lamps, mechanical horn, equal to new; 68 gns., bargain.—Prince, 158, Green St., London, N.E. [1701]

DOUGLAS Models U and V, immediate delivery, £50/8; 1914 2½h.p., clutch model, good tyres and belt, £35; first cheques secure.—Colmore Depot, 62, High St., Leicester. [1615]

DOUGLAS, 3½h.p., clutch, 2-speed, kick starter, speedometer, lamp, accessories, new Mar, 1915, only travelled 2,800 miles; £46.—Myson, 89, Cromwell Rd., South Kensington. [1641]

1915 Douglas, model W, 3-speed, complete with lamps, horn, speedometer, etc., all in splendid condition, only done 3,000; £45.—Boyce, 275, Archway Rd., Highgate, N. [1700]

DOUGLAS, 2½h.p., 1914, 2-speed, free engine, kick starter, only used 2 months, all accessories, carefully garaged since mobilisation.—Capt. Stubbs, R.A.M.C., 1st Black Watch, B.E.F. [1622]

DOUGLASES in stock, model V 3-speed £52/10, War Office £54/12; special deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1673]

DOUGLAS.—Immediate delivery models U, V, W. Book your orders now from the sole agent for Anglesey and Carnarvonshire. Tel.: No. 5.—Jones, Anglesey Motor Mart, Llanfairpwll. [X9486]

1913 Douglas, model R, 2-speed, free engine, clutch, overhauled, complete with lamps, mechanical horn, Cowey speedometer, heavy tyres, new kit of tools; bargain, £30/10.—G.H., 317, City Rd., E.C. [1671]

DOUGLAS, 2½h.p. war model, 1915, purchased last September, only run 500 miles, property of wounded officer; cost with lamp and horn £57, will take £48 for cash.—Williams, Deacon's Bank, Blackpool. [1647]

## Enfield.

ENFIELD 1916 6h.p. Combination, 85 gns.; delivery from stock; exchanges.—Below.

ENFIELD, 1916, 3h.p., 2-speed, twin; 50 gns.; delivery from stock; exchanges.—D. J. Shepherd and Co., Enfield Highway, N. [1668]

JULIAN'S, Broad St., Reading. Phone: 1024.—Immediate delivery of all Enfield models. [X2855]

ENFIELD 1916 6h.p. Combination and 2-stroke Model for immediate delivery.—Moss, Wem. [X3639]

ENFIELD Combination, 1913, exceptional condition; £55.—Keen, 5, Clyde Rd., Alexandra Park, N. [1715]

2½h.p. Enfield, 1911, new tyre, good order; 13 gns. to clear.—Troward, Heathurst, The Vale, Hampshire. [1892]

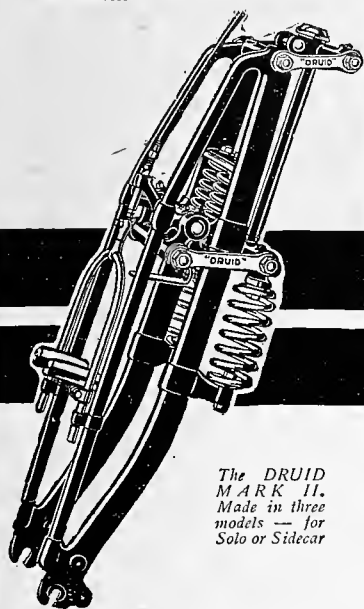
1913 2½h.p. Enfield Twin, good condition, good lamp, horn; £24.—F. Wilsbaw, Quarry, Audley, Staffs. [X3535]

1915 3h.p. Royal Enfield, speedometer, all accessories, not run 1,000; £43.—Alderside, Manne Av., Moakseaton. [X5579]

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ENFIELD 1915 6h.p. Combination: a bargain, £67. —Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [1665]

ENFIELDS, 6h.p., 3h.p., electric Model de Luxe, in stock.—Newton's, Manchester sole agents, 5, Blackfriars St. [X2713]

ENFIELDS.—I have 1914 and 1915 combinations at right prices; write for particulars.—Pitts' Stores, Redditch. [X3701]

ENFIELD. 3h.p., 1915, 2 speeds. Palmer cord tyres, as new; £35; must sell this week.—Write, Enfield, 31, Beechwood Av., Thornton Heath. [0783]

ENFIELD Combination, complete, done 5,000 miles only: expert examination and trial; £68/10.—Colwell, Lorna, Leekhampton Rd., Cheltenham. [X3525]

1914 6h.p. Enfield Coach Combination, fully equipped, and almost new condition, beautiful turnout; £59/10, bargain.—197, London Rd., Kingston. [1689]

ENFIELD, 1916, 2½h.p., 2-stroke, 2-speed, and free engine, complete, Lucas spares, new condition; £38.—P. J. Evans, John Bright St., Birmingham. [1751]

1912 6h.p. Enfield, special wide coachbuilt sidecar to seat 2, accessories, etc.; £45, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0722]

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ENFIELDS actually in stock for immediate delivery, combinations, 3h.p., and 2½h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [1755]

ENFIELD, as new, 1915, 3h.p., 2-speed model, latest type Palmer tyres, Lucas lamp set and horn; cost £58, with extras; accept £39 cash.—Apply, Nye, 12, Hood St., Newcastle-on-Tyne. [1630]

ENFIELDS in stock, standard 85 gns., De Luxe electric model with hood and screen £110; also 8h.p. standard 87 gns.; generous deferred terms.—Lamb's, Enfield Specialists, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1675]

ENFIELD, 1916 models in stock, ready for immediate delivery; 6h.p. combination £89/5, 3h.p. twin 2-speed T.T. model £52/10; exchanges or extended terms.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

ENFIELD 6h.p. Combination, absolutely perfect condition, extra powerful dynamo lighting set, 5 lamps, electric and bulb horns, speedometer, hood, screen, spare tyre and petrol carrier; cost £116; best outfit on road; accept £75; war reason selling.—Farrar, 2, Thornburn Sq., London, S.E. [1707]

1916 Enfield Combination, 6h.p., fitted with Lucas electric lighting set, Lucas electric horn, Watford trip speedometer, hood and screen, X'fall 50/- saddle, electric inspection lamp, bulb case and spare bulbs, mirror, all spares, done 246 miles: illness causing sale; cost £120, accept best offer over £96.—44, Garage Rd., King's Heath, Birmingham. [X3608]

ROYAL Enfield New Combination, 6h.p. and 8h.p., chain-driven machines, fitted with handsome coachbuilt sidecar, countershaft gear and free engine, up-to-date turnout, complete with storm avron; 85 gns.; tuition free, and free delivery to any address within 50 miles of London; best terms for cash, exchange, or extended payments.—Wauchope's, 9, Shoe Lane, London. [X3609]

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BRITISH Excelsior. 2-stroke, 2½h.p. T.T., brand new, with lamps, horn, pump, tools, etc., from makers 12 weeks ago; guaranteed cost £32/10; accept £26, lowest.—Emerald Cottage, High St., Marple-by-the-Sea. [X3495]

7-9h.p. Excelsior (American), late 1915, Bosch, 3-speed gear box, Lucas lamp, mileage 400, Mills-Pulford sidecar (£15), colour turnout grey; nearest £65; separate if desired; approval.—10, Norwood Crescent, Southport. [X3629]

#### Fafnir

8-10h.p. Fafnir Twin, w.e., and clutch, good order, for second-hand motor cycle.—R. J. Hayes, Rogerstone, Mon. [X3661]

#### F.N.

F.N., 2½h.p., 1911-12, 2 speeds, F.E. shaft drive, Bosch, seven running; £14/10, offers.—Speculley, 45, Church Rd., Acton. [X3633]

F.N., 2½h.p., magneto, 3-speed just been fitted (cost £10/10), in real good order; accept £14.—Percy and Co., 337, Euston Rd., London. [1499]

F.N., 1914, 4 cyls., 2-speed, shaft drive, torpedo cane sidecar, new tyres; £55; exchange small car, cash adjustment.—Box L787, c/o The Motor Cycle. [1584]

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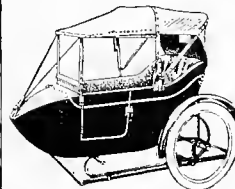
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1916 FORD Chassis, 20 h.p. ....	£115 0
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1916 6 h.p. ENFIELD Combination .....	85 gns.
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2-speed RADCO, 2-stroke, fine condition ..	£25 0
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GRANDEX-PRECISION, 1916, 2-stroke, 25 h.p., quite new; listed £54, for £31; fine model.—Grandex, 86, Gray's Inn Rd., W.C. [1705]

## Harley-Davidson.

1916 Harley-Davidson; all models in stock.—Parker and Son, St. Ives, Hunts. [1844]

SHROPSHIRE Agent for Harley-Davidsons: 1916 models, delivery from stock.—J. C. Pickering. [X3448]

HARLEY-DAVIDSON Models in stock, complete with Gloria sidecar.—Turpius, 22 and 29, Preston Rd., Brighton. [0713]

1916 Harley-Davidson and Swan sidecar, model 11J, only been run on the road 3 weeks; owner goes to the front: £130.—Brook, Motors, Barham, Som. [3891]

1915 Harley-Davidson, Coronet sidecar, new last November, tyres non-updated, fully equipped, any trial; price £72.—Lt. Martin, Buller Barracks, Aldershot. [X3441]

HARLEY-DAVIDSON, 11F, P. and H. lamps, £20 Canoelet sidecar, not done 1,000 miles; £85, no offers; exchange 1915 M.A.G. Morgan de Luxe.—Halsed, Jun., Ryde. [1666]

HARLEY-DAVIDSON, 1915, only run 600 miles, Gloria No. 5 sidecar, hood, screen, spring wheel, and every refinement, like new. £87.—Geo. Norton and Co., 358, Stratford Rd., Sparkhill, Birmingham. [X3646]

HARLEY-DAVIDSON, latest 1915, 11F, 3 speeds, with special Montgomery sidecar and screen, all accessories, very little used, as new, and guaranteed; £82.—Andrade, 1, Colosseum Terrace, Regent's Park. [1816]

## Henderson.

HENDERSON 4-cyl. Luxurious Combination, practically new; £80; bought car.—233, Clapham Rd., S.W. [1757]

HENDERSON, 1916, model E, 4-cyl., nearly new, 2-speed gear, clutch, lamp, horn, etc.; cost over £90; perfect condition; sacrifice £72/10; good reason for selling.—Kelly, 1, The Close, Walton Park, Liverpool. [1334]

## Hobart.

HOBART, 1915, brand new, 2 1/2 h.p., 2-stroke, 2 speed; list price £36/15, reduced to £30 for cash only; full guarantee.—Elce and Co., 15-16, Bishopsgate Av., Canonville St., E.C. [0551]

## Humber.

HUMBER, 3 1/2 h.p., 1912, 2-speed, and Mills-Fulford sidecar, in splendid condition; £32. Phone: 96 Richmond.—38, The Green, Twickenham. [1875]

2 1/2 h.p. Twin Humber, 3-speed, free engine, Stewart gear, speedometer, lamps, horn, appearance as new; bargain, £24.—Boden, Vainona, Alford, Lincs. [1634]

HUMBER Twin, 2 1/2 h.p., 1913, just been re-bushed, re-enamelled, etc., guaranteed first-class condition; £20.—Firth, 27, Woodbridge Rd., Moseley, Birmingham. [X3103]

## Indian.

1916 Indias; all models in stock.—Parker and Son, St. Ives, Hunts. [1845]

INDIAN, 1916, new, 5 h.p., model B, actually in stock.—Moss, Wem. [X3640]

14/10—Indian, fine running order; seen any time.—Speechley, 45, Church Rd., Acton. [X3634]

5 h.p. 3-speed Indian, and Bramble sidecar to match; £70.—Parker and Son, St. Ives, Hunts. [1846]

JULIAN'S, Broad St., Reading. Phone: 1024.—Immediate delivery of all Indian models. [X2836]

SHREWSBURY Agent for Indians; all models from stock, or early delivery.—J. C. Pickering. [X3449]

INDIANS, 1916; immediate delivery, all models, these fine machines.—W. A. Edwards, Taunton. [X9966]

INDIAN and Sidecar, coachbuilt, 7 1/2 h.p.; bargain, £35.—241, Lower Clapton Rd., Clapton, N.E. [1609]

1915 Indian, 7 1/2 h.p., clutch model, very fast, in splendid condition; £50.—Brook, Motors, Barham, Som. [19890]

INDIAN, 1915, 7 1/2 h.p., clutch model, only done few miles; price 45 gns., a bargain.—W. G. Wyatt, Yattendon, Berks. [X3527]

INDIAN Combination, red, 1911-12, 7 h.p., 2-speed, clutch, splendid order; £29/10.—Letters, 64, Melrose Av., Mitcham. [1851]

INDIAN, T.T., 1914, very fast, Kempshall tyres, mechanical horn and tools; £43.—Apply, Palace Pier Garage, Brighton. [1865]

INDIAN 1915 Combination, 3 speeds, kick starter, almost new, run 1,400 miles, speedometer; £60.—Percy and Co., 337, Enston Rd., London. [1496]

INDIAN Combination, 1914 1/2, cost over £100, electric equipment, mileage under 3,000, splendid condition; £53.—7, Grafton Sq., Clapham. [1758]

7 1/2 h.p. Indian, T.T., clutch, good tyres, fine machine, exceptionally fast; £30, or exchange lower power.—C. Pritchett, 141, Merton Rd., Wimbledon. [1776]

1915 7 1/2 h.p. 3-speed Indian and sidecar, property of an officer on active service; sacrifice for quick sale £55.—C/O Wilkin, Hunter's Bar, Sheffield. [1824]

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An ENFIELD Comb'n 6 h.p. for . . . . .	£19 7 0
And 12 Payments of . . . . .	£6 2 6
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P. & M. Combination, 1914, with luggage grid, lamps, horn, plenty of spares . . . . .	£55 0
CLYNO Combination, 1914, 3 speeds, with No. 6 Sidecar, hood and screen, lamps . . . . .	£67 10
TRIUMPH, 1913, 3-sp. gear, lamp and horn, with side-entrance Sidecar . . . . .	£40 0
O.K.-PRECISION, 2 1/2 h.p., magneto, spring forks, etc., 1913 machine, nice order . . . . .	£16 0
RUDGE, 3 1/2 h.p., 1911, with 2-speed gear and free engine . . . . .	£22 10
TRIUMPH, 1912, clutch model, nice order . . . . .	£28 0
LEVIS Popular, 1915, with lamps, horn, knee grips, etc. . . . .	£24 0
JAMES Combination, 1914-15, 4 1/2 h.p., 3 speeds, and accessories . . . . .	£52 10

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SOLE LONDON AGENTS FOR BROUGH, CONNAUGHT, CLYNO, & METRO MOTOR CYCLES, EMPIRE, MILLFORD, HERCULES, WATSONIAN & CANOELET Sidecars IN STOCK.

## MOTOR CYCLES FOR SALE.

## Indian.

INDIAN, 1915, 3 1/2 h.p. twin, T.T. bars, 3-speed, clutch, and kick-starter, condition as new, lamp set, rear light, and horn complete, guaranteed; £45.—Below.

INDIAN, 1915, 5 h.p., 3 speeds and clutch, T.T. bars, Model de Luxe sidecar, splendid order; £58.—Elce and Co., 15-16, Bishopsgate Av., Canonville St., E.C. [0480]

1914 Indian Combination, 7 1/2 h.p., electric equipment, 1915 kick starter, splendid condition; £55; exchange T.T. Douglas and cash.—150, Markhouse Rd., Walthamstow. [1729]

INDIAN, 7 1/2 h.p., 1915, road racer, clutch model, broad new, and guaranteed perfect; new price £65, absolute gift, £56/10.—Forde and Browne, Berry St., Liverpool. [1335]

INDIAN, 1915 1/2, 7 1/2 h.p. model C, 3-speed, electric lamps, horn, semi T.T. bars, spares, done 1,500 miles, perfect condition; £60.—Lieut. Bryant, 23, Sinclair Rd., Keosington, W. [X3562]

1914 7 1/2 h.p. 2-speed Electric Starter Indian Combination, electric lamps, horn, speedometer, etc., done 4,000, splendid condition; £56, or lower power part.—Box 158, c/o The Motor Cycle. [X3676]

1914 (late) Indian and Millford combination, 7 1/2 h.p., 2-speed gear, free engine, speedometer, lamps, horn, new tyres and spares, grand condition; bargain, £60, or nearest.—Bowerman, Cullompton. [1638]

INDIAN 7 1/2 h.p. Coachbuilt Combination, late 1915, electric lighting, 3-speed, new, little used; officer leaving for France.—£70.—Mandley and Sparrow, 145, Victoria St., St. Albans. Phone: 229. [1762]

INDIAN, 1915 7 1/2 h.p., road racer, with torpedo underslung, can sidecar, electric head and tail lamps, Lucas horn, practically new outfit; £47/10.—Elce and Co., 15/16, Bishopsgate Av., Canonville St., E.C. [0598]

INDIAN C, 7 1/2 h.p., 1915, 3-speed combination, brand new cycle tyres, 19 gns. Millford sidecar, perfect condition; £70; advertisement valued; seen any time by appointment.—78, Lee Rd., Blackheath, S.E. [X3650]

1915 Indian (October), 7 1/2 h.p., model D, not done 300 miles, very fast, brand new condition, all accessories, £52, bargain; owner going abroad.—Colonel Barton, Royal Engineers, Clacton-on-Sea. [X3470]

INDIAN, 1913, 7 1/2 h.p., 2-speed, clutch and kick starter, complete with Godfrey's coachbuilt sidecar, just re-enamelled, Bowler control, accessories, £55, or reasonable offer.—Hovenden, Glebeholme, Barnes, S.W. [1814]

INDIANS in stock for immediate delivery, models B, C, F, and G; book for early delivery of the Indian 2-stroke.—P. J. Evans, sole Birmingham and Midland distributing agent, 87-91, John Bright St., Birmingham. [1734]

INDIAN Model B, 5 h.p., £70; model F, Power Plus, £90; model G, 7 1/2 h.p., Power Plus, £75; also sidecars to suit; generous extended payments, liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [1680]

INDIAN, 1913 1/2, looks like new, 7 1/2 h.p., with speedometer, lamp, tools, spares, etc., also including lovely coachbuilt sidecar, with hood and screen; will accept £56, or near offer.—Apply, Chas. H. Mayo, Ivydene, Queen's Rd., Hersham, Walton-on-Thames. [1345]

INDIANS, second-hand, overhauled, and guaranteed by P. J. Evans, John Bright St., Birmingham. 1915 7 1/2 h.p. 3-speed combination, £70; also 7 1/2 h.p. 2-speed sporting combination, with electric set, £48; 1911 5 1/2 h.p. clutch model, with coachbuilt sidecar, thoroughly sound; £32; all the foregoing are perfectly sound. [1730]

## Ivy.

1913 3 1/2 h.p. Ivy-Precision, fixed engine, adjustable pulley, thoroughly overhauled and enamelled, splendid condition; £28.—15, Elmsthorpe Av., Lenton, Nottingham. [X3678]

IVY-J.A.P. 6 h.p. Combination, July, 1915, Model de Luxe, 3-speed countershaft, hand clutch, Brampton Biflex spring forks, coachbuilt Ivy sidecar, hood, screen, speedometer, Klaxon horn, lamps and spares, tyres heavy studded Dunlops, excellent condition; owner returning to India; accept £75.—Eldridge, Fordingbridge. [1661]

## James.

SHREWSBURY Agent for James; early delivery all 1916 models.—J. C. Pickering. [X3450]

JAMES, 2-stroke, 2-speed, in new condition, complete with lamps, etc.; £33/10.—Sanders, Garage, Kidderminster. [X3652]

JAMES, 1914, 4 1/2 h.p., 3 speeds, clutch, and starter, excellent condition; £42.—P. J. Evans, John Bright St., Birmingham. [1733]

LATE 1914 4 1/2 h.p. James with coachbuilt sidecar, run 100 miles, equals new, all accessories; £50.—R. E. Jones (Garages), Ltd., Swansea. [0784]

JAMES, late 1915, 2-stroke, 2-speed, lamp, horn, tools, complete, splendid order, very little used, £33, offers.—Findlay, 7, Glebe Rd., Llanelli. [X2871]

1915 4 1/2 h.p. James Combination, 3-speed, extra silencer, mechanical horn, new, Kempshall; owner enlisted.—Redearn, 111, High Rd., Chiswick. [1765]

JAMES 4 1/2 h.p. Combination, late 1915, countershaft 3-speed gear and clutch, splendid outfit, only been run a few miles, complete equipment; only 62 gns.; exchange for lower power and cash.—Newham, 223, Hammersmith Rd., W. [1800]

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

**Advertising and Publishing Offices:**  
20, Tudor Street, London, E.C.

Telegrams: "Cyclist, Fleet, London."  
Telephone: 2849 City (five lines).

**Editorial Offices:**  
Hertford Street, Coventry.

Telegrams: "Motorcycle, Covent y."  
Telephone: 10 Coventry (five lines).

**Northern Offices:**  
199, Deansgate, Manchester.

Telegrams: "Ilfie, Manchester."  
Telephone: 620 City.

## The Outlook.

**T**HE unexpected is always happening. The truth of this adage has been proved many times over during the past eighteen months by prophets who have attempted to foretell the future. The nation is undergoing a strenuous time, and compulsory service has been partially adopted. Owing to her isolated position, Great Britain has been able to do without this and other institutions which have held sway on the Continent for generations. It is useless to hide the fact that the adoption of compulsory service has had its effect upon the industry of late, but still the demand for motor cycles is brisk—thanks to the large following of wearers of khaki and Navy blue who form a goodly percentage of present-day motor cyclists. It is thought in more than one quarter that the Compulsory Service Bill will create a slump in second-hand prices on account of the number of machines which may now be offered for sale. No doubt there is a good deal in this contention, but we are of the opinion that prices will not be seriously affected, as the advent of spring, which is now at hand, will have a counterbalancing effect. At any rate, prices have not yet shown much downward tendency, and we know of a firm which, realising the shortage of new machines last year, is buying up all the modern motor cycles upon which it can lay its hands. After all, it is frequently overlooked that there are thousands of devotees of the motor cycle among men over military age. (The number of family sidecars to be seen on our roads is partial proof of this.) This section, together with the military aforementioned and an ever-increasing number of lady motor cyclists, added to which we have hundreds of youths whose parents, maybe, have purchased machines for them as an education in mechanics, and sometimes with a view to interesting them in engineering, provide the existing demand for new and second-hand machines.

Again, the motor cycle is no longer simply a luxury, and both it and the motor car have in most cases become a necessity and a part of our daily life. That we cannot do without them is more than ever the case, owing to the universal reduction in train services throughout the country.

It is undoubtedly a fact that officers and men quartered in out-of-the-way parts of the United Kingdom find that without a motor vehicle of some sort they are absolutely stranded, and the motor cycle, on account of its low first cost and the small outlay needed in its upkeep, is obviously the means of travel for all who cannot afford a car. Men join the Forces and go to the Front, and those who come back (not all, alas!) quickly return to their old love.

If the whole motor cycle industry, save for a few firms supplying Government machines, must lie dormant during the war, progress will be seriously hampered, and when peace once more reigns in this land of ours the British motor cycle, which has hitherto led the world, will receive a serious set-back.

## Push and Go!

**I**T has been stated in the House of Commons that the Government, acting through the Board of Trade, propose to take steps to allow the naval and military authorities first claim on all available supplies of petrol, public and commercial traction services second consideration, private consumers to be considered last. If this "drastic" announcement means anything it insinuates that hitherto military supplies of petrol had been interfered with by the supplies necessary for private consumption, but this is not the case, and we deplore the inference. But if it were justified, upon whose shoulders does the fault rest? Is it not extraordinary that we have seen nineteen months of war before the Board of Trade has discovered this fact? Beyond stating that there is not a single motorist to-day who would use a pint of petrol if he knew that he was depriving the Government of it, we will only observe that the announcement strikes us as another of those irresponsible utterings designed to stir up the prejudice of the non-motoring public against motorists. The announcement was made in the House by Mr. Lloyd George, whose activities we all admire, but the latest utterance can hardly be associated with the "Push and Go" for which he has become famous.

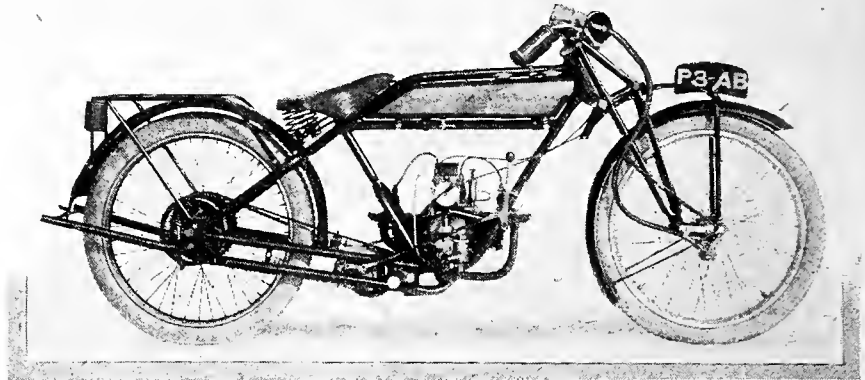


## A New 2½ h.p. A.B.C. Lightweight.

An Interesting Experimental Machine having a Horizontally Opposed 60×40 mm., 226 c.c., Engine

**F**EW engineers have shown more inventive genius in the construction of motor bicycle engines than Mr. Granville E. Bradshaw, the works manager of A.B.C. Motors, Ltd., Hersham, Walton-on-Thames. The little machine which we illustrate and describe herewith is, curiously enough, the outcome of the war. It is not intended to place it upon the market at the present time, but it has been built purely as an experiment. The tiny 226 c.c. engine was designed originally for the purpose of driving dynamo sets for the Government, being especially suitable for this purpose on account of its even torque and excellent balance. To test the engine to destruction, and also with a view to seeing how it would behave under road conditions, it has been placed in a motor bicycle frame, and a very charming little machine has been the result.

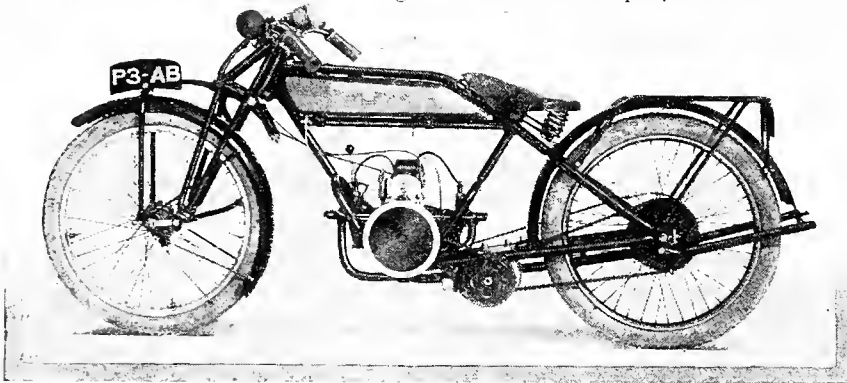
It will be noticed from the illustration that the frame is of somewhat strange



Off side of the new 2½ h.p. horizontal twin-cylinder A.B.C.

been fitted, in which the exhaust is underneath. The gear ratios are 6½ and 11 to 1, and on top the machine is said to do 48 m.p.h., and the maximum

with which he expects to obtain much finer results. At present, he tells us, the engine develops 4½ h.p. at 4,500 r.p.m. The saddle has an extremely low position, and is only 27in. from the ground. No valve lifter has been fitted up to the present, as this machine is not designed to take one, being originally intended for stationary purposes, but the machine is quite easy to paddle off from a standstill.



A machine of striking appearance—the 2½ h.p. twin-cylinder A.B.C. lightweight.

design, and the reason for this is that it was never intended to take this tiny engine, being originally constructed for a spherically headed engine, which was to have been built for racing purposes, but the production of which was stopped owing to the war; consequently the frame and forks are heavier than necessary. Moreover, the tyres are 2½in. in diameter, and therefore the total weight of the machine is over 100 lb., whereas, if it were built in a suitable frame, the weight, we are told, would not be much more than 75 lb., or 85 lb. with rear springing.

The interesting little engine, the design of which follows A.B.C. lines more or less entirely, weighs 14 lb. exclusive of magneto, carburetter, and flywheel, which add another 13 lb. The bearings are of the roller variety, and the bore and stroke are 60×44 mm. respectively. Lubrication is by means of a mechanical pump.

### Aluminium Pistons.

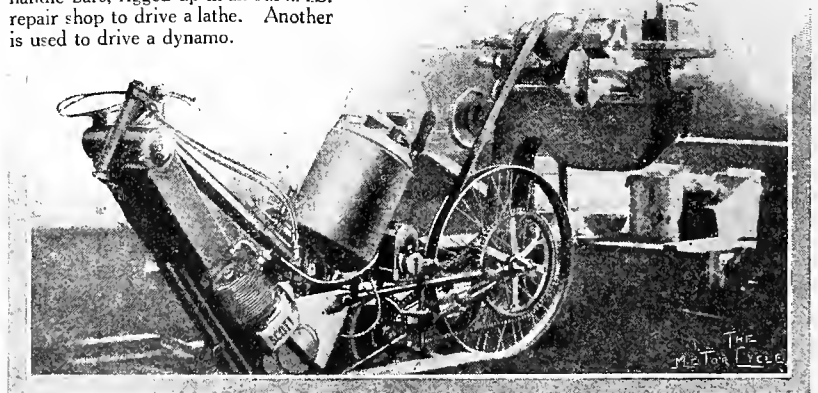
The pistons are of aluminium, and weigh 3 oz. each. So far as outside appearance goes, the only difference from the 500 c.c. A.B.C. engine is that a different type of cylinder head has

speed on the level on the low gear is claimed to be 37 m.p.h., at which speed the engine would attain nearly 5,500 r.p.m. An ordinary standard camshaft is fitted, but Mr. Bradshaw hopes to make a special high efficiency camshaft

We took the machine out for a short run, and found it delightfully smooth running, being even better balanced than the 500 c.c. Although the Claudel-Hobson carburetter had not been properly adjusted, the machine had a fine turn of speed, and took quite a steep hill on top gear with ease. At the present moment an Albion two-speed gear is fitted, and with a view to testing the smoothness of the engine the chain drive is solid—that is to say, no transmission shock absorber is incorporated. We were very much interested to be told of this fact, because we should never have thought it the case when actually riding the machine.

### THE ADAPTABLE MOTOR CYCLE.

A Scott, minus front wheel and handle-bars, rigged up in an R.N.A.S. repair shop to drive a lathe. Another is used to drive a dynamo.



# Occasional Comments by "Ixion"



## One Approving Voice.

I have only heard one man speak approvingly of the recent official circular about the abolition of pleasure motoring. He owns a 1906 accumulator ignition X—. He says he never uses it for pleasure, but that the labour which he usually expends on starting it would suffice to build three super-Dreadnoughts.

## Festina Lente.

The old motto "Make haste slowly" seems worthy of remembrance in an age when the single-cylinder two-stroke is still so far from perfect, and one nevertheless hears of bold experimentalists who are busied with multi-cylinder two-strokes. The job is by no means impossible—witness the manifold excellences of the Scott power unit. But I think our engineers should polish up the average single-cylinder baby a little before they launch out in more ambitious fields. With few exceptions it is far behind the average four-stroke in general development, though its intrinsic merits render it so eminently usable, even in its crude state of immaturity.

## The Petrol Famine.

In the district where I was staying last week-end, neither the Pratt nor the Shell agents had "even a leak" in stock; neither of them knew when further consignments might be expected. As a consequence, we mobilised a number of sidecars and light cars, and went the round of the garages within a certain radius, buying up old cans, mostly of the Taxibus grade. At this rate there will soon be a run on paraffin carburettors. What are the real facts of the situation? Is the Government secretly taking subterranean action, or is there a shortage of tank steamers and dock labour? The American Government has made it abundantly plain that the obstruction lies on British shoulders, as the stocks on the other side of the Atlantic beat all previous records.

## An Interesting Problem.

"F.C.J." has a 1912 7 h.p. Indian sidecar outfit, which has covered 20,000 miles without causing him any trouble. Recently a very distressing knock made its appearance; it was not the ordinary knock, such as results from carbonisation, worn bushes, or overloading; he describes it as creating the sensation of some unseen force hammering at the tank; the whole machine vibrated abominably, especially when changing gear or opening out. On looking round for the seat of the trouble, he expected to find the engine just hanging on by the last thread of the last bolt, or that a kind friend had put a 2 lb. hammer head inside the tank. Whilst investigating, he noticed that the tappet clearance at the overhead inlet valves was excessive, and adjusted till there was practically no clearance at all with the engine hot. On restarting the engine he found to his amazement that the knock had entirely disappeared, and that the usual liveliness and vigour

of the engine had returned in full measure. He desires our readers' explanations of this curious phenomenon.

## Light Car v. Motor Cycle.

I have just completed a long run in company with a very speedy light car and an 8 h.p. sidecar outfit, my own solo mount being a  $3\frac{1}{2}$  h.p. twin. I belong to that breed of rider who is a road-burner when surfaces and other conditions are safe, but, being afflicted with plenty of imagination, go very canny on grease, in traffic, and amidst cornersome places generally. Both my companion Jehus were of the absolutely nerveless order, and out for blood from start to finish. Nevertheless, I was always waiting for them to turn up at points where it was possible that we might take separate roads. All this shows how much faster the motor bicycle is in serious cross-country work than any other type of motor. I gained yards or furlongs on the light car up every hill, and round every corner where complete vision was impossible. The 8 h.p. sidecar was apparently a shade slower than the light car in corner work, perhaps because its brakes were less effective, as is usual in this particular comparison; but it gained enormously on the car up any and every sort of slope. It lost to me at corners and up straight hills.

## Tricycles.

I have received a few letters about tricycles, one of which illustrates the thoughtlessness of the prejudice against them. The writer remarks (quite truthfully) that the engine of his 1899 De Dion tricycle possessed but one rate of revolution on which throttle positions had no marked effect, and that the gear drive resembled a rock-crushing machine. Exactly; the one fault was due to the automatic inlet valve and the other to a crude and obsolete transmission. If these were the most serious objections to the ancient tricycles, a strong case exists for their revival, as these and many other drawbacks could not conceivably be reproduced in a modern development. *No modern engineer has seriously experimented with a modernised tricycle*; and it is at least possible that a solo three-wheeler, developed up to the limits of modern knowledge and modern practice, might prove a better all-weather machine than anything which we now possess. The interest taken some while ago in Mr. A. V. Roe's suggestion for a weatherproof non-skidding motor bicycle points to a demand. The main merits of that design were the complete protection of the driver and the provision of movable side struts, which enabled the machine to stand up when not in motion; its main defect was that it could skid at least as badly as the ordinary two-wheeler. A modernised tricycle would share all these merits, plus practically total immunity from skidding and complete accessibility of the vulnerable rear tyres. It could have a canoe body, in which the driver could recline, wearing no other storm-protection than a heavy coat; and even

**Occasional Comments.—**

this could be dispensed with if a low celluloid wind-screen were fitted. If two 3in. rear tyres were employed, mechanical springing would hardly be needed, punctures would not occur till after 5,000 miles usage, the tyres would run 8,000 miles per set, and a puncture could be repaired by slipping in a new tube. A noiseless and highly efficient transmission could be arranged with ease, engine and occupant could be mounted near the centre of a long wheelbase, and the demand from all-weather riders might become enormous.

**"Top Feed" Carburetters.**

I think some carburetter maker had better come out into the open to defend the placing of the petrol pipe union on the top of the float chamber instead of below it—the universal location until very recently. I believe the reason of the change is a desire to minimise flooding due to the needle hopping about under road vibration, and I am sure the new pattern

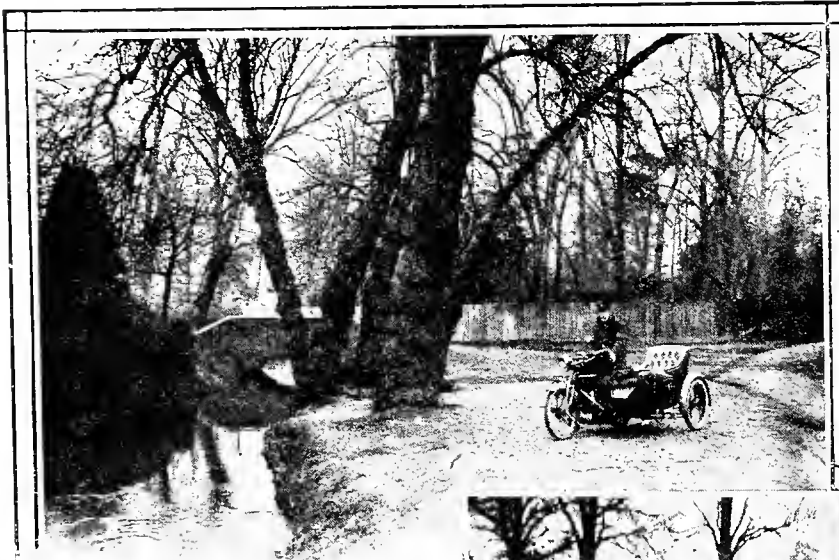
(3.) The shortened petrol pipe is more subject to air locks.

(4.) "Top feed" carburetters have no competition successes to their credit.

**The Other Side.**

Pending authoritative statements by one of the culprit manufacturers, I do not personally regard the above quartette of indictments as remarkably sound. The filter can easily be transferred to an upward bend in the pipe so that dirt is pushed against the lower side of the gauze by the flow of spirit, with a chance of dropping away from it; or, better still, a larger diameter filter can be used. I rather fancy that there is little difference between the two types of filter; surely the flow of spirit keeps dirt pressed against the underside of the gauze in the older type of filter? I do not see that the bayonet joint cap need be sacrificed, provided a hexagon is cast on it so that it can be steadied with one spanner whilst a second spanner

is applied to the union nut. Air locks do not occur on any properly designed petrol feed system; but may occur with either type of carburetter if the pipe passes near the exhaust pipe, if the whorls are in the vertical plane, or if the tank vent is inefficient. "Top feed" carburetters have not been long enough on the market to stand a chance in competitions. I think these four indictments are comparatively negligible, and that, on the other hand, the "top feed" system reduces vibration-flooding quite appreciably. Will some maker weigh in with his standpoint and other keen riders with their views?

**A WINTER RUN IN THE HOME COUNTIES.**

is successful in this respect. A week or two ago a reader complained bitterly that it rendered the float comparatively inaccessible, and—rightly or wrongly—I disagreed on the score that the tickler always informs you whether there is spirit in the chamber, and that one seldom needs to inspect or remove the float. One of our ablest amateurs takes quite a contrary view for the following reasons:

(1.) The filter is in the wrong place; the dirt lies on the gauze and chokes the supply of petrol.

(2.) The bayonet joint fitting of the float chamber lid is sacrificed.



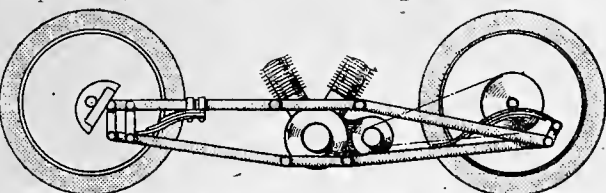
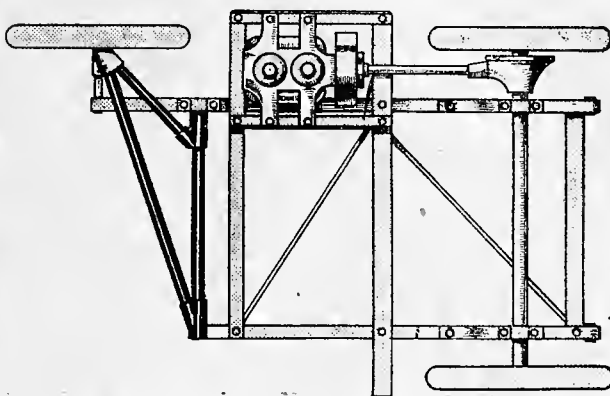
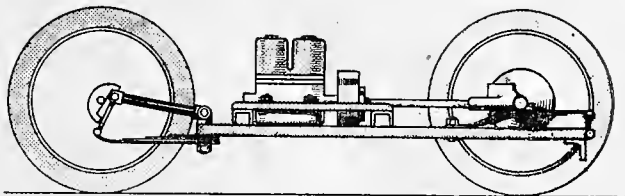
(Upper) A pretty view on the London-Broxbourne road.

(Lower) An ice-covered road near Ware, Herts. Photographs taken during a sidecar run with a convalescent soldier as passenger.

## The Scott Self-contained Sidecar.

IN *The Motor Cycle* of November 4th, 1915, there appeared an illustrated description of a three-wheeled sociable sidecar, the invention of Mr. A. A. Scott. The illustrations now published show alternative designs of the chassis, but even these are likely to be modified before the final vehicle is produced. The side view and plan reproduced herewith show one construction which is illustrated in that patent specification, and they make clear the principles involved. As will be seen, the frame consists of two parallel longitudinal members with transverse members at the ends. Intermediate of these are two other cross-members which are extended beyond the side members to form a bed for the engine. The latter is mounted upon short bearers between these two cross-members, and it will be noticed that the engine lies more or less in the plane of the two side wheels. There is a back axle which is shaft driven, and spring suspended from the frame very much on car lines, except that the propeller-shaft is at one side. The front wheel is on the same side as the engine, and is carried by a pivoted frame which is coupled by a strong leaf spring to the main frame. The general design is a blend of motor cycle and sidecar and motor car practice, the chief features being that both rear

wheels are driven, and there is no vertical frame carrying tanks, etc. And while the vehicle previously described was made up entirely of tubular members, one of the alternative forms illustrated herewith is constructed of pressed steel side and cross members. No. 1,294, 1915. A. A. Scott.



Alternative design propelled by a V-type twin-cylinder engine having a countershaft gear and belt drive to the rear wheel.

The new Scott three-wheeled sociable in elevation and plan. The engine is a 5 h.p. twin-cylinder vertical two-stroke.

## Lighting Tips.

### THE DISADVANTAGE OF TOO MUCH TUBING.

THIS winter I have experienced more than a moderate share of night riding, and abnormal winds and abnormal roads have taught their lessons ungrudgingly with regard to lamps. I started the winter with a good-sized generator, which supplied both head lamp and tail lamp, a length of brass tubing, running under the tank, connecting up the latter. I found that, unless the generator was in perfect trim, the pressure at the tail lamp was so slight as to produce a smoky flame, which was apt to go out on the slightest provocation. I then purchased a second generator, and ran the two interconnected, but was surprised to find that no greater pressure was obtained, while the eternal smell of gas warned me that a leakage was taking place through the needle valves.

All this trouble was simply and solely due to the loss of pressure caused by the great length of tubing used, it requiring the energy of the generators to pump the gas through the tubing, so that a weak flame appeared at the burners.

With ordinary generators the only way to obtain strong and steady flames at both lamps is (1) to have a separate generator to each lamp, and (2) to connect it thereto with as short a length of tubing as possible.

I have now mounted my tail lamp and generator on

the back of the sidecar body, so that they travel in a sprung position, and six inches of tube connects the two. The head lamp and generator are sprung with the handle-bars, and here, too, a six-inch length of tubing does it. There are no kinks and no corners, and the system is practically infallible. Lamp troubles vanished, indeed, immediately the long stretch of tubing to the tail lamp was discarded.

The length of brass tubing is still there, however, securely fastened at four points so that it cannot rattle, and by its use either of the generators can be made to light both lamps at a moment's notice should one give out, an extra length of tubing and a T connection being carried in the sidecar pocket for this purpose.

With regard to the metal tubing, great care should be taken, when bending it to fit, that no low point is left at which moisture can accumulate, as this will cause the tail lamp to go out repeatedly, and great difficulty may be experienced in locating the cause. Bind each point at which the rubber tubing is connected with insulation tape, as this will prevent perishing and splitting, and keep all the connections as short as possible. A spare length of tubing can be carried in the sidecar in case of roadside adjustments proving necessary.

H.M.B.



# THE AERO ENGINE.

## HOW WAR-TIME DEVELOPMENTS MAY HELP MOTOR CYCLE DES'GN.

(Previous instalments appeared in "The Motor Cycle" of December 16th and February 24th.)

**F**ROM the point of view of classification the next type to be discussed is the radial stationary cylinder engine; that is to say, an engine with cylinders disposed round the crank case in the same manner as the Gnome, but immobile, the crankshaft rotating in the orthodox manner. There is no question that the development of this particular type of engine owes much to the French constructor Anzani, and if there is a touch of the motor cycle in its design it is not to be wondered at, seeing the name that Anzani held in the motor cycle world.

Although the radial type of aero engine has much in its favour it does not seem to have made so much headway, in this country at any rate, as the V and vertical types. There is, however, an exception where big engines, such as the 300 h.p. Canton-Unne, for seaplanes are concerned. It is to the writer a moot point whether the comparative lack of popularity of the radial engine may be due to the disadvantages of the design, which are not great, to some conspicuous lack of success in some special case, to some unexplained prejudice, or to difficulty in obtaining an engine of the exact power and proportions required. There are undoubtedly many desirable features in the radial type. It is true that it lacks the advantages of the rotating cylinder type in the matter of smoothness and of drive. The torque of the radial engine may be as even, and the balance as good, but the flywheel effect of the mass of the revolving cylinders, pistons, etc., is missing. The radial engine has, however, certain advantages over the rotating cylinder. It can be made reasonably economical in consumption of lubricant and fuel—as economical, in fact, as an air-cooled engine of any type. There is no limit put upon its maximum speed of revolution by centrifugal force. If desired it can be produced as a water-cooled engine and made to show a reasonably high efficiency, and further it can be silenced, the last two being matters of difficulty, if not of practical impossibility, with the rotating cylinder type.

### The First Channel Flight.

From the point of view of the aeroplane builder there is against the radial air-cooled engine the same objection as to the rotating cylinder, that is to say, head resistance. In the case of engines of moderate power and size, i.e., 100 to 160 h.p., it is possible that suitable streamlining of the crank case or complete cowling of the cylinders might prove very beneficial, but the writer does not recollect any instance of this having been done.

There are many different radial engine designs, but the first to achieve any great popularity was the three-cylinder 25 h.p. Anzani. With the aid of one of these engines Blériot originally flew the Channel in 1909, that is, in the days when the Channel was to the

aviator a dangerous sea some 35,405,568 mm. across, each millimetre pregnant with unpleasant possibilities. Nowadays the Channel is more or less an incident in the day's work or a twenty minutes' long hop.

### The Three-cylinder Anzani.

This original type of Anzani had three cylinders 100 mm. bore x 150 mm. stroke; disposed like a fan around the top of the crank case, the two inclined cylinders making each an angle of 72° with the central vertical cylinder. The two worst features of this type from the point of view of design are that the firing impulses, and therefore the torque, are not delivered evenly. By reason of this fairly heavy flywheels are essential, and, owing to the disposition of the three pistons and the three connecting rods attached to a common crank pin, balance weights of considerable size become necessary. The design of the engine was simplicity itself, the cylinders were of cast iron with a number of fins, and the exhaust valve was at the rear of each cylinder with an automatic inlet valve carried in a cage above it. In the light of latter-day design the engine could hardly be regarded as very efficient. The valves were small, and for a cubical capacity of 3,534 c.c. a horse-power of only 25 was claimed at a speed of 1,300 to 1,400 r.p.m., whereas under modern racing car conditions an engine of the capacity would develop over 100 h.p.—perhaps an unfair comparison by virtue of cooling systems and speeds. After Blériot's initial success across the Channel many of these engines were fitted into various monoplanes, and any frequenter of Brooklands in those early days must recollect daring people just managing to wobble up into the air and keeping there with luck for ten minutes or so at about 100 feet or less before coming down, the duration of flying generally being limited to the time during which the maximum power could be got out of the engine without serious overheating. We do not mean to imply that the poorness of the performance was entirely due to the engine. It was simply that 25 h.p. was being used where something like 50 h.p. was really necessary.

The early Anzanis had two little habits. Most of them were provided with auxiliary exhaust ports consisting of holes drilled round the bottom of the cylinders and uncovered by the piston when the latter was at the extreme of its travel. These ports rather weakened the cylinder walls and a good many cylinders were blown off, whilst when starting up the engine if one carelessly flooded the carburettor quite a gratifying fire would arise if a flame from the auxiliary port set light to the flooding petrol.

This particular three-cylinder Anzani was afterwards superseded by another type which had considerable advantages over it. In this case the cylinders were placed at intervals radially around the crank case

**The Aero Engine.—**

in the form of a letter Y, the tail of the letter being uppermost and the space in the fork at the bottom being occupied by the carburetter. The cylinders were  $120^{\circ}$  apart, and the torque was very reasonably even, there being an explosion at every  $240^{\circ}$  of crankshaft revolution. The balance of this engine was fairly good. The inlet valve remained automatic, but the exhaust valve was then placed in the head and operated by means of a rocker and push rod. To get at these valves it is necessary to take the cylinders off, and, although this may strike one as a serious defect in any kind of petrol engine, the writer is rather coming round to the opinion that accessibility of the valves is of secondary importance nowadays, and will develop his views of the matter later in the article.

Whereas in the original Anzani the cylinders were attached by means of bolts passing through flanges at the feet, in the Y-type lugs are provided in the head through which a long bolt extends to the crank case on each side of the cylinder. In the fan type of engine the three connecting rods were all situated on the same crank pin, two of them being forked. The arrangement of the Y type, however, is quite different and rather interesting. Mounted on the crank pin is a bush. The end of each connecting rod consists merely of a simple saddle which beds snugly on the outside of the bush. Around the

edges of the saddles on each side are locking rings.

Some little space has been devoted to the Y type engine because it seems a design which might possibly commend itself to the motor cyclist. The torque is more regular than in the two-cylinder horizontally-opposed engine, and it is possible that such an engine might be made lighter for an equivalent power or more powerful

for the same weight, since so heavy a flywheel is not necessary.

**A Comparison.**

Figs. 1, 2, and 3 have been prepared to give some idea of the comparative sizes of two, three, and five-cylinder engines, all of 500 c.c. capacity. The drawings do not pretend to be designs, only simple diagrams conforming to reasonable proportions. Fig. 1 is a two-cylinder horizontal opposed engine,  $68 \times 68$  mm.; fig. 2 a three-cylinder,  $60 \times 60$  mm.; and fig. 3 a five-cylinder,  $50 \times 50$  mm. In each case a ratio of 1 to 1 for the bore/stroke has been taken as a fair value, and a connecting rod length of  $2\frac{1}{2}$  times stroke. In the engines with the greater number of cylinders it might be allowed to alter the bore/stroke value to 1.25 to 1

or more, and employ a lesser connecting rod length, so that the five-cylinder engine might be reduced still further in size. No allowance has been made for magneto, carburetter, and silencer positions. Doubtless these will occur to the reader. No insuperable obstacles appear, however. The proposition of the five-cylinder engine is put forward as a matter of interest; only experience could show the advantages or disadvantages in their true relationship. The five-cylinder radial might give in practice a smoothness of running and an even torque as good as, if not better than, a six-cylinder car, also the weight of five cylinders, as against two larger ones, might be more than counterbalanced by the saving in flywheel mass. The design could be arranged to place the cylinders in any convenient position; that is to say, it does not matter whether one cylinder points vertically downwards or vertically upwards. Under modern conditions of roller bearing big ends, pump lubrication, proper piston design, and reasonable care, there should be no trouble either with oiling or soot-ing up.

To return to the aero engine, the Y type Anzani was

**A COMPARISON IN SIZE BETWEEN 500 c.c. ENGINES OF TWO, THREE, AND FIVE CYLINDERS RESPECTIVELY.**

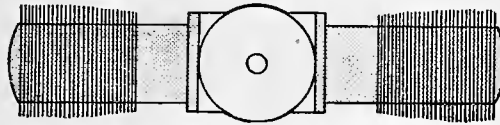


Fig. 1.—Two-cylinder  $68 \times 68$  mm. bore and stroke.

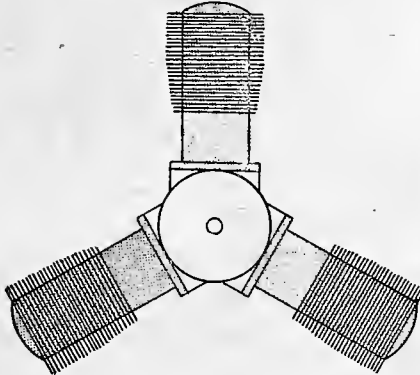


Fig. 2.—Three-cylinder  $60 \times 60$  mm. bore and stroke.

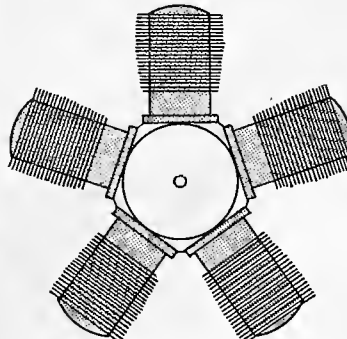


Fig. 3.—Five-cylinder  $50 \times 50$  mm. bore and stroke.

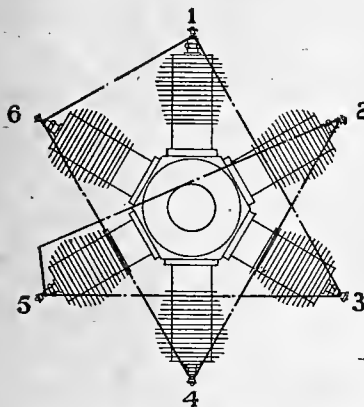


Fig. 4.—A diagram showing why radial engines generally have an odd number of cylinders to each crank pin. The above is a six-cylinder engine firing in the order of 1, 3, 5, 2, 4, 6, 1, with a wide gap between 5 and 2, and a short gap between 6 and 1.

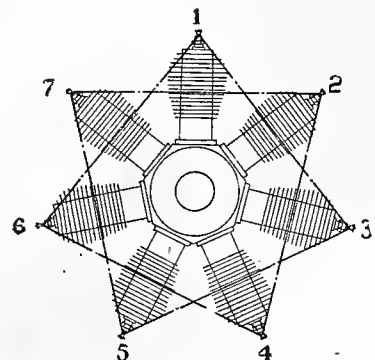


Fig. 5.—Another diagram having the same object as fig. 4. The above is a seven-cylinder engine, the firing order of which is 1, 3, 5, 7, 2, 4, 6, 1, giving an equal spacing between each firing impulse.

**The Aero Engine.—**

followed by a six-cylinder engine which really consists of two three-cylinder groups and a double-throw crankshaft. A further development was the production of a five-cylinder engine with the cylinders in the same plane and working on a single crank pin. This engine in turn was duplicated, making a ten-cylinder engine with a two-throw shaft.

It has probably occurred to those who are not already aware of it to wonder what is the reason that radial engines always have an odd number of cylinders rather than an even number. The simple diagrams (figs. 4 and 5) on the previous page serve to explain it. Unless the number of cylinders actuating one crank pin be odd, it is impossible to get a perfectly even torque. That is to say, the explosions will occur at slightly different spacings of a revolution of the crank-

shaft. This, of course, pre-supposes that a crankshaft of an even regular form is employed if there is more than one crank pin.

Fig. 4 shows the firing diagram of an imaginary six-cylinder engine, and fig. 5 is a diagram of a seven-cylinder engine. It is obvious that in fig. 4 the six cylinders cannot fire in direct sequence, otherwise they would all have fired in one revolution of the crank pin, and the second revolution would take place without a single impulse. The alternative is to make them fire alternately—that is, in order 1, 3, 5, 2, 4, 6, 1, and so on—but this means a wider gap between 5 and 2, and a short gap between 6 and 1. With the seven-cylinder engine, however, the firing order is 1, 3, 5, 7, 2, 4, 6, 1, etc., which, it will be seen, gives an equal spacing between each impulse.

M.T.

*(To be continued.)*

## The Handle-bar Controlled Clutch.

### Is it a Luxury or Necessity?

FOR some months past I have ridden a  $3\frac{1}{2}$  h.p. machine fitted with handle-bar clutch, and, though previous to this experience I considered such a clutch a very nice and useful thing to possess, I have now come to regard it in the stern light of an absolute necessity in the case of a single-cylinder machine with sidecar attached. Only when I get astride a machine fitted with a less accessible clutch control do I realise how much I use the clutch on my own mount, and of what immense value it is in saving the engine, tyres, and transmission throughout. I have become so used to using the hand clutch that the ordinary system of control now appeals to me as almost brutal, there being no efficient way of relieving

the load of the engine at the crucial moment without losing considerable headway.

One immense advantage of the handle-bar clutch is in the quickness with which the machine can be made to pick up after rounding a corner or passing traffic. One can keep the engine thumping at its best, the clutch just sufficiently eased to take off the dead resistance which would otherwise cause a konk, and thus full headway is again obtained in surprisingly short distance. In the same way one is able to pick up from middle to top on gradients which would necessitate a long grind on middle were one unable to manipulate the clutch with extreme delicacy. I am also the possessor of a 7 h.p. twin, but the  $3\frac{1}{2}$  h.p. simply leaves it standing on a tortuous route—the only explanation being that one can use the clutch of the latter to the best advantage.

Of course, all this slipping means wear of the clutch plates, but what of it? It will take a very long time for the plates to wear out, and I can then have them renewed for a very few shillings, which will be more than made up by the reduced wear on engine, tyres, etc.

I have no doubt whatever that the handle-bar clutch will increase in popularity, and the man who takes a pride in the tune of his engine will find that half the secret of maintaining concert pitch lies in his ability to relieve the engine of heavy loads at low speeds. Allowing an engine to "rev." does no harm whatever; it is the "konk-konk-konk" that spoils its tune quicker than anything.

H.M.B.



C. Hall, of Young, New South Wales, and the  $3\frac{1}{2}$  h.p. Singer, on which he has covered 20,000 miles. Mr. Hall is a Singer enthusiast, and tells us he has won many prizes with his mount, one of the machine's best performances on the road being the accomplishment of thirty-two miles in forty-five minutes.

A new oiling system, particulars of which we are at present asked not to divulge, has been invented by Mr. A. S. Baylis, one of the designers of the Junior Triumph. This new lubricating system will be equally suitable for use with any type of engine. The special point in connection with this system is that the amount of oil supplied to the various parts will be controlled by the throttle opening; thus when the throttle is open wide and the engine working hard the amount of oil is increased, while when running light the oil supply is diminished.

# "The Motor Cycle" Recruiting Section.

A further call for Motor Cyclists for the M.M.G.S.



Some of last week's recruits in the Motor Machine Gun Service. The central figure is Captain Kay, the Coventry recruiting officer, and on his right the Editor, Mr. Geoffrey Smith, who is inspecting officer for the M.M.G.S. and R.E.

ON going to press a telegram from the Officer Commanding the Motor Machine Gun Service to Mr. Geoffrey Smith, Editor of *The Motor Cycle*, calls for several hundred more recruits.

Motor cyclists prepared to join immediately need only send in the form of application on page 240, when they will be advised as to the next date of inspection, provided, of course, the particulars are in order.

To minimise the work entailed in dealing with the large number of applications received (amounting to nearly 400 in a week), recruits are urged to note particularly the following instructions:

Fill in answers to each question carefully, and particularly the date upon which you could join the Colours.

Do not apply until you are practically ready to join. (Many send in forms mentioning at the same time that they have applied to their local tribunals for exemption, whilst others ask to be accepted and join up with their groups in two or three months' time. Such applications cannot be dealt with.)

A number of riders who have been on the different waiting lists of inspecting officers of the Royal Engineers (Signal Section) for some months were enrolled in the M.M.G.S. last week. Preference will be given to other riders passed for the R.E. if such will apply, attaching the R.E. slips of acceptance to the M.M.G.S. form of application on page 240.

Queries as to vacancies in the R.N.A.S., R.F.C., A.S.C., and other sections continue to reach us. Readers may save needless correspondence if they will note that the M.M.G.S. is the only motor cyclist section open for immediate recruits.

Briefly, the terms of enlistment in the M.M.G.S. are as under:

Age limits 19 to 40.

Pay 1s. 2d. per day, all found; usual separation or dependents' allowance.

Overseas service.

Single as well as married men may be accepted for the M.M.G.S., provided they have not received notice to report at their local recruiting offices before the date of the M.M.G.S. inspection.

Applicants must be of good physique and possess good eyesight. Glasses do not debar necessarily men from service in this section, provided they can see quite well with them.

Those who desire to join immediately need not write at all, but should attend the Recruiting Office, Masonic Hall, Coventry, to-morrow (Friday) afternoon, 2.30 to 4 p.m., prepared to proceed to their training centre. Mr. Geoffrey Smith will be present to accept all suitable men.

In the latest list of recruits on this page are a number of Colonials, several of whom could drive cars. They were billeted in Coventry on Friday night, and proceeded to the training camp next day.

A list of men accepted last week for the Motor Machine Gun Service is given hereunder:

Ainger, H., Royston.	Hunt, D. G., Blandford.
Ballinger, A., Leamington.	Islip, G. A. K., Birmingham.
Bardill, H., Calverton.	Jones, J. H., Shrewsbury.
Beem, R. H., Hinckley.	Jowett, A., Bradford.
Bendle, W. S., Torquay.	Johns, J., Sheffield.
Beresford, G., Coventry.	James, W. H., Smethwick.
Binns, W. H., Moston.	King, J., Sandy.
Blackledge, G., Great Harwood.	Lyle, C. J., Portsmouth.
Boroughs, H., Cirencester.	Millward, —, Macclesfield.
Boughton, L. H., Birmingham.	Mansfield, C., Coventry.
Bridgwood, T., Macclesfield.	Marks, B., Leicester.
Brough, J. H., Middlesbrough.	Mills, E., Hinckley.
Burton, G. H., Wilberfoss.	Minifie, F. C., Peckham, S.E.
Barton, A., Long Sutton.	Myers, jun., J. B., Dalkeith.
Carter, C. W., Leamington.	Nelms, F. R., Coventry.
Cotton, S. E., Loughborough.	Norman, C. J., Coventry.
Clarke, F., Aston.	Norman, S. G., Handsworth.
Clarke, C. C. F., Louth.	Nutman, H. H., South Norwood, S.E.
Clark, J. W., Corbridge-on-Tyne.	Ouseley, G. R., Bournemouth.
Coffey, R. S., London.	Penny, W. H., Taunton.
Cooper, G., Edinburgh.	Powell, W. W., London.
Cox, D. B., Redditch.	Pullan, J., Ripon.
Cressey, W. S., Hull.	Ranson, F., Bowes Park, N.
Cummins, G. O., Birmingham.	Richardson, C. S., Forest Gate, E.
Craig, T. D., Chesterfield.	Robertshaw, W., Idle, nr. Bradford.
Croper, H. C., London.	Rood, B., London.
Daglish, A., Crook.	Sharp, T., Sheffield.
Eastwood, R., Great Harwood.	Shepherd, H. T. P., Chester.
Emsley, A. E., Morecambe.	Shilcock, W. B., Coventry.
Faulkner, E. L., Rotherham.	Sharman, B. A., Chesterfield.
France, J. E., Wallasey.	Stevenson, J. W., Bletchley.
Forward, E. R., Leicester.	Stokes, F. R., Malvern.
Foster, W. E., Mansfield.	Taylor, W., Skewen.
Gallagher, J. G., Ormskirk.	Taylor, S., Walsall.
Gatril, J. W., Grimsby.	Tunn, J., Olney.
Gifford, H., Grimsby.	Vickers, R., Birmingham.
Godfrey, R. C., Evesham.	Wagstaff, A. T., Birmingham.
Goodfellow, C. T., West Dulwich, S.E.	Walton, G. T., Wisbech.
Hackford, F., Lenton Sands.	Watson, J. O., Birmingham.
Harwood, J. W., Longfield.	Warwick, E., Leicester.
Hulme, H. D., Coventry.	Whitaker, F. B., Dollis Hill, N.W.
Humphreys, H. W., Gravesend.	White, A., Colchester.

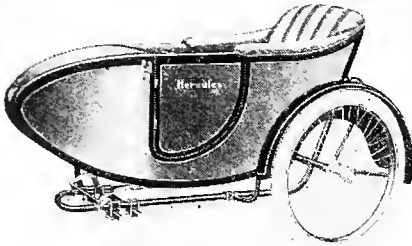
(See page 240 for M.M.G.S. application form.)



# THE HERCULES SIDECAR.

An Attractive Sidecar incorporating Several Novel Features.

**F**EW sidecars have a greater number of attractive features than the Hercules, manufactured by Messrs. the Hercules Motor and Cycle Co., Ltd., Birmingham. The chief aim throughout the design of the chassis has been the reduction of tubes and brazed joints, the result being lightness, simplicity, and considerable strength. The main frame of the chassis consists of one weldless steel tube constructed in U-



Coachbuilt model Hercules sidecar. Note novel type of front springing.

shape, the two free ends of which are then carried upward at the rear for some distance. Attached by two substantial lugs to the two uprights thus formed are the main wheel axle, which also forms the lower frame attachment, while above is situated another crossbar, which carries the spring shackle fittings, and the connection for attachment to the saddle stay of the cycle; this also forms the main support for the mudguard. By this arrangement the chassis is considerably dropped below the level of the axle, and the riding position of the body is placed extremely low.

## Three or Four-point Attachment.

Three points of attachment to the cycle are standard, but four may be obtained for heavy twin outfits if desired. The rear main connection is of the ball joint variety, and by this means perfect alignment is assured, as in whatever position the other connections are adjusted the ball joint ensures the axle being pulled

Storm apron, which can be fitted to Hercules sidecars.



up to correspond without throwing any strain whatever on either the sidecar chassis or cycle frame. The large nut can then be tightened and secured by a simple locking device. The front connection is formed on the principle of the self-centring lathe or drill chuck. A split sleeve is fitted over and pinned to the tube from the sidecar, which is attached to both sides of the main chassis frame. Externally this sleeve is slightly tapered;

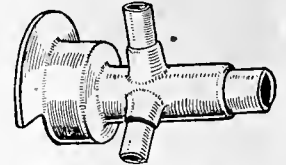
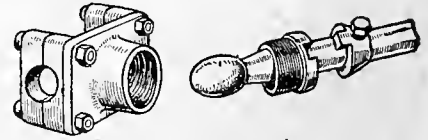
the lug attached to the cycle frame into which this tube and sleeve fit is also slightly tapered, so that when pulled up tightly by the locking nut, it forms a most solid connection, while the slight jamming action caused by the split tube attempting to expand overcomes any tendency for the securing nut to become loose. The third connection to the saddle pillar is attached to the upper rail of the rear portion of the chassis, and in order to prevent give or whip in this, a cross tube forming a triangulated connection, ensuring absolute rigidity, is fitted. This cross bar in no way interferes with the easy detachment of the connection.

## Mudguard Fixing.

The method of attaching the mudguard to the chassis is most noteworthy. This is carried out by bolting the guard by means of a substantial plate direct to the upper rail of the chassis. In addition to this it is secured by two stout stays both front and back, and the attachment thus obtained is absolutely rigid. The rear stay also forms a stand for the wheel when required. The hub is efficiently protected from water and mud by the addition of a neat extension of the axle lug, forming a cover and gutter which throws any mud and water that may run down the mudguard stays, etc., quite clear of the bearing.

The springing is well and neatly carried out, the body being supported on short, semi-elliptic springs in front, while the back is supported on the curiously arranged combination of semi-elliptic and C springs.

The bodies, which are of one shape only, can be obtained in almost any colour to match all the leading makes



Ball joint attachment (above) and hub guard combined with mudguard stay supports on the Hercules sidecar chassis.

of motor cycles, the finish being really excellent, and the makers claim that a man could see to shave himself comfortably in the glossy finish of the varnish.

## "TOUR OF THE JACK PINES."

Advance particulars that have reached us of a three days reliability trial, to be held next July by a Michigan, U.S.A., club, are of interest as showing the keen manner in which organising bodies of motor cycling competitions in America commence early to seek a large entry list. The Grand Rapids M.C. is the organising club, and 750 miles will be covered in three days. The trial is called "The Tour of the Jack Pines" by reason of a portion of the route embracing the pine forests of northern Michigan. We are told that "a 'place' in this universally important event should be the desire of every true red-blooded enthusiast."



## A WELL-DESERVED REST FOR DESPATCH RIDERS.

The men shown took part in the Dardanelles operations and are now doing duty at a base in Egypt. The photograph comes from Cpl. S. Langford, R.E., who, with Cpl. Leahy, of the same Signal Company, sends greetings to any riders of the company who may have returned to England.

## Obstacles to Overseas Exports.

Manufacturers' Experiences Invited. An Improvement in the Export Conditions Foreshadowed.

FROM time to time complaints have reached us from manufacturers concerning the difficulty in exporting motor cycles to countries abroad. It will be recalled that we have dealt with the subject on divers occasions of late, and urged the desirability of better facilities being granted to manufacturers to act upon the good advice of the Board of Trade to specialise on Overseas orders. From experiences which have reached us it is abundantly clear that there is often considerable delay in licences being granted from the Board of Trade to export motor cycles abroad, and also when these are obtainable a further delay ensues at the docks even if the manufacturer is lucky enough to persuade the railway company to collect the goods without delay. It would appear from information which has come into our possession that

an improvement in these transit arrangements may shortly be expected.

This announcement is made with considerable pleasure, as nothing to our mind is so empty as to appeal to manufacturers to capture enemy trade, and to specialise on exports to bring much needed gold into the country, when it is common knowledge that there are all sorts of real obstacles in the way.

Those manufacturers interested in the Overseas market, and who have experienced delays in the export of motor cycles or accessories abroad, are asked to furnish us immediately with particulars of specific instances where licences to export motor cycles have been refused, or where delays have occurred on the railways or at the docks. This information may expedite the improvement to which we have referred.

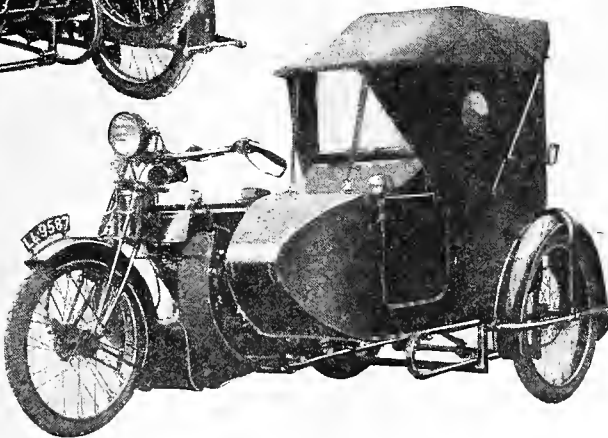
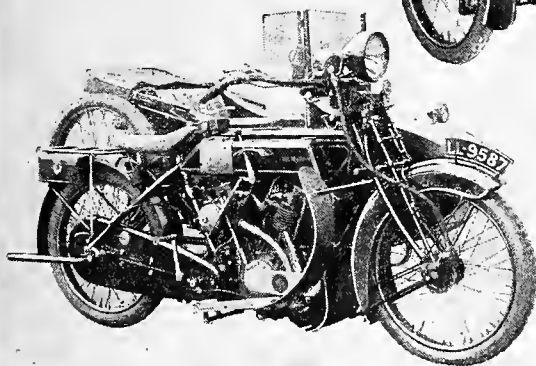
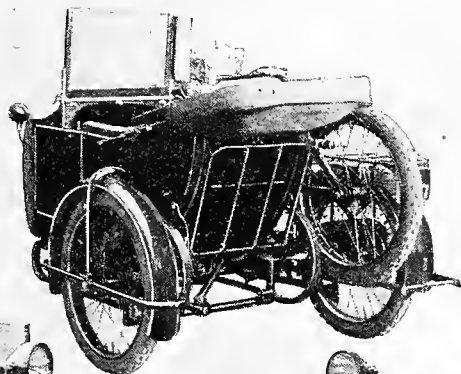
## A Luxurious Sidecar Combination.

A First-class Sidecar preferred to either Car or Light Car.

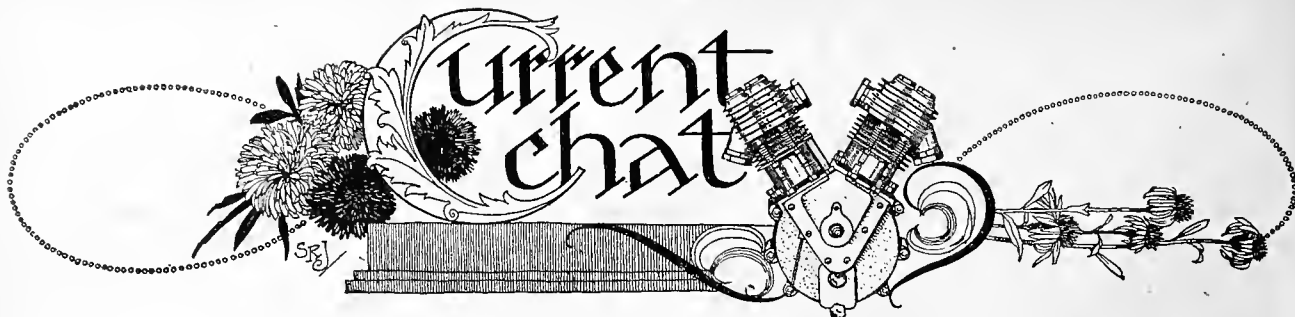
THE owner of the magnificently-appointed 8 h.p. 1916 model Sunbeam and sc. which we illustrate herewith is a sidecarist of many years' standing. Becoming ambitious he tried a light car, but was not at all satisfied with its slowness on hills, and so went in for a touring car. This he found too expensive to run, so, having come to the conclusion that a good motor cycle and sidecar is the most sporting passenger vehicle one can possibly enjoy at a minimum of expense, he decided to purchase the finest example of the type that money could procure. The outfit under consideration cost close on £160. It is, of course, splendidly equipped. It is finished in the well known Sunbeam all-black style, it has Lucas dynamo lighting, complete with lamps, horn,

switchboard, enclosed drive, A.K. knee grips, an electrically illuminated Stewart speedometer, and a most luxurious sidecar with hood, screen, and side curtains. The sidecar body is of beautiful design, carries the spare wheel attached to a special bracket, and has a spacious luggage carrier. The body itself is very roomy. One of the photographs shows the neat method of carrying the A.C.U. badge on the horizontal spindle of the front forks. This outfit was supplied by the Service Co., Ltd.

We have referred to the new 8 h.p. Sunbeam power unit quite recently. The engine is an M.A.G. twin-cylinder 8 h.p.,  $82 \times 94$  mm. = 992 c.c. Apart from the engine the 1916 8 h.p. Sunbeam remains practically the same as the 1915 6 h.p. model, which it replaces.



An expensive Sunbeam sidecar outfit. Note the spare wheel carrier, the novel place in which the A.C.U. badge is carried, and the side curtains provided for the hood.



## TIMES TO LIGHT LAMPS.

## GREENWICH TIME.

March	9th	...	...	6.21	p.m.
"	11th	...	...	6.25	"
"	13th	...	...	6.28	"
"	15th	...	...	6.31	"

## Motor Cycles at Woolwich.

The increasing use of motor cycles amongst Woolwich Arsenal workers is marked. They can store their machines in part of the premises, and garages and stores in the vicinity are also used. But for his motor cycle, one worker, who lives fifteen miles away in Kent, would need to live at Woolwich.

## Australian Half-mile Record.

L. Hope, of Perth, W.A., riding a  $3\frac{1}{2}$  h.p. Sunbeam, covered a half-mile at the beginning of the year in 26s. The previous record, 27s., was made by another Sunbeam rider, H. V. Norton, two years ago. In addition to being a Western Australian record, Hope's performance is, we understand, also a record for the whole of Australia.

## The Dublin Programme.

The question of holding competitions during the present state of national affairs has for some time past been exercising the minds of the committee of the Dublin and District Motor Cycle Club. The subject was brought to a head last week, when a special meeting of the committee was held to consider the matter of fixing a programme of competitive events. The committee decided to adopt the recommendation made to it by the general meeting, namely, to reduce considerably the number of events held last year and to confine the programme to the trials that have come to be regarded as the leading fixtures of the season. Consequently many of the minor events—those that partook of the nature of Saturday afternoon affairs—have been dropped, while the number of events at Portmarnock has been reduced to one. The usual open trials will be held at Easter and Whitsuntide, both of these being one day events, and at the August Bank Holiday the open two days' trial to Glengarriff and back will take place. The open twenty-four hours to Donegal and back will be held at the end of June, and a reliability trial will be held on St. Patrick's Day (the 17th inst.). The programme will probably be added to by a trial for prizes presented by Mr. R. J. Dodd, the hon. solicitor of the club, a corresponding event held last year proving very successful. Just at the moment the difficulty seems to be whether the usual competitors in Irish events will be able to secure any machines with which to compete in these events.

## The Wastage of Petrol.

A correspondent assures us that in a certain town in the South the sixty lorries belonging to the Army Transport Section have their engines run for an hour daily "to keep them in order." Our correspondent wishes to know whether we should advise him to adopt the same procedure with regard to his sidecar, so that the machine shall be in good tune when the war is over and he returns from his military duties.

## Sending Motor Cycles by Rail.

The attention of motorists is particularly drawn to the necessity of complying with railway requirements when vehicles are sent by railway. The byelaws covering the transit of motor cars and motor cycles by rail forbid the inclusion of any explosive spirit, and the companies are very strict in enforcing this rule. A motor cyclist member of the Automobile Association recently despatched his machine without removing all the petrol from the tank, and ultimately received a threat of legal proceedings from the company concerned. The Free Legal Advice Department of the Association was approached by the member, and correspondence ensued with the railway

## SPECIAL FEATURES.

THE WORKING OF A PETROL ENGINE.  
THE AERO ENGINE.

## A LUXURIOUS SIDECAR COMBINATION.

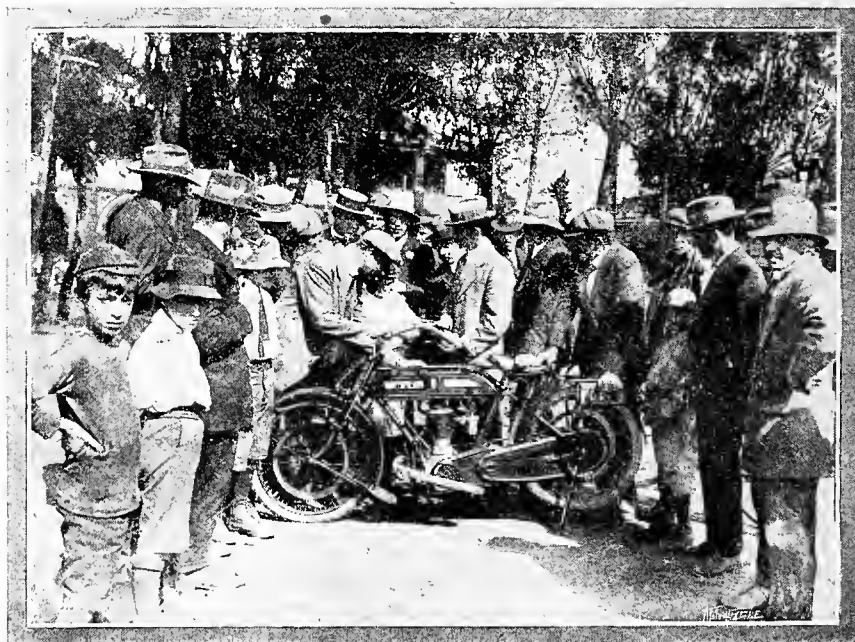
company, with the result that the company, as a special concession in this case, withdrew the instructions for proceedings to be taken against the member.

## A Date to Remember.

On Thursday, April 13th, *The Motor Cycle* annual Spring Number will appear. This is a week before the Easter holidays, and the issue will contain much information of interest and striking illustrations.

## "The Big Twin."

This is the title of a journal edited by present Etonians, and published by Spottiswoode and Co., Ltd., Eton. The first number, of which we have received a copy, is dated March 3rd, and even if subsequent numbers are no better *The Big Twin* should have a good following. The fifteen editorial pages contain a diversity of matter that is both instructive and amusing. We congratulate the editors on their first production, and wish *The Big Twin* the best of fortune.



## RECRUITING FOR MOTOR CYCLISTS IN SOUTH AFRICA.

Testing applicants for the motor cycle corps for the campaign in German East Africa. The machine is a 42 h.p. chain-driven B.S.A.

### Club Life in War Time.

The opening run of the Motor Cycling Club arranged for the 1st prox. was subsequently abandoned, though the Cyclecar Club recently carried out its opening run, and the same body now announces a "novel and easy form of competition for ladies."

### The National War Funds.

At the week end the principal national relief funds stood as follow:

The Prince of Wales's National Relief Fund (£3,073,000 distributed)	£5,803,558	0	0
Fund for the Sick and Wounded	3,417,069	0	0
Tobacco Fund	101,119	0	0
The Queen's Work for Women Fund	168,558	18	1

### Police Traps.

The Government is still bent on making "pleasure" motoring a pain. All round London, at any rate, the police continue their nefarious persecutions. There is a trap working at the Finsbury Park end of Blackstock Road, at the foot of a steep hill, and the trap is put just in a position where people would naturally accelerate before climbing this. Other Metropolitan traps too numerous to mention are being actively worked. We recently saw a motorist caught in Kensington High Street, the end of the trap being near the top of Victoria Road.

### Another Instance of Economy!

A clergyman living in a village in the Cotswolds uses his motor cycle for parish work at a cost, roughly, of 1s. per week. Now that the Government has restricted the supplies of petrol he finds that none is obtainable in his immediate vicinity, and he wrote to the A.C.U. for help in the matter, stating that if he could not get fuel for his machine he would have to hire a pony and cart at a cost of £1 per week. He concludes his letter by saying: "The Government, while telling people to save, is really driving them to extravagance." The A.C.U. has promptly placed him in the hands of its local repairer, and has ensured his now getting a regular supply.

### The Calthorpe Tank.

The unusual shaped tank used on the new Calthorpes (illustrated on page 203 of our last issue) is to be known as the Beta.

### The Petrol Supply.

Are we on the eve of petrol cards? All kinds of rumours have been floating about of late concerning Government intentions regarding the supply of petrol to the public, and now the most reliable information suggests that in the very near future petrol permits will be established.

### Sydney M.C.C. Twenty-four Hours Trial.

At the end of last year the Sydney, N.S.W., Club held a twenty-four hours trial. The start was from Sydney at 8 p.m., the final destination being Mount Victoria. The star performances were put up by the following three riders, who were the only ones to lose no marks:

A. E. Thomas (4½ h.p. B.S.A. and sidecar).

A. Biden (7 h.p. Harley-Davidson).  
J. Audsley (3½ h.p. P. and M.).

### 13,000 Miles to Enlist.

A motor cyclist recruit for the M.M.G.S. from Sydney, N.S.W., was aboard the *Clan MacTavish* when that vessel put up such a plucky fight with the German raider *Möwe*. The recruit in question is Mr. Arthur du Boisé, and an account of his interesting experiences will appear in our next issue.

### Economy.

The first poster issued by the War Savings Committee from the Public Trustee's Office begins with the words "Don't use a motor car and motor cycle for pleasure purposes. Don't buy new clothes needlessly. Don't be ashamed of wearing old clothes in war time. Don't keep more servants than you really need." Personally, we are never ashamed of wearing old clothes on a motor cycle, even for "pleasure" purposes. The other "Don'ts" don't concern us!



Sec.-Lt. H. Hegan, who enlisted in No. 5 Battery of the M.M.G.S. during 1914, and has recently been granted a commission.

## THE NATION'S PETROL SUPPLY.

### A Possibility of Petrol Permits.

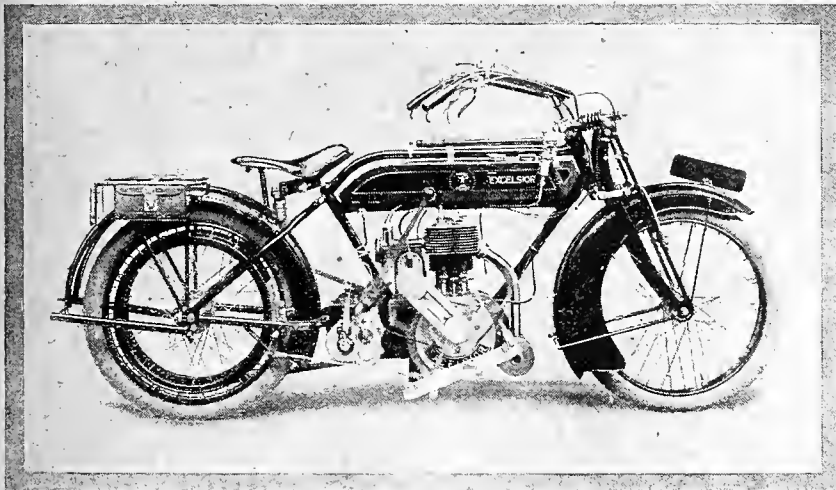
**W**HILE there has been no actual shortage of petrol in this country, and those in the South have had more than enough, it has occasionally proved difficult to procure it in the North, chiefly because the distribution has not been so well carried out. What concerns the motor cyclist at the present time is the possible restriction which may be imposed on the use of motor cycles. At the moment no definite news is obtainable, but motor cyclists should not be surprised to hear that petrol cards will be issued, upon which will be written the amount of fuel allotted to, and purchased by, each motorist during a given period, say a week or a month. Without showing the card it would be impossible to procure petrol, and the vendor would in each case write down the amount sold.

We can hardly think that the Government will prevent people using their motor bicycles to take them to the station, or to take them on their daily business rounds, nor would they grudge the petrol spent in taking out wounded soldiers for an outing in the country. It is likely, therefore, that for a purpose such as the latter an extra allowance of petrol would be granted. We should imagine that each motor cyclist who is able to get his business done on his allowance will not be denied the use of what is left for pleasure purposes, if he feel so disposed. All this, of course, is very indefinite, but we hope that soon the motor cyclist will really know how matters stand.

There are now quite a number of journals published in the war zone by amateur journalists serving at the Front. The latest of which we have received a copy is called *The Strafer*, written and printed by the men serving with an A.S.C. Ammunition Park attached to G.H.Q. The contents include information of the doings of the section and much humorous matter.

### A BIG SINGLE-CYLINDER.

The 1916 4½ h.p. 650 c.c. Excelsior, with countershaft three-speed gear. This type of machine will appeal to those desiring a powerful yet simple sidecar mount.





# The Action of a Four-s

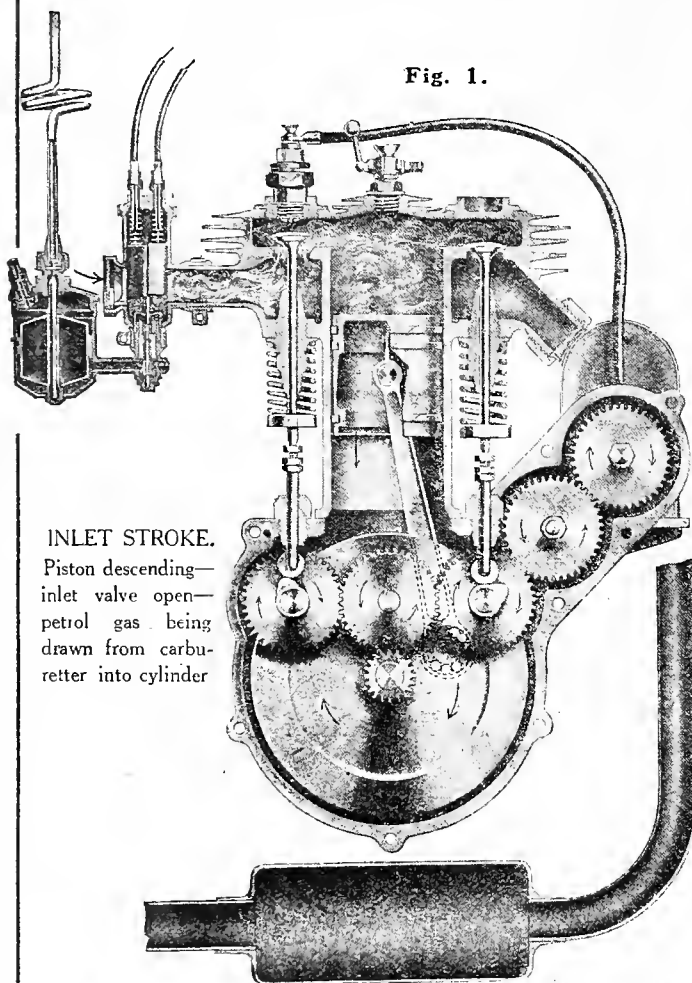
## The General Construction and Working Operation of a Motor Cycle

**I**N giving the following sectional illustrations and description of the four operations in the working of a four-stroke single-cylinder motor cycle engine, we have in mind the many newcomers and prospective newcomers to the ranks of motor cyclists, very many of whom, we know, have little or no knowledge of the inside construction and working of the petrol engine. The four-stroke engine is so named owing to the fact that in order to obtain one power stroke the piston has to perform four separate strokes, which means that the flywheels have to rotate twice to complete the cycle of operations. The main parts of an engine are as follow :

*The Cylinder.*—An inverted metal cylinder, closed at one end. It is usually constructed of cast iron, but sometime of steel. On the outside of this are cast a number of metal fins known as *radiators*; these are for the purpose of conducting away the heat generated when working. At the closed end are situated the two valves (*exhaust* and *inlet*) and the *spark plug*. This portion of the cylinder is known as the *combustion chamber*, being the part where the explosions take place.

The *piston* is the inverted jar-shaped portion, also usually constructed of cast iron; this works in the cylinder, practically forming a pump. This piston is connected to a met

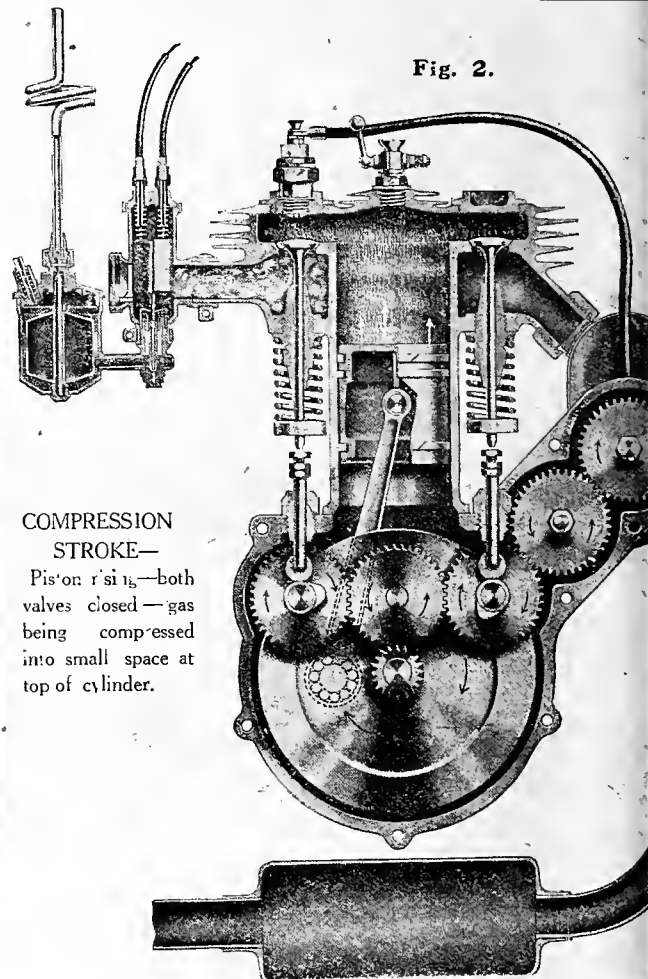
Fig. 1.



### INLET STROKE.

Piston descending—inlet valve open—petrol gas being drawn from carburettor into cylinder

Fig. 2.



### COMPRESSION STROKE—

Piston rising—both valves closed—gas being compressed into small space at top of cylinder.

**F**IG. 1 shows the first stroke of the engine, known as the induction stroke. It will be seen that the piston is descending. The cam situated on the left-hand timing wheel has lifted the inlet valve from its seating. The suction caused by the descending piston is drawing air through the carburettor—the instrument seen on the left. This, on its way, picks up a proportion of petrol vapour, and the whole enters the cylinder in the form of explosive gas. The inlet valve, owing to the shape of the cam, does not arrive at its full opening until the piston has descended about one quarter of its stroke. It remains wide open until

the piston has covered about threequarters of its travel when it commences to close, and by the time it has reached the end of its downward travel the valve has completely closed, leaving the whole cylinder full of petrol gas.

Fig. 2 shows the commencement of the compression stroke. The piston is now rising, and it will be seen that both valves are closed; therefore the gas which has been drawn in is being compressed into a very much smaller space, thus rendering it much more explosive. Just before the piston reaches the top of this stroke an electric spark is caused to jump across the points of the spark plug, igniting the cor

# Simple Single-cylinder Engine.

described in a Simple Manner for the Benefit of the Beginner.

rod known as a *connecting rod*. This again is attached to the *crank*, which is usually formed between the two *flywheels* situated in an airtight case known as the *crank case*, generally made of aluminium. The bearing where the piston is attached to the connecting rod is known as the *small end* bearing, while the lower bearing attached to the crank is called the *big end*, and is now frequently of the roller type shown in the illustrations. The two bearings supporting the crank and flywheels are designated the main bearings.

The *timing gear*, or two to one gear, consists of gears with exactly double the number of teeth as the pinion which drives them; they therefore rotate at half the speed

of the engine. On these gears are mounted the *cams*, which are pieces of metal with about one-quarter of their periphery raised above the general surface, and by means of these cams the valves are lifted when necessary. They are held closed normally by means of strong springs. The *magneto*, which generates the electricity for the spark, also runs at half engine speed.

The *carburettor* is the instrument attached to the inlet port by means of which the petrol is converted from a liquid into a gas by spraying it and mixing it with air. It consists of two parts, the float chamber and the mixing chamber.

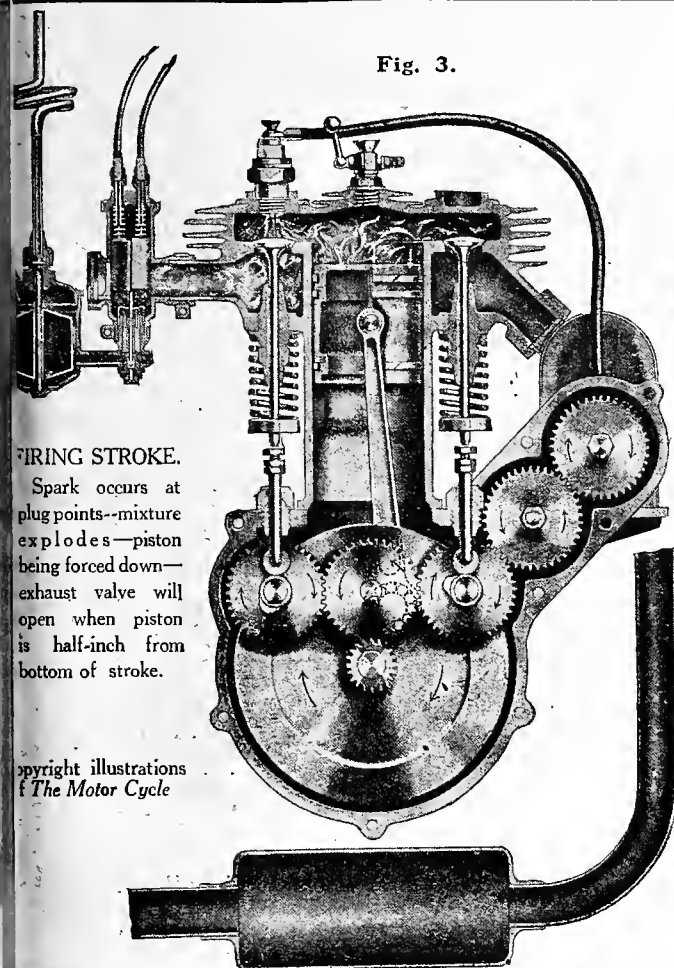


Fig. 3.

## FIRING STROKE.

Spark occurs at plug points—mixture explodes—piston being forced down—exhaust valve will open when piston is half-inch from bottom of stroke.

Copyright illustrations of The Motor Cycle

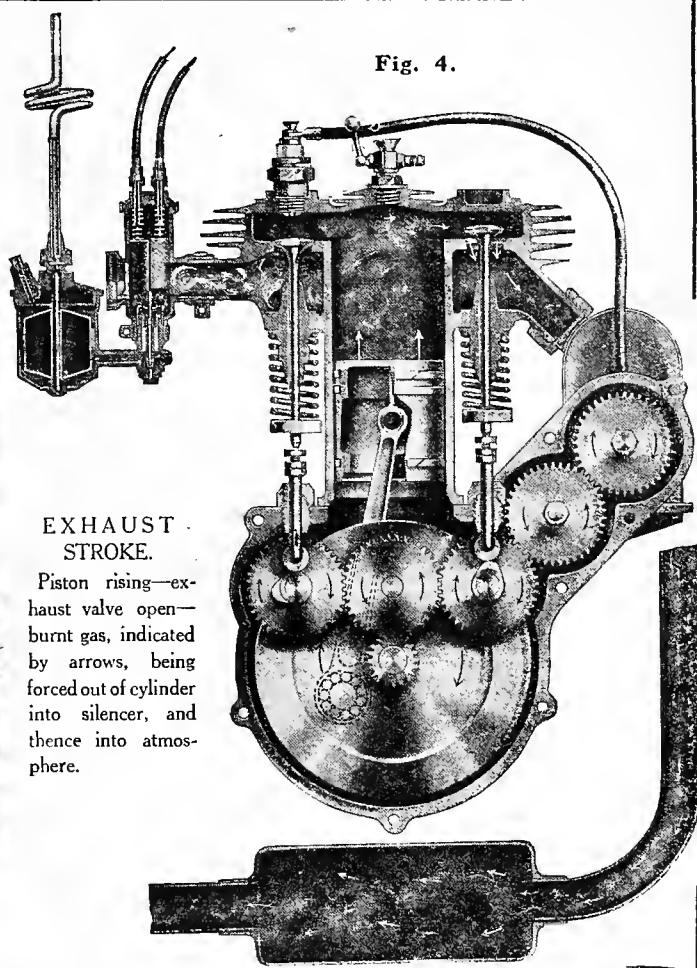


Fig. 4.

## EXHAUST STROKE.

Piston rising—exhaust valve open—burnt gas, indicated by arrows, being forced out of cylinder into silencer, and thence into atmosphere.

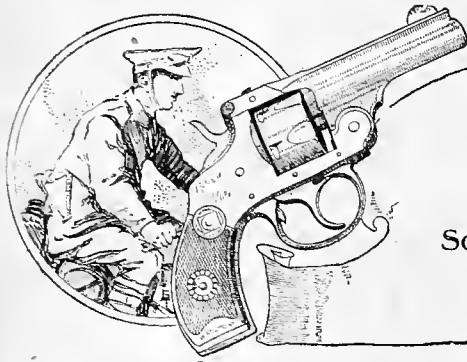
pressed gas, which then expands with considerable violence, forcing the piston down. (See fig. 3.) The power thus developed is transmitted *via* the piston and connecting rod, and causes the flywheels to rotate. This downward stroke is known as the explosion, or power, stroke.

When the piston has descended to within about half an inch of the bottom of this downward stroke the exhaust valve—the right-hand valve—will be just beginning to lift from its seating, and, although the piston will still be descending, a large amount of the burnt gas will commence to escape. The exhaust cam is always made a little longer

than the inlet cam, so that the exhaust valve is held open for more than one complete stroke of the piston.

The inlet valve remains open while the engine turns through 180° or 185° and the exhaust for 225°.

The next upward stroke of the piston, the commencement of which is seen in fig. 4, is known as the exhaust stroke, as the piston in its upward travel forces all the remaining burnt gas out of the cylinder through the exhaust port and into the silencer. The exhaust valve closes directly the piston reaches the top of the exhaust stroke; the inlet valve again opens, and the sequence of operations is repeated.



## ON DUTY.

Some Impressions and Experiences of a  
Motor Cyclist on Active Service.



**Y**ES, gentlemen, I am a hero, thank God! A hero of the purest water. No, sir! I was not at Ypres or in the retreat of Mons. In fact, I have never been in the danger zone, *proprement dite*. I have no story of bursting "Marmites" or holding up ten Boches with a cycle pump, yet I am as much entitled to the V.C. or the D.S.O. as any honoured despatch rider up-country.

I, too, am a despatch rider, although unkind friends call me a motor cycle orderly; I am attached to the advanced M.T. depot in one of the most important cities in France, working from 7 a.m. till midnight, riding in all weathers over the most God-forsaken *paré* that ever found its place in the sun.

Before revealing the dangers and perils of this heroic work I will initiate you in how to become a D.R.

The greatest moral asset is patience. Far away from the roar of battle one is inclined to vegetate, chiefly owing to the linger-longer waiting. Of course, unkind friends call me *blasé*, but to this a thousand denials. I am as misjudged as our old friend Bluebeard. He had as much right to slaughter his faithless wives as I have to slay with a coal hammer a faithless sparking plug.

*Voilà* a man with a secret in a closet and implicit faith in woman. What his secret was concerns us as little as it should have concerned his wife. It was probably a design for a motor cycle with a hookah carburetter, and he was off to the Patents Office to get his ideas covered. History relates that he came back in a bad temper because the rajah had not built a Patents Office, and could only offer him monopoly rights. His price was exorbitant. Five hundred silver khran, five hundred head of cattle, seven wives, twenty black slaves, and a King Dick spanner. Of course, he would not dib up, and we all know what happened to his wife when he returned and found out what she had been doing—prying into his closet and probably upsetting the steel and flint ignition timing.

### A Busy Life!

But I am wandering away from my story.

Here I am outside the office sitting in the gutter of the street, which the French girls next door call the "Brook" in their notes to me, waiting for despatches (and notes). It is terribly hot, and as I smoke a 25 centime Manilla cigar I gaze upon the five machines leaning idly against the kerb, waiting

for riders with despatches and perspiring petrol. Four of these motor cycles are in spick and span condition; even the nickel has been rubbed up. Of course the owners have nothing to do, whereas I am too busy to believe that a machine goes better because of stroking the mudguards with a wet sponge. The waiting makes me very bored. Of course I could get away for an hour or so on a joy ride (*alias* test), but my compression is rather poor for speed.

*Parbleu!* I have just been saluted by a Tommy. Saluted his superior officer sitting in the gutter. I am really only a private, but it is the moral duty of every D.R. to get himself up as like a hossifer as pos., with a cap badge darkened by French sulphur matches (wear your smoke helmet), the short coat issued, breeches, and leggings.

Motor cyclists out here also have a fashion of their own. *Noblesse oblige*. For instance, you must have knee pads, a Klaxon, a very noisy exhaust, umbrellas over sparking plugs, and T.T. handle-bars.

### Practical Jokes.

When calling, say, at the G.P.O., and another rider arrives and leaves before you in a hurry, be sure to examine your machine ere you bestride it. Something has been cooked. Either your petrol has been turned off, a pin in the h.t. wire touching frame, a cardboard disc behind gauze air intake, sugar in petrol, or compression cocks opened. One morning I opened the cocks of a Douglas left outside an office, thinking it was the machine of my blackest rival. However, it belonged to an officer, and when I passed him in the afternoon he still had those cocks open.

A head appears at a fourth storey window and bawls out "Orderly," so up the stairs I toil. Up, up, and up. How I know that winding staircase. Fifty-seven steps and a thick mat on the top! I have told him before to call me "Despatch Rider," but it boots him naught.

The order is to proceed to one of the swaggiest hotels in the town to inform a colonel that his presence is requested at the Base. He knoweth not the way, and asks me to direct him. Turning to his chauffeur, I overhear him say, "Follow behind this, er—officier, who will kindly show us the road."

And before entering the hotel I had said to the selfsame driver, "I say, old sport, is your bloke inside?"

-K.R.A.

Subscription Rates: Home, 6s. 6d.; all countries abroad, 10s. 10d. per annum.

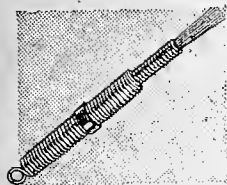
#### COLONIAL AND FOREIGN AGENTS

UNITED STATES—The International News Agency, New York. CANADA—Toronto News Co., Ltd., Toronto; Montreal News Co., Ltd., Montreal; Winnipeg News Co., Winnipeg; British Columbia News Co., Vancouver; Gordon & Gotch, Ltd., 132 Bay Street, Toronto.  
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SOUTH AFRICA—Central News Agency, Ltd. PARIS—Smith's English Library, 248, Rue Rivoli.

## AMONG THE ACCESSORIES.

### An Acetylene Burner Cleaner.

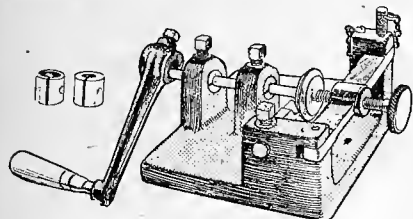
A USEFUL accessory lately placed on the market by Messrs. Herbert Terry and Sons, Ltd., Redditch, the well-known spring manufacturers, is



a wire brush for the purpose of cleaning acetylene burners. The brush has about forty wires of a diameter sufficiently fine to be inserted in the hole of an acetylene burner. It is held firmly in a closely coiled spring, which screws securely into a steel spring cover. When closed it is only 1½ in. long, and has a ring at one end, so that it may be suspended from a key chain or key ring. The price is 3d.

### The J.W.B. Valve Truer.

THE J.W.B. valve truer, which is sold by Selfridges, will appeal to the amateur having his own workshop. To keep the valve in position the door at the forward end is opened, and the valve is pushed in from that end stem first, it having been first ascertained that bushes corresponding with the diameter of the valve stem are inserted in the uprights. The door is then closed, and the pin inserted; next the



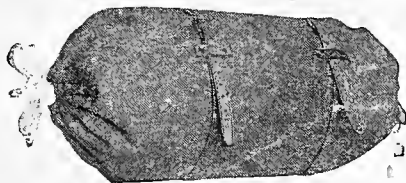
A valve truer that will appeal to the many riders who wish to keep their machines always in tip-top tune. It is sold by Selfridges.

handle is placed in position, and the adjustable stop at the forward end is screwed up. This serves to keep sufficient pressure on the face of the valve against the cutter. A tool of this kind, intelligently used, should be most useful for the private owner who does not possess a lathe, as it saves much grinding down of the valve seatings. Complete with the tool are supplied six different sizes of bushes to suit valves with stems of various diameters.

### Some Taylor Accessories.

QUITE a practical accessory which should appeal to the touring motor cyclist is a kit bag, which is just the size to be conveniently carried on the luggage grid. It has two compartments, in one of which may be carried a sponge bag and other odds and ends, and in the other a suit of pyjamas and spare under-clothing. It is made in proofed material, lined with oilskin, and should be completely waterproof.

Now that petrol has gone up so much in price it behoves all motor cyclists to take especial care not to waste the precious liquid. To this end Messrs. Taylor and Co. are specialising in a pourer designed to screw on to any petrol can. A filter and can opener is incorporated in it, and by its aid a can of petrol may be opened and emptied to the last drop without any waste from spilling, splashing, or evaporation—a worthy addition to the tool kit.



The Taylor double compartment kit bag.

Quite a useful preparation for sidecar bodies is Johnson's prepared wax, a preparation we have tried before on bodywork, and which may be relied upon to give a remarkably fine gloss to any body that, after long use, has assumed a dull appearance.

The above three mentioned articles are marketed by Messrs. H. Taylor and Co., Ltd., 21a, Store Street, Tottenham Court Road, W.C.

### A Pair of Practical Gauntlets.

AN objection to many gauntlets is that they take up so much room when folded into the pocket. Those sold by Messrs. the Bancroftian Co., 64, Bishopsgate, E.C., completely overcome this difficulty, as they are capable of being folded in the manner shown in the illustration. Their quality is excellent, and the leather is very soft and pliable.

Other specialities of the Bancroftian Co. are a good motor cycle waterproof suit, which is guaranteed to withstand the heaviest rains, and a woven leather body belt.



Bancroftian folding gauntlet gloves.

## Average Prices OF Second-hand Machines.

WE give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted, otherwise the last average is given.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S. ....	1915 6	3-sp. sidecar ..	—	£95
" .....	1914 6	3-sp. sidecar ..	£65	—
" .....	1913 6	3-sp. sidecar ..	—	£48
" .....	1915 2½	2-speed .....	£46	—
Allon .....	1915 2½	2-speed .....	—	£35
Ariel .....	1914 3½	3-sp. sidecar ..	—	£53
" .....	1913 3½	3-sp. sidecar ..	—	£44
Bradbury ..	1914 6	3-sp. sidecar ..	—	£63
" .....	1914 4	3-sp. sidecar ..	—	£47
B.S.A. ....	1915 4½	3-sp. sidecar ..	—	£72
" .....	1914 4½	3-sp. sidecar ..	£58	—
" .....	1913 3½	2-sp. sidecar ..	—	£44
" .....	1915 4½	3-speed .....	£52	—
" .....	1913 3½	2-speed .....	—	£32
Calthorpe ..	1915 2½	2-speed .....	£29	—
" .....	1914 2	2-speed .....	—	£16
Clyno .....	1914 6	3-sp. sidecar ..	£62	—
" .....	1913 6	3-sp. sidecar ..	—	£50
Douglas ...	1915 2½	3-speed .....	£43	—
" .....	1915 2½	2-speed .....	£40	—
" .....	1914 2½	2-sp. kick start	£43	—
" .....	1914 2½	2-speed .....	£37	—
" .....	1914 2½	2-speed T.T. ...	£37	—
" .....	1913 2½	2-sp. kick start	—	£32
" .....	1913 2½	2-speed T.T. ...	—	£32
" .....	1913 2½	2-speed .....	—	£29
Enfield ....	1915 6	2-sp. sidecar ..	£73	—
" .....	1914 6	2-sp. sidecar ..	£62	—
" .....	1913 6	2-sp. sidecar ..	—	£47
" .....	1915 3	2-speed .....	£40	—
" .....	1914 3	2-speed .....	—	£33
A. Excelsior	1914 7	2-sp. sidecar ..	—	£55
H. Davidson	1915 7	3-sp. sidecar ..	£80	—
Indian ....	1915 7	3-sp. sidecar ..	£65	—
" .....	1915 7	3-speed .....	£56	—
" .....	1914 7	2-sp. sidecar ..	£56	—
" .....	1914 7	2-speed .....	—	£44
" .....	1914 7	T.T. free engine	—	£44
" .....	1915 5	3-sp. sidecar ..	£64	—
" .....	1915 5	3-speed .....	—	£49
James .....	1915 4½	3-sp. sidecar ..	£57	—
Lea-Francis.	1915 3	3-speed .....	—	£63
Levis .....	1915 2½	de luxe .....	—	£37
" .....	1915 3	Popular .....	£25	—
Matchless ..	1915 8	3-sp. sidecar ..	—	£80
" .....	1914 8	3-sp. sidecar ..	£75	—
New Hudson	1915 6	3-sp. sidecar ..	—	£61
" .....	1915 2½	2-speed .....	—	£25
New Imperial	1915 2½	2-speed .....	£31	—
" .....	1914 2½	2-speed .....	—	£25
O.K. ....	1915 2½	2-speed .....	—	£30
" .....	1914 2	2-speed .....	—	£21
P. & M. ....	1914 3½	2-sp. sidecar ..	—	£50
" .....	1913 3½	2-sp. sidecar ..	—	£43
" .....	1913 3½	2-speed .....	—	£40
Premier ....	1914 3½	3-sp. sidecar ..	—	£48
" .....	1913 3½	2-sp. sidecar ..	—	£32
Quadrant ..	1915 4½	3-sp. sidecar ..	—	£60
Rex .....	1914 6	2-sp. sidecar ..	—	£48
Rover .....	1915 3½	3-sp. sidecar ..	£61	—
" .....	1914 3½	3-sp. sidecar ..	—	£47
" .....	1913 3½	3-sp. sidecar ..	—	£40
Rudge .....	1915 5-6	multi sidecar ..	—	£41
" .....	1914 3½	multi sidecar ..	£38	—
" .....	1913 3½	multi sidecar ..	£39	—
" .....	1915 3½	multi .....	—	£47
" .....	1914 3½	multi .....	—	£36
" .....	1913 3½	multi .....	—	£28
Scott .....	1914 3½	2-sp. sidecar ..	—	£49
" .....	1913 3½	2-sp. sidecar ..	—	£42
Sunbeam ...	1915 6	3-sp. sidecar ..	—	£66
" .....	1914 6	3-sp. sidecar ..	—	£80
" .....	1915 3½	3-speed .....	—	£63
" .....	1914 3½	3-speed .....	—	£52
Triumph ....	1915 2½	2-stroke .....	£36	—
" .....	1914 4	3-sp. sidecar ..	£53	—
" .....	1914 4	3-speed .....	£42	—
" .....	1913 3½	3-sp. sidecar ..	£45	—
" .....	1913 3½	3-speed .....	£36	—
Williamson	1914 8	2-sp. sidecar ..	—	£64
" .....	1913 8	2-sp. sidecar ..	—	£55
Zenith .....	1914 8	Gradua sidecar	—	£67
" .....	1914 6	Gradua sidecar	—	£56



## LETTERS to the EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

at this speed. Owing to the splendid steering this is quite easy to do.

The machine was used practically the whole time for despatch riding, and I never had a breakdown, although I only remember cleaning it about three times. On a cold morning the oil was very slow in coming out of the oil tank, and the back brake block wore out very quickly; also, the petrol lubrication was rather messy. Everything considered, however, I cannot imagine a more charming machine to ride, as its hill-climbing powers are phenomenal for a 225 c.c. engine, and it also has a good turn of speed—about 42 m.p.h. being its maximum, I think.

Since coming out here I have been riding a 1914 Triumph with a hub gear. This has proved a most reliable machine and has carried me about 8,000 miles, but I still prefer the Baby two-stroke.

GEOFFREY W. HILL.

(B.E.F.)

### Diesel Engines for Motor Cycles.

Sir,—Now that petrol has reached such a high price, would it not be advisable for our engineers to turn their attention to the Diesel engine as a means of motive power for motor cars and motor cycles?

I am not an engineer myself, so do not understand the possible difficulties in the way of this, but it seems to me that if they could be overcome we should have a marvelously cheap machine, seeing that the Diesel engine runs on crude oil, and would do away with all electrical ignition.

I should be glad if some engineer acquainted with the above engine would give us his views on the matter.

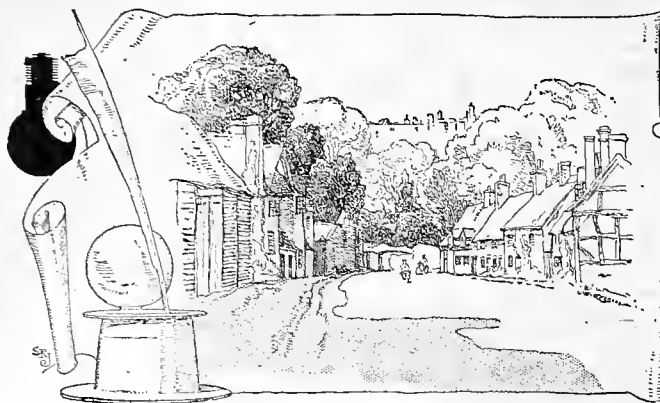
CHEAP FUEL.

### New Machines for Old.

Sir,—I enclose two photographs of a renovated Humber motor cycle rescued from the scrap heap. This was originally an inclined engine, and I thought it might interest some of your readers.

The alterations altogether cost about £25, all the work being done by myself, including cutting down the frame, making an extra stay for holding engine vertically, the cradle for the engine and magneto, etc. It makes a very compact machine, and brings the bicycle up to date. I have had two or three offers of £20 for it since it was finished.

W. WEBB.



### Baby Two-strokes up Freak Hills.

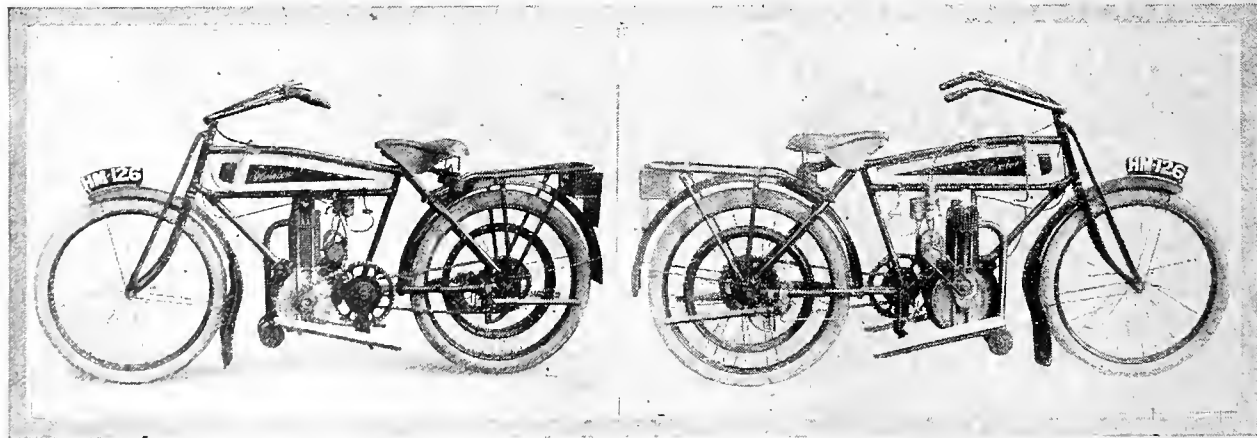
Sir,—With regard to "Ixion's" casual comments in your issue dated February 24th, I should like, as he suggests, to name a very steep hill which my small two-stroke will climb. I have a 1914  $2\frac{1}{2}$  h.p. Levis, 293 c.c., single gear, whose ratio is  $5\frac{3}{4}$  to 1. This machine will take me up a well-known gradient called Chances Pitch, which is on the Colwall side of the Malvern Hills, almost at the foot. At the steepest part of the hill there is a very nasty corner, and when this has been passed the rider has by no means completed his task; he has yet to go about threequarters of a mile up this steep gradient before he finds himself at the summit of the Malvern Hills, just near the historic British Camp. The Levis will only take me up this if my B. and B. carburetter is adjusted properly. I find that makes an enormous difference to my two-stroke (as "Ixion" says) in the matter of power on hills.

I hope you will have room in your splendid journal for this letter, as I think this performance is very creditable to my little machine, considering it is single-gear, and has been ridden a very long way. C.L.W.

Sir,—As "Ixion" asks for experiences of the hill-climbing powers of two-stroke "Babies," I am sending you mine. My machine was a Junior Triumph, delivered January 19th, 1915, and sold about April 12th (when I came out here), after covering slightly over 4,500 miles. The steepest hill of note which I climbed was Sutton Bank, which has an average gradient of 1 in 8 for nine-tenths of a mile, the steepest bit being reputed to be 1 in 3.9. This the Baby climbed easily after a non-stop run of over thirty miles. Gears,  $5\frac{3}{4}$  and  $8\frac{3}{4}$  to 1, with 24in. wheels.

My fastest run was from near Harrogate to Doncaster, a distance of forty-two miles, in 1h. 19m.—an average of over 31 m.p.h. At ordinary touring speeds I could get 95 m.p.g., sometimes 105.

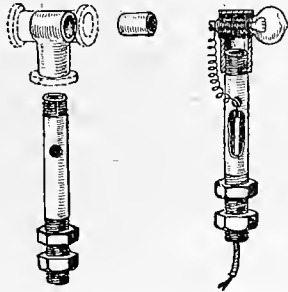
The vibration at over 37 m.p.h. was very objectionable, and I found it advisable to take the hands off the bars



An old chain-driven Humber which has been modernised by Mr. W. Webb. (See letter on this page.)

### Converting Acetylene Lamps for Electric Lighting.

Sir,—Having noticed in recent issues of *The Motor Cycle* several interesting methods for converting existing acetylene lamps into electric, I am sending you sketches of a simple and very neat device which I have made at a very small cost for altering my Lucas head lamp.



The following is the procedure to adopt: Take a 3in. gas tee piece and saw it off as shown. File out the inside until a small screw lamp holder will fit tightly into the tee piece. Next get a piece of brass tube (3in. or 4in. long according to size of head lamp) and screw and fit two nuts at the bottom end for attaching to lamp. Drill a hole to allow the insulated wire to come through to the terminal on holder. The frame provides the return path for the current. Fitted with a four-volt miniature bulb it will give a very good light with the lamp facing the mirror and reflecting forwards. The fitting can be silver plated if required and looks very neat.

E. SIMKISS (SEC.-LT.).

### The Removal of Cylinders.

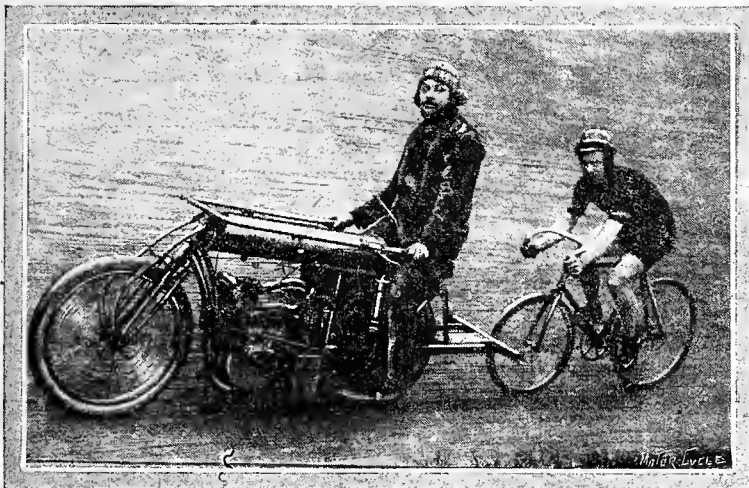
Sir,—We were interested to note the particulars of a patent in your issue of the 17th ult., by F. E. Etwell, Toronto, Canada, showing the tank and tube so designed as to be detachable, and allowing for the easy removal of motor cycle cylinders.

We, like many other motor manufacturers, are engaged to our fullest capacity on war work for Government purposes; consequently our motor cycle business has, more or less, to stand on one side. It must not, however, be thought that we have put aside our interests in the improvement of motor cycles. We have a machine which has now been running some ten months, and which has done several thousand miles, which is fitted with a detachable bar, identical to the particulars given in the patent above mentioned. This, we think, may be of interest to some of your readers. The development of this frame is only a matter which is held up by the present war conditions.

THE REX MOTOR MFG. CO., LTD.

GEO. H. HEMINGWAY, Managing Director.

Sir,—In your issue of February 17th you illustrate a motor cycle frame with a patent detachable tube under the tank. I would like to say that I have had such a bar in use for some years on a Rex loop frame, but I added this for strengthening purposes, as the frame mentioned had no tube in this position. To secure rigidity I designed the bar with



end clips brazed to angles suitable to the down tubes, and it is adjustable as to length by a sliding attachment with clip and bolt.

### VARIABLE GEARS.

In the same issue you show on page 164 a variable gear, which is very similar to one which I designed about eight years ago, but the medium in mine was thick-oil, instead of the small steel balls. My arrangement consisted of an epicyclic gear, with suitably arranged oil chambers and valves, and combined free engine, clutch, infinitely variable gear to direct drive, reverse and brake, and was designed for car use to be situated between the engine and propeller-shafts.

I gave the idea up, however, as I came to the conclusion that the whole thing worked more as a friction clutch than as a true gear, which I think will be found to be the case with the one you illustrate.

W. LEICESTER

### Spring Frames in Australia.

Sir,—I was considerably interested in your account of the Whiting spring frame, as detailed in *The Motor Cycle* of November 11th, 1915. It seems to me that the designer is on the right track.

I have now used my motor cycle (a 3 h.p. twin Enfield) for about 6,000 miles on Australian roads and bush tracks. It says a lot for the frame of the machine that it has stood the strain so well. But with a spring frame, such as the Whiting, I could maintain a higher average of speed with increased comfort and less wear and tear to the machine and rider. This is particularly the case in night riding, when we can less easily dodge the pot-holes.

It is like old days reading *The Motor Cycle* again. I read it at home *ab initio* until the summer of 1912. Recently I have rejoined the ranks, and am glad to see "Ixion" is going as strong as ever.

Might I add my small "squeak" to the chorus of discontent anent charges for spares for English machines and engines out here? I understand the users of American machines get very different treatment. Is this a tax on our patriotism? If so, could you spare a moment to drop a bombshell into the ring of those who are exploiting the market out here?

I wish you and *The Motor Cycle* every success, in particular your present campaign in favour of the spring frame.

(DR.) J. S. WATSON.

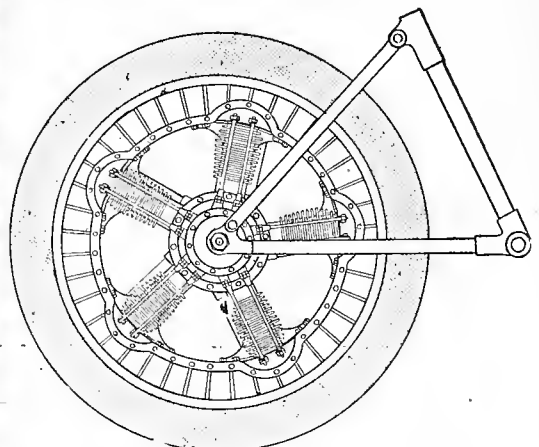
DUDLEY, NEW SOUTH WALES.

### Rotary Engines on Motor Cycles.

Sir,—I am a constant reader of your paper, and the interest with which you have invested the important question of rotary engines for motor cycles has encouraged me to submit an effort in this direction, which I enclose, and hope it may prove interesting to your readers. I am a well-known Belgian racer and pace-maker, also the chief in a big aeroplane construction works.

PARIS.

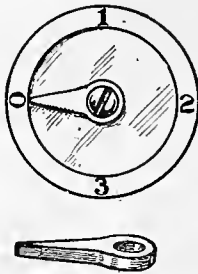
AUGUST GAETHOFS.



M. August Gaethofs, the writer of the letter on rotary engines. His design for a five-cylinder rotary engine situated in the rear wheel of a cycle is shown.

### A Drip Feed Improvement.

Sir,—I enclose sketch of an improvement I have made for the top of a drip feed regulator, which may be of use to your numerous readers. It is very difficult to adjust the drip feed in the dark and very often in daylight, as the oil frequently obliterates the figures. I have made a pointer of a piece of tin brass, drilled a small hole in the end just sufficient to allow the centre screw to pass through, and fixed pointer in "off" position. This can be adjusted in the dark, as the pointer will turn with the milled-edged regulator, and can be felt for position even with driving gloves on; and should extra oil be required over a certain route the drip feed can be regulated and replaced without risk of running dry or flooding.



SYDNEY J. FAIRLIE.

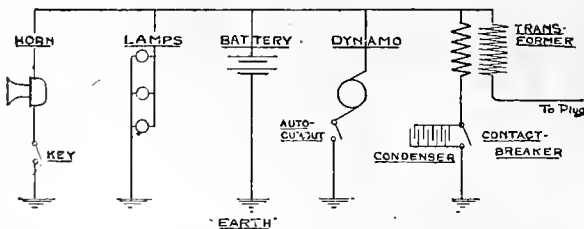
### A Suggested Electric Outfit.

Sir,—Without a doubt "Engineer" strikes the keynote to progress in the electrical equipment of motor cycles in combining lighting with ignition by transformer.

A dynamo—or generator, as "Engineer" prefers to call it—which need not weigh more than 6 lb. complete, will not only supply sufficient current for ignition, but at least six times as much as is required for that purpose, leaving the remaining five-sixths to be stored up for lighting. The case for combining the functions of two electrical generators in one machine is very strong, especially in the case of light-weights, where considerations of space and additional weight are all-important. Indeed, it is quite possible that these will be the determining factors after the war, when riders of lightweight and leviathan alike will clamour for electrical equipment.

I have been experimenting exhaustively during the best part of three years in the direction indicated by "Engineer's" letter, and he will therefore perhaps not resent a little criticism prompted by actual experience.

Disregarding for the time being the question of electrical starters as being unlikely to undergo satisfactory development for motor cycles, the wiring shown in the drawing accompanying "Engineer's" letter can be considerably simplified. To deal with the ignition circuit first, so far as the sinusoidal effect of alternating current is concerned, this is of no value in the present case, as it does not give that sudden and absolute collapse of the magnetic flux necessary to produce the hot spark required. Again, if the tappings off from armature to slip-rings are at the most advantageous angle, i.e., 180°, the potential difference even at the crest of the pressure wave would only be equal to that on the direct



current side. Added to this there is also the undesirable necessity for synchronism between the engine and generator, which eliminates the possibility of using that highly satisfactory drive for vehicle dynamos—the Whittle belt. As, therefore, the direct current delivered by a dynamo of ordinary construction will do all the work required, there would not appear to be any need for the complication of two separate circuits and duplicate sets of brush gear. The primary leads from the transformer (now our old friend the non-trembler coil" under a more scientific name) can be taken direct from the terminals of the generator—which should also be made integral with the automatic cut-out—so that it would be fed by the dynamo at ordinary speeds, but would have the help of the battery at low speeds and starting up. Now sweep away the whole of the negative wiring, substituting so-called "earth return"; put a con-

denser across the contact breaker, and the whole system is reduced to the simplicity shown by the diagram above. This is incidentally exactly as used by the writer since the early spring of 1914, with the exception that all connections are brought to a switchboard fitted with dynamo and lamp switches and a combined volt and ampere meter.

The single wire system may be regarded by the uninitiated as a weak point, but in many ways it is the strongest point in the whole system. Although not general in this country for vehicle lighting it is employed in the States in some of the highest class equipments, including that manufactured by the Westinghouse Co. Putting all other advantages aside, the neatness of the single wire system for motor cycles, where all wiring is more or less in view, is a point well worthy of consideration.

G. E. MORTLEY.

### Paraffin as a Fuel.

Sir,—I have read with interest the letters in your valued journal re using paraffin as fuel. I cannot understand the writers finding paraffin of any use, and I can only imagine that the advocates are simply riders who have found that paraffin will drive the engine. I spent much time in fixing up my 6 h.p. combination with two tanks, etc. The motor went, but I defy anyone to prove that it pulls well on a gradient, for the simple reason that the engine cannot be kept cool. Paraffin will do for lorry work with an elaborate water cooling arrangement. It took me a long time to get rid of the effects on valves, etc., and all I can say is that I do not intend to try paraffin again. I go 55 m.p.g. four up, and anyone who cannot afford this had better give up motor-ing. The difference in price between petrol and paraffin will be found to be nothing as compared with the loss in value of the engine after a few months' running. Every part of the engine will be badly worn. Another point, the smell when using paraffin was shocking. To use paraffin in an ordinary high-class motor engine is sheer abuse, and I wonder that makers of engines have not answered these letters.

T. H. WARD.

### APPLICATION TO JOIN THE MOTOR MACHINE GUN SERVICE.

Name .....

Address .....

Chest measurement ..... Height .....

Group No. .... or Age .....

Class No. ....

How long have you been a motor cyclist? .....

Can you execute running repairs? .....

Are you medically fit? .....

Occupation .....

WHAT DATE CAN YOU JOIN UP? .....

After filling in the above particulars return to:

MR. GEOFFREY SMITH,  
Inspecting Officer,  
19, Hertford Street,  
COVENTRY.

[Issue March 9th, 1916.]

Read carefully the instructions on page 229 of the Recruiting Section.



A selection of questions of general interest received from readers and the replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" on the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Rotating Engine without High-tension Wire.

**?** On testing the engine by pedalling to ascertain freeness, etc., is any harm done to the magneto by detaching the high-tension wire to the plug to prevent the engine firing? I am told harm is done to insulation. Is this correct?—C.L.

It is not a good plan to test the engine for any length of time by pedalling with the high tension wire detached unless the terminal is resting against some metal part of the frame or the engine, which will so allow the high-tension current to return without causing damage.

### Absence of Spark.

**?** My machine is a 1913 3½ h.p. single with a B. and B. carburettor. Owing to the bad state of the weather I have not ridden my machine for four weeks and so stored it in a shed. The other day, however, I thought of having a short tour, but when I got the machine out it was damp, and I could not start the engine. I then tried it on the stand, but with no success. Having in my possession the "Hints and Tips for Motor Cyclists," I paid attention to the sparking plug. I cleaned and rubbed it with petrol and adjusted its points, etc. The valves were both sound and working smoothly and timed correctly. The jet was also quite clear. Fearing a damp magneto, I warned it by putting a flame under it; carbon brush in proper condition. I tested for a spark, but could not see a sign of one, though the current is felt when turning the back wheel. When placing the plug on the cylinder and turning the wheel, should the spark be visible? When pushed along the engine turns freely, and all seems to be in working order. Before being laid up four weeks ago the machine worked splendidly.—J.E.

It is more than likely that your trouble is caused through the small rocker arm of the contact breaker sticking in its bearing due to the small fibre brush becoming swollen by the damp. This frequently happens when the machine has been laid up for some time during damp weather. If this is the case you should remove the rocker arm and free the bush by rubbing it with emery cloth wrapped round a match. We should advise you not to heat the magneto to dry it. If you suspect damp it should be stood in a warm room. Yes; the spark is visible if the back wheel is pulled over sharply. Care should, however, be taken that only the metal body of the plug is resting on the cylinder of the engine.

### Lack of Power.

**?** I shall be glad if you can say what is the matter with my 2½ h.p. horizontal twin. It is a late 1913 model. I have ridden about 20,000 miles. The engine was cleaned of carbon deposit in April, and in October began to slow on the hills, so I have had it taken to pieces by a man who does my work, and he found a quarter of an inch of carbon on the piston heads. Naturally, I thought I was going to fly once more, but, to my amazement, the machine will hardly climb at all. Unless I get a good run I cannot get over a canal bridge on top. Hills I used to fly up I can only get half-way, then drop to low. Often when I change down the engine will slow and finally stop, and the only way I can get going again is to put the engine in free, use the kick starter, and race it; after that the engine will go. The compression on the back cylinder is good, front cylinder very poor, so two new rings have been fitted, but with no better result. Plugs—Good. Spark—Excellent. Magneto points—Good, flat, and correct distance. Carbon brushes—Flat, clean, and springs good. The distributor the brushes bear against is quite clean. Tappets—Correct distance. Valves—All ground to their seatings. Carburettor—Been taken to pieces, everything quite clean, no stoppage of any kind. Jet used, 25. (I have since tried from 24 to 28, but 25 gives best results.) I used to get 120 m.p.g., but now only 80 m.p.g. All joints have been coated with thick oil, but no bubbles, however slight, appear. Timing—Never been changed or touched. Machine travels well on the level.—J.R.

Your trouble is certainly a curious one, as you have apparently tried practically every possible thing that can be wrong; but, of course, there is no doubt that there is some small fault which you have overlooked. We would recommend you to go over the machine systematically. Make sure that all the piston rings are a good fit and are not stuck in their grooves, that all the valves are free in their guides, and the springs are suffi-

ciently strong. You should go over all the other adjustments you have mentioned and make absolutely certain they are in order, and you should be sure there are no air leaks in the induction pipe. Bind all doubtful joints with insulating tape. Are you sure you are giving sufficient lubrication? The front cylinder on these machines is very apt to get starved, and it is usually this that causes the compression to be poor in the front cylinder. A considerable improvement in power will probably be noticed after the new rings have been run in.

### Hub Gear Sluggish Change.

**?** (1.) What can be wrong with my 1914 4 h.p. combination (three-speed hub) which has developed the following trouble: When on a fairly steep hill, and I wish to drop to middle or low gear, the exhaust valve is raised momentarily, according to instructions, and the gear lever moved to low or middle gear; the engine still appears to labour somewhat, and about ten or twelve seconds later a jerk takes place, and the engine only then is in low or middle gear. Now, this must be a severe strain on the engine, as the exhaust is dropped again, and the gear lever, of course, moved to the required position some time before the gear change takes place. (2.) Regarding the above-mentioned three-speed hub, sometimes on starting on low or middle gear from a standstill the clutch pedal is fully released, and yet the clutch does not grip until a few seconds later. The above points to a slipping clutch, and yet when the clutch is in, the rod is quite slack and moves ¼ in. before pressure commences to take the clutch out.—A.H.

(1.) We are afraid this question is not particularly clear. We can only think that the gear does not engage the moment the lever is pulled over; therefore, we should recommend you to change a little early, holding the exhaust up while the machine is slowing down, and then drop it. By that time we think you will find that the gear is fully engaged. The special symptom might be caused by changing a little too quickly, and not allowing the speed of the machine to fall to the speed at which it would be naturally propelled by the lower gear into which you are changing; or it is possible that the striker needs adjustment, or the spring actuating the moving parts is either broken or has lost its strength. Try washing the gear out thoroughly with paraffin, afterwards re-oiling with clean oil. (2.) The clutch might be washed out with paraffin and a little thin oil put in. This will probably improve matters.

THE  
MOTORCYCLE

ANNUAL SPRING NUMBER

WILL APPEAR ON

Thursday, April 13th.



**Drying a Magneto.**

**?** My old motor cycle has since August, 1914, been stored in a shed that is very damp, and I am now afraid to try it unless the magneto is dried out properly first. At what temperature should it be dried? Would a temperature of 200° Fahr. be too great for a Bosch magneto condenser?—P.S.

We see no reason for you to have to dry the magneto unless you are unable to get a spark at all. If the machine refuses to spark, and you suspect moisture, then, of course, it will be necessary to dry it. We would not advise you to submit the machine to a greater heat than about 120° Fahr. Unless you are in a hurry, we think you would find it sufficient simply to store the machine in a warm room for a few hours.

**Occasional Seizure.**

**?** I have a 1915 6 h.p. A.J.S. motor cycle, which I use in conjunction with a sidecar, and I have been troubled with an inexplicable difficulty ever since I had the machine in July last, and I should be very glad to have your advice on the matter. The trouble is temporary seizing of the front piston or the top ring; this invariably happens on a big throttle opening when driving up hill on top gear, or when doing any hard driving. The seizure is only momentary, and the engine starts up again immediately, and runs again quite sweetly and develops its usual power; also if the throttle is kept on a small opening the trouble is not apparent. After the first temporary seizing experienced I had the cylinders down, and noticed that the top ring of the front piston was stuck, and it was taken from the groove and thoroughly cleaned; but I also noticed that it was a very tight fit in the groove. I then eased the ring in order to make it a looser fit. I have now had this cylinder down several times; that is, on each occasion that I have experienced seizing, and the ring is eased off a little each time, until it is now quite a loose fit. The trouble has been more pronounced during the last few days, although I have been oiling copiously with Vacuum BB, as advised by the makers, and give two and a half pumpfuls in eight miles, until I get a smoky exhaust at times.—J.O.J.

We certainly think that your trouble is due to the fact that the front cylinder does not get enough oil. We should therefore recommend you, if possible, to have a connection so that a small quantity of oil flows direct to the front cylinder and adequately lubricates this piston separately. We think you would find this fitting satisfactory. As the ring now seems to be quite a loose fit in the piston grooves you should make sure that it is not a tight fit in the cylinder itself; when

the ring is fitted in the cylinder there should be about  $\frac{1}{2}$  to 1 mm. clearance between the two ends to allow for expansion. Make quite sure the lower rings are also an easy fit.

**Priming the Cylinder.**

**?** I should be obliged if you will kindly answer the following questions: (1.) What is the real object of injecting petrol when starting a motor cycle from cold? Is it to free gummy piston rings, or to ensure that there is petrol vapour to fire as soon as a spark occurs at the plug points? (2.) Is there any harm in injecting too much petrol into the cylinder at starting? Some makers say a few drops; others state in their catalogues, do not be afraid to inject plenty of petrol to ensure an easy start.—W.R.M.

(1.) The petrol performs the two functions—it frees the gummy piston and also leaves a certain amount of petrol vapour in the combustion chamber. (2.) It is best not to inject too much petrol, as it washes away the lubricating oil. Just a squirt out of an oilcan is quite enough.

**Unable to give Full Throttle.**

**?** My machine is a 1915 2½ h.p. New Imperial two-speed. I took the engine down, cleaned off the carbon behind the rings, and also ground in the valves. I fitted new inlet valve guide and valve, as the old ones were badly worn, and put the engine up again. Trouble. After starting I can open the throttle fully (by degrees, of course), but when the engine is hot I cannot open the throttle a quarter, if I do the engine either stops altogether, with perhaps only two explosions, or stops without a single fire, just as if I had applied a magneto cut-out—a fitting I do not possess. I will, for your guidance, enumerate below a few things which I do not think can cause this, as I have already attended to them. Valve clearances quite in order. Petrol getting to carburetter all right. Have tried different levels—no result. The new valve is a very loose fit in the new guide. Cannot be magneto, or how is it I can do well over 40 m.p.h. before the engine heats up? I have had the engine down again, ground in valves. The baffling part of the mystery is that the trouble only manifests itself when the engine is at normal running heat, and it will run indefinitely and perfectly without a single miss on the restricted throttle opening.—W.H.W.

It is possible that your trouble is due to faults in either the plug or carburetter. If the compression is good and the valves are not sticking the spark and carburation are the only other points which can possibly cause the trouble. If the trouble is ignition, it points more to the plug being faulty and unable to withstand the extra heat and pressure of the further

opening of the throttle. You should also make sure there are no stoppages in the carburetter. A slightly choked jet might cause the trouble, water, or some foreign matter floating in the petrol which gets drawn up into the jet and then falls back again. Make sure there are no air leaks. Bind all doubtful points with adhesive tape. Really the only satisfactory way of finding out is to go over each item systematically, beginning with the plug and carburetter. You should also make certain that, in cleaning your carburetter, you have not enlarged the jet at all.

**READER'S REPLY.****Slow Running.**

Re query of "M.R.S." in *The Motor Cycle* of January 20th regarding slow running of the 1915 5 h.p. twin Indian. If "M.R.S." makes sure that he has no air leaks around the joint between the inlet valve cages and domes and at manifold nuts he should not have any trouble, and if he retards the spark slightly he should be able to get slow running. A smaller pilot jet would not help him much, as the size fitted is only found after experiment and trial by the test department.—W. J. EDWARDS, Springfield, Mass.

**EXPERIENCES WANTED.**

"W.W." (Edinburgh).—Binks' fuel.  
 "E.C." (Portsmouth).—F.N. 5 h.p. 1915, also Zenith 5-6 h.p. 1913. Petrol consumption, solo and sidecar.  
 "S.T.B." (Sussex).—2½ h.p. T.D.C. de Luxe. Consumption, speed, hill-climbing capabilities with fixed gear, and reliability.  
 "J.J.M." (Castlehayney).—1915 4 h.p. A.J.S. and 3½ h.p. Sunbeam for sidecar work. Reliability, consumption, speed, and cost of upkeep.

**RECOMMENDED ROUTES.**

**ISLE OF GRAIN TO BERKELEY.**—C.H.B.  
 Isle of Grain, Rochester, Leybourne, Wrotham Heath, Ightham, Riverhead, Westerham, Redhill, Dorking, Guildford, Odiham, Hook, Basingstoke, Kingsclere, Newbury, Hungerford, Marlborough, Broad Hinton, Wootton Bassett, Malmesbury, Tetbury, Dursley, Berkeley. Approximately 160 miles.

**LIVERPOOL TO CANTERBURY, VIA ST. ALBANS.**—G.H.

Liverpool, ferry to Birkenhead, Sutton, Chester, Broxtown, Whitchurch, Ternhill, Newport, Woodcote, Weston-under-Lizard, Gailey, Four Crosses, Brownhills Common, Muckley Corner, Fazeley, Atherstone, High Cross, Kilsby, Daventry, Towcester, Dunstable, St. Albans, Hatfield, Hertingfordbury, Hertford, Hoddesdon, Waltham Cross, Wake Arms, Epping, Chipping Ongar, Brentwood, Ingrave, Orsett, Tilbury, ferry to Gravesend, Rochester, Chatham, Sittingbourne, Canterbury—approximately 290 miles.

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In view of the decision of the Government to limit the import of material for the manufacture of paper it is imperative that every possible step should be taken to avoid waste of paper in any form. It has been the custom in the past for newsagents to order a certain number of papers for chance sales, and these copies if unsold become what are known as "returns"; in other words, waste copies.

In the case of "THE MOTOR CYCLE" the percentage of returned unsold copies has been remarkably low, but in order to conserve the supply of paper in future it is desirable that the waste of copies, ordered to accommodate occasional purchasers, shall as far as possible be eliminated.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in this matter by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

MOTOR CYCLES FOR SALE.

Bat.

- BAT-J.A.P., 5hp., Mabon clutch, spring frame; bargain, £12.—Earl, 5, Heath St., Hampstead. [X4277]
- BAT-J.A.P., 6hp., 2-speed gear, tyres and belt newly new; £35, or nearest offer.—Geipel, 2, Duncombe Place, York. [X2225]
- BAT, 1914, 8hp. J.A.P., 3-speeds countershaft, in perfect order, speedometer; £38.—Percy and Co., 337, Enston Rd., London. [X2229]
- BAT, 1913, 6hp., with Montgomery sidecar, completely done up by makers 1915, and new sidecar chassis added; £30.—Browning, 196, Bedford Hill, Balham. [X4219]

1916 Bat and Sidecar, 8hp. twin J.A.P., 3 speeds, luxuriously and completely equipped, run under 50 miles; cost £110, best offers.—Stone, Park Garage, Thornton Rd., Clepham Park. [X1619]

BAT-J.A.P. 1913 8hp. Combination, all accessories, sidecar new coach; 47 gns.; generous deferred payments, liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X2043]

BAT, 1915, brand new, 4.5hp. twin, sporting model No. 1, 2-speed countershaft gear, French grey finished; list price £60/7/6, special price for cash £55.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X0597]

Bradbury.

BRADBURY 1916 Models.—Agents, Bright and Hayles, 73, Church St., Camberwell Green. [X2059]

4hp. Bradbury, 2-speed, F.E., speedometer, sidecar; £30.—40, St. John's Park, Holloway, N. [X4207]

BRADBURY, 1912, 3½hp. N.S.U. gear, free engine, accessories, good condition; £23.—Adams, Speenhamland, Newbury. [X4078]

1913 Bradbury, 4hp., T.T., new tyres and belt, all accessories, perfect; £21, or nearest.—198, Moulsham St., Chelmsford. [X2026]

BRADBURY, 4hp., 1911, free engine, semi-T.T. model, complete; £22/10.—Morgan, 44, West Side, Wandsworth Common, S.W. [X2112]

BRADBURY 1914 3-speed Combination, hood, screen, lamps, speedometer; 63 gns.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X2044]

1910 3½hp. Bradbury, 1914, Mark VII, 3-speeds, lamps, horn, good tyres and tubes, been well cared for; war bargain, £25.—Rooks, 22, St. Leonard's Av., Hove, Sussex. [X2108]

FOR Sale, 1914 Bradbury motor cycle, 4hp., 2-speed gear, free engine, in both clutch and pulley, sidecar, coachbuilt, good condition; £40.—Nelson, Rainwall, Seawley, Brigg. [X1945]

31hp. Bradbury, mag., lamps, horn, etc., perfect condition, £13/10; also 2-seater coachbuilt sidecar, suit 6hp., £9/10; bargains.—274, Gloucester Rd., Horfield, Bristol. [X2115]

BRADBURY, 4hp., 2-speed countershaft, and coachbuilt sidecar (hood and screen), tyres good; £35, or exchange with cash for higher power combination.—168, Invicta Rd., Sheerness. [X4245]

Brough.

BROUGH, 1915, 3½hp., T.T., exceptionally fast, splendid order in every way; accept for quick sale (no offers) £48.—Embro Cycle and Motor Co., Charlotte St., Hull. [X1930]

1916 T.T. Brough brand new, unpacked, cost £63; unable to take delivery; can be seen at Harris's Garage, Rugby; reasonable offer accepted.—Cobbold, 15, St. Leonard's Av., Stafford. [X4054]

Brown.

21hp. Brown Motor Cycle, 26in. wheels, good tyres, running order; 70/.—Bond, E. Dereham. [X4274]

B.S.A.

SHREWSBURY Agent for B.S.A.; delivery from stock.—J. C. Pickering. [X3445]

B.S.A., 1916.—Both models in stock, or for immediate delivery.—Moss, Wem. [X4203]

B.S.A., 1915½, 4½hp., model H. combination; £68.—Mitchell, 35, Ronnday Rd., Leeds. [X4248]

JULIAN'S, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all B.S.A. models. [X2634]

B.S.A. and coachbuilt sidecar, with spares, etc., as new; £42.—Logan, 283, Camberwell Rd., London. [X3720]

B.S.A., 1916, second-hand, ridden 300 miles, all chain, 3-speed; £60.—Bond, 245-247, Euston Rd., N.W. [X4214]

B.S.A.—City Depot for B.S.A. motor cycles, Colmore Depot, London Agency, 44, Finsbury Pavement, E.C. [X2135]

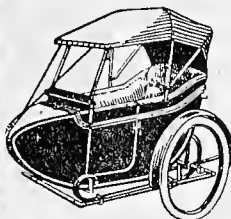
1916 B.S.A. Model H, 3-speed, all chain drive, with or without sidecar, just delivered.—Plastow, Grimsby. [X4206]

1913 B.S.A., 2-speed, in perfect order; £32; gnatn food, cash payment arranged.—Jones, Orange Muswell Hill, N. [X2240]

B.S.A., 1915, 4½hp., 3-speed, countershaft gear, chain-cum-belt, complete; £48; no exchanges.—Laytons' Garage, Bicester, Oxon. [X4151]

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3½ h.p. LEA-FRANCIS, 1915, nearly new, 3-speed, kick starter, Hercules £13 10s. Sidecar; £5 ss. speedometer, £3 10s. lamp set; the whole cost £94 10s. .... £85 0  
2½ h.p. WOLF, 1916, 2-stroke, 2-speed ..... £33 10  
4 h.p. WOLF, 1916, 3-speed, chain drive ..... £45 15  
2½ h.p. LEVIS, 1915, 2-stroke, 2-speed ..... £25 15  
3½ h.p. HUMBER, 1914, 3-speed model, with Sidecar ..... £39 15  
3½ h.p. LINCOLN-ELK, 1912 model ..... £15 15  
1913 HUMBERETTE Cycle Car, hood, screen, electric lamps, 3 speeds and reverse, good tyres ..... £55 0  
3½ h.p. RUDGE, 1912, free-engine model ..... £19 15  
2 h.p. 1915 O.K., 2-speed, nearly new ..... £23 15  
3½ h.p. SINGER, 1912, 3-speed model, with cane Sidecar ..... £25 0  
2½ h.p. MINERVA, spring forks ..... £6 15  
3 h.p. HUMBER Tricar ..... £5 5  
1½ h.p. WOLF, 1912, magneto ..... £9 10  
4½ h.p. JAMES, 1911, 3-speed, with James coach Sidecar, lamps, and horn ..... £45 15  
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6½ h.p. DE DION Light 2-seater Car ..... £15 15  
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3½ h.p. PREMIER, 1916, 3-speed model with £13 ros. coach Sidecar, only run 100 miles ..... £68 15  
3½ h.p. PREMIER, 1911, B.S.A. 2-speed ..... £19 15  
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MOTOR CYCLES FOR SALE.

B.S.A.

B.S.A., 1914, 4½hp., 3 speeds, clutch, and kick starter, chain drive, excellent condition; £48.—P. J. Evans, John Bright St., Birmingham. [X2079]

B.S.A., 1914½, 4½hp., 3-speeds countershaft, and coachbuilt sidecar, perfect condition; £50, or close offer.—Percy and Co., 537, Euston Rd., London. [X2231]

1915½ B.S.A. Combination, hood, wind screen, P. lamp set, horn, speedometer, etc.; any trial; first offer near £58 cash.—Upton, Brentwood. [X4191]

B.S.A., 1916, 4½hp., countershaft, chain-cum-belt models; we can deliver from stock at £62 cash, or deferred payments.—Laytons' Garage, Bicester, Oxon. [X4152]

B.S.A., 1916, 4½hp., chain-cum-belt, 3-speed, used only twice, and guaranteed as new; cost £62 February 4th, will accept £56.—Tollady, Bicester, Oxfordshire. [X4153]

1912 3½hp. B.S.A., 2-speed, clutch, T.T., new cylinder, piston, connecting rod, bearings, speedometer, horn; £35; seen by appointment.—E. D. Lloyd, 28, Murray Rd., Enghy. [X4122]

B.S.A., model H £64, model K £62, actually in stock; generous deferred payments, liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X2048]

B.S.A., 1915, countershaft, and coachbuilt sidecar, speedometer, best offer over £55; B.S.A., 1912, 2-speed sidecar, Lucas lamp, speedometer, Lucas horn, £27.—Wilson, Victoria Park, Cambridge. [X2211]

B.S.A., 1914, 4½hp., countershaft, all chain model, equipment includes sidecar windscreen, 2 lamp sets, Junior Long horn, etc.; price £50.—Laytons' Garage, Bicester, Oxon. [X4150]

B.S.A., late 1915, model K, very little used and in excellent condition, Lucas lamp, model 351, Smith's Rock-steady speedometer, accessories cost £9; will sell complete £52/10.—Box No. L908, c/o The Motor Cycle. [X2202]

B.S.A.—New 1916 models from stock; inspection cordially invited. All-chain drive £64, chain-cum-belt transmission £62, fitted with B.S.A. countershaft gear, free engine, and kick start; B.S.A. sidecars to fit, £16; gradna payments entertained; second-hand machines taken in exchange; generous allowance; tuition and free delivery. Buy from B.S.A. appointed agents. Phone: Holborn 5777. When dealing with Wanchope's, purchasers can deal with confidence.—Wanchope's, 9, Shoe Lane, Fleet St., London (just off Ludgate Circus). [X4237]

Calthorpe.

SHREWSBURY Agent for Calthorpe's; all models in stock, or for early delivery.—J. C. Pickering. [X3446]

CALTHORPE, latest model, 2-stroke, 2-speed, lamps, like new; 24 gns.—Davies, 52, Gauden Rd., Clapham. [X2016]

CALTHORPE-J.A.P., 1915, 2-speed, T.T., lamps, hardly used; £26.—11, Luna Rd., Thornton Heath. [X2120]

CALTHORPE, new latest pattern, 2-stroke, 2½hp., with special mag.; £28/16.—Seen at 248, Bishopsgate, London. [X2164]

CALTHORPE-PRECISION Junior, 2-speed, 1914, perfect condition, horn; any trial; £16/15.—J. Payne, Crich, near Matlock. [X3723]

1915, Calthorpe-Jap, 2½hp., 2-speed, excellent order, not done 1,000 miles, all accessories; £28/10.—Coochey, 30, Aisleby Rd., Lee, S.E. [X1967]

CALTHORPE-J.A.P., one only, brand new 1915 lightweight model, at 10% discount; secure this bargain at once.—Walton's Garage, Worthington. [X1904]

CALTHORPE Motor Cycles, 1916 Models—Just arrived: 2-stroke 2-speed 31 gns. J.A.P., 2½hp., 2-speed 36 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [X0777]

CALTHORPE—Big value for little money. Every model in stock at the Colmore Depot's London Agency, 44, Finsbury Pavement, E.C., and 121, High Rd., Kilburn, N.W. [X2137]

CALTHORPE-J.A.P.'s, with Enfield gear, £37/16; also two bargains, 1915 2-stroke, 2-speed, 1916 engine, £30/10, and 1915 2½hp. 2-stroke, 1916 engine, £27/14; liberal deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X2050]

CALTHORPE, 1916 new lightweight from stock, improved design, fitted with J.A.P. engine and Enfield 2-speed gear, £37/16; identically the same machine without 2-speed gear, £32; 2½hp. 2-stroke, 2-speed model, £32/11; extended payments arranged.—Wanchope's, 9, Shoe Lane, Fleet St., London [X4238]

Campion.

CAMPION 2-stroke Motor Bicycle; £20; owner suddenly ordered to France.—Apply to Sir Francis Osborne, Bt., The Grange, Framfield, Sussex. [X4075]

Chater-Jap.

CHATER-J.A.P., 2½hp., 3 speeds and clutch, reliable solo mount, complete with accessories; £19.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X0492]

CHATER-J.A.P., unnsed, specially built frame, strong wide chassis, enclosed wheel, suitable for delivery work, 8hp., 3-speed, Bosch, 3in. and 700x80 tyres, also 2 C.B. bodies, 1 single, 1 family, with hood and screen; cost over £125, £85, no offers.—Box L899, c/o The Motor Cycle. [X1976]

## MOTOR CYCLES FOR SALE.

## Chater-Jap.

**CHATER-LEA-J.A.P.** 8h.p. Combination, late 1913, accessories, perfect; £55, near offer.—Bacher, 156, New King's Rd., Fulham. [2030]

**1915-16 Chater-Lea-Jap.** 8h.p., overhead valves, long stroke, lightweight steel pistons, special 2in. nickel exhaust pipes, nicely tuned 4 to 80 m.p.h., consumption 78 to gallon, finished black and gold, splendid condition; £56.—Flight Sergt. Patterson, R.F.C., Port Rowner, Gosport. [2015]

## Chater-Lea.

**CHATER-LEA.** 5-7h.p., clutch, 2-speed countershaft, coach sidecar; £27.—47, Leigh Rd., East Ham. [2144]

**CHATER-LEA** 1913 O.B. Combination, all grey, 6 h.p., 2-speed, F.E., speedometer, lamps, horn, mirror, Whittle belt; £35.—W. S. Bastiant, Watton House, Hertford. [X4079]

**CHATER-LEA.** 1913, 7-9h.p. J.A.P. engine, 3-speed countershaft, all chain drive, coachbuilt sidecar, hood, and wind screen, also Pillion seat, P. and H. head lamp, speedometer, horn, in splendid condition; £55, or near offer.—Baines, 30, Mandrake Rd., Upper Tooting. [2008]

## Chater-Lea-Antoine.

**CHATER-LEA-ANTOINE.** 1915 cylinder and piston, 4h.p., B. and R. h.b.c., Splindorf mag., Grado gear and free engine, N.A.B. seat-pillar, Bruid forks, and tyres nearly new; £18/10, or offer.—Apply, Chauffeur, Dawpool, Thurston, Birkenhead. [X4134]

## Chater-Lea-Fafnir.

**£10/10.**—Chater-Lea-Fafnir, m.o.v., mag., splendid condition.—22, Leyton High Rd., Stratford. [1965]

## Chater-Lea-Quadrant.

**FIRST** Cheque £12 secure.—34h.p. Chater-Lea-Quadrant, ready to ride away.—Chauffeur, Farm House, Oxshott, Surrey. [1966]

## Chater-Lea-Sarolea.

**6h.p.** Twin Chater-Lea-Sarolea, 1911 B. and B. carburettor, 2-speed gear, free engine, handle starting, low 16in. frame, B104 saddle, Chater-Lea spring forks, Bosch mag., new 1in. Lyso belt, 26x2 1/2 Hutchins, powerful, fast, good condition, enamelled, plated recently, all accessories, wicker stylish sidecar, side door, covered nose; bargain lot. £19.—45, Charles St., Commercial Rd., E. [X4200]

## Clyno.

**CLYNO.** 1914, spare wheel, accessories; £65.—Duffield, 195, Cambridge Rd., Mile End. [1929]

**CLYNO.** 1914, 6h.p., 3-speed, spare wheel, lamps, horn, speedometer, new C.E. sidecar, hood, screen, all in perfect condition; £60.—17, Limes Av., North Finchley. [2095]

**1915** Clyno Combination, 3 speeds, and spare interchangeable wheel, Lucas lamps, tyres very good; any trial given; £65, lowest.—Mortimer, Brookend House, Weland, Worcestershire. [X4057]

**1914** Clyno Combination, 6h.p., 3 speeds, kick starter, interchangeable wheels, speedometer, Klaxon, lamps, accessories, new condition; bargain, £65.—15, Albert Rd., Walthamstow, Essex. [2123]

## Connaught.

**SHREWSBURY** Agent for Connaughts; early delivery.—J. C. Pickering. [X3447]

**CONNAUGHTS** in stock, immediate delivery.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1990]

**CONNAUGHT** 2 1/2h.p., 2-stroke, hub 3-speed gear, free engine, lamp, horn; £25.—Bond, 245-247, Easton Rd., London. [X4213]

**CONNAUGHT.** 2 1/2h.p., late 1914, 2-speed, perfect condition, all accessories; bargain, £23.—16, Camden Rd., Wanstead. [2114]

**CONNAUGHTS** in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £28/7.—P. J. Evans, John Bright St., Birmingham. [2076]

## Douglas.

**DOUGLAS.** 2 1/2h.p., V, 2 or 3-speed, in stock; from £50/8.

**DOUGLAS.** 2 1/2h.p., U, 2 or 3-speed, in stock; from £50/8.

**DOUGLAS.** 2 1/2h.p., W, 3-speed, clutch, in stock; £56/14.

**DOUGLAS.** 2 1/2h.p., N, ladies', kick start, in stock; £56/14.

**DOUGLAS.** 2 1/2h.p., War Office model, in stock; £54/12.

**DOUGLAS** Agents and Specialists. Latest models at rock-bottom prices. Lists on application. T.A.: Bicycles, Tel.: 338.—Robinson's Garage, Green St., Cambridge. [6866]

**1915 1/2 T.T.** Douglas, good tyres, all accessories, 2 speeds; £28.—Newington, Eden Bridge. [X4215]

**1914** Douglas nearly new; owner existing; bargain; £35.—Mills, 4, Wood Side Parade, N. Finchley. [1942]

**DOUGLAS.** 1914, 2-speed, lamps, heavy tyres; cheap, £31.—11, Luna Rd., Thornton Heath. [2121]

**1915** Douglas, in good running order, guaranteed; a snap, £13 13.—Jones, Garage, Muswell Hill N. [2241]

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SUN-VILLIERS, 2 1/2 h.p., single-speed	£30 10
SUN-VILLIERS, 2 1/2 h.p., 2-speed ...	£37 0
JAMES, 2 1/2 h.p., 2-speed ...	£38 11
NEW RYDER, 2 1/2 h.p., 2-sp. J.A.P.	£33 12
ZENITH, 4 1/2 h.p., countershaft ...	£73 18
B.S.A., 4 1/2 h.p., 3-speed, all chain ...	£64 0
B.S.A., 4 1/2 h.p., ditto, chain-cum-belt	£62 0
CALTHORPE, 2 1/2 h.p., 2-sp., 2-str.	£32 11
SUNBEAM, 3 1/2 h.p., 3-speed ...	£73 10
INDIAN, 5 h.p., 3 speeds, Model B ...	£70 0
INDIAN, 7 h.p., 3 speeds, Model C ...	£78 0
ENFIELD, 3 1/2 h.p., 2 speed, T.T. ...	£52 10
ENFIELD, 6 h.p., Combination ...	£89 5
LEVIS, 2 h.p., Popular model ...	£32 0
B.S.A., 4 1/2 h.p., and No. 2 Sidecar ...	£80 18
ENFIELD, 6 h.p., electrical model ...	£105 0
MORGAN, 8 h.p., de Luxe, all equip.	£117 18 3
ROYAL RUBY, 2 1/2 h.p., lady's, 2-sp.	£38 0
ROYAL RUBY, 2 1/2 h.p., 2-sp., 2-str.	£36 10
COVENTRY EAGLE, 2 1/2 h.p., 2-sp.	£36 18
COVENTRY EAGLE, 2 1/2 h.p., 2-sp.	£44 2
CALTHORPE-J.A.P., 2 1/2 h.p., 2-sp.	£38 17
J.H., 2 1/2 h.p., 2-stroke, 2-speed ...	£39 5 6
CALTHORPE, 2 1/2 h.p., lady's, 2-speed	£37 16

A number of New 1915 machines to clear at a reduced price. Full particulars upon request.

## SECOND-HAND.

## SIDE CAR MODELS.

SUNBEAM, 8 h.p., 1914, 3 speeds ...	£85
REX, 1914 (late), 3 speeds, 6 h.p. ...	£52
REX, 6 h.p., 1914, 2 speeds, de Luxe ...	£46
B.S.A., 4 1/2 h.p., 1915, 3 speeds ...	£68
TRIUMPH, 1911, 3 1/2 h.p., clutch, and So.	£22
TRIUMPH, 1912, 3 1/2 h.p., 2-speed ...	£32

## SOLO MOUNTS.

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LEVIS, 1914, 2-speed, 2-stroke ...	£24
RUDGE, 1914, 3 1/2 h.p., T.T., Multi ...	£42
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KERRY-ABINGDON, 3 1/2 h.p., 2 speeds ...	£22
REX, 3 1/2 h.p., vertical engine ...	£6
REX, 1909, 3 1/2 h.p., 3-sp., handle start	£21
P. & M., 1913, 3 1/2 h.p., 2-sp., handle start	£35
VELOCETTE, 1915, 2 1/2 h.p., 2-sp., 2-str.	£32
ZENITH, 1913, 3 1/2 h.p., clutch ...	£38
DIAMOND, 1914, 2 1/2 h.p., 2 speeds ...	£30
DOUGLAS, 2 1/2 h.p., 1913, 2-speed ...	£34
DOUGLAS, 2 1/2 h.p., 1914 (T.T., 2-sp.), lamps, speedometer ...	£38
RUDGE, T.T. Multi (Isle of Man Model, 1915), 3 1/2 h.p., lamps & horn	£48

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1916 MORGAN de Luxe, hood, screen, side lamps, rear lamp, mechanical horn ...	Price £117 18 3
STANDARD, 9 1/2 h.p., 1914, all equipment, as new, dickey ...	£188
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OVERLAND, 1916, Model 86, electric light and starter, 5-seater ...	£200
CADILLAC, 1914, 20 h.p., 5-seater, electric equipment and self-starter, excellent order ...	£250
SUPER, 7-9 h.p., twin, w.c., 6 speeds, speed model ...	£78
MORGAN G.P., No. 1 Model, 1916 ...	£119
MORGAN G.P., mag. eng. mod., 1916	£118 19
WILLIAMSON Cy-clen, hood & screen	£126
LUCAR Light Car Coupé, 10 h.p., 1915	£210

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## MOTOR CYCLES FOR SALE.

## Douglas.

**DOUGLAS.** 1914, T.T., 2 1/2h.p., 2 speeds, very fast; £34.—Percy and Co., 337, Euston Rd., London. [2230]

**1914** Douglas, T.T., perfect condition, fully equipped; £37.—Svanse, 4, Fennel St., Manchester. [X4233]

**10** GNS. for 1910 Douglas, running order, but wants re-bushing.—Troward, Heathurst, The Vale, Hampstead. [1891]

**DOUGLAS.** 1910, low frame, overhauled, new tyres and belt; £14.—56, Cuthles Rd., Balham Hill. After 7 p.m. [2138]

**DOUGLAS.** 1915, Colonial model, 2-speed, clutch, kick start, lamps, horn; bargain, £43.—Ideal Cycle Co., Thundersley, Essex. [2085]

**DOUGLAS.** late 1914, T.T., 2 speeds, fully equipped; a mount equal to new; £37/10.—436, Whitehorse Rd., Thornton Heath. [2099]

**DOUGLAS.** 2 1/2h.p., fine machine; seen running; sacrifice, £14/10, near offer.—A. Speechley, 45, Church Rd., Acton. [2199]

**2 1/2 h.p.** Douglas, 1914, 2-speed, clutch, little used; offers; exchange.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X4139]

**DOUGLAS.** 1915, immediate delivery any 2 1/2h.p. model, including War Office black Douglas.—Moffat, Yeovil. Tel.: 50. [9203]

**1913** Douglas, 2 1/2h.p., 2-speed, fully equipped, exceptional good condition; £28; seen any time.—5, Green Terrace, Rosebery Av., E.C. [X4256]

**DOUGLAS** and Accessories, perfect; cost £57 December, going abroad; first cheque £35; genuine snap.—Sergt. Blair, Puffin Cup, Shorecliffe. [2210]

**IMMEDIATE** Delivery Douglas 3-speed, 1915, as new, £47/10, fully equipped, identical as latest 1916 models obtainable.—Gibb, Gough, Gloucester. [1189]

**1914** Douglas Model U, nearly new tyres, engine overhauled, footboards, upturned T.T. bars; £34/10.—Robinson's Garage, Green St., Cambridge. [0613]

**DOUGLAS.**—City Depot for Douglas motors, Colmore Depot, London Agency, 44, Finsbury Pavement, E.C., and at 146, Seven Sisters Rd., N. [2136]

**DOUGLAS.** 1914, 2 1/2h.p., 2-speed, recently fitted pistons and rings, new Dunlop hand tyre and tube, all complete; £33, cash required.—Leslie Barry, Dundee. [X4117]

**DOUGLAS.** 2 1/2h.p., 1913 1/2, T.T., 2-speed, footboards, condition perfect throughout, good tyres; bargain, £31.—Ayers, Old Barracks, Kensington Palace. [1961]

**DOUGLAS.** 1915, 3-speed, lamp, horn, speedometer, footboards, etc., only used three weeks; £52, or nearest offer.—Motor Mart, Tennyson Rd., Eastbourne. [2155]

**DOUGLAS.** late 1913, 2 1/2h.p., 2-speed, lamps, complete, tyres excellent condition, perfect; £34.—103, Cornwall Rd., Tottenham. 'Phone: Tottenham 175. [2177]

**DOUGLAS.** 1912, 2-speed, free engine, very little used; £30; speedometer, horn, lamp, kit bag of tools included.—Blackburn, Little Thakeham, Pulborough, Sussex. [X4123]

**1914** 2 1/2h.p. Douglas, 2-speed, free engine, kick starter, F.R.S. lamp, horn, accessories, etc., little used, perfect condition; £40.—E. Bentley, Murray St., Llanelli. [X4177]

**DOUGLAS.** 1912 1/2, just re-bored, re-bushed, and thoroughly overhauled by makers, engine as new, good tyres and belt, accessories; £25.—Tweedell, Victoria Rd., West Hartlepool. [X4236]

**DOUGLAS.** new 1916, 2 1/2h.p., model V, 2-speed, only ridden 250 miles, Cowey speedometer, Lucas horn, head and tail lamps; £50.—Lloyd, 171, Cranbrook Rd., Ilford. Enlisted. [2100]

**DOUGLASES** in Stock.—Model V 3-speed £52/10. War Office £54/12; special deferred payment, if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2045]

**1914 1/2** Douglas, T.T., 2 speeds, Lucas 3-in. lamp, set, rear light, spare belt, A.K. knee-grips, extra bag, usual tools, very good condition; £39.—Hill, 9, Britannia Terrace, Saltburn, Yorks. [1928]

**DOUGLAS** War Office Model, new this year (makers' despatch ticket shown), complete with 2 lamps, mechanical horn, long exhaust pipe fitted, and specially tuned; bargain, £50.—Ideal Cycle Co., Thundersley, Essex. [2086]

**DOUGLAS.** 2 1/2h.p., 1914 model W, clutch, kick start, tyres good, belt new, Binks and spud lamp, equipment, spare chain, reliable machine for daily use; best offer over £34.—Dr. Garrett, Municipal Offices, Cheltenham. [1917]

## Enfield.

**ENFIELD** 2 1/2h.p. Twin; £12.—Garage, Larkhill Camp, (1980)

**ENFIELD** 1916, 3h.p. twin, 50 gns.; delivery from stock.—Below.

**ENFIELD** 1916 6h.p. Combination, 85 gns.; delivery from stock; liberal exchange terms.—D. J. Shepherd and Co., Enfield Highway, N. [1940]

**JULIAN'S.** Broad St., Reading. 'Phone: 1024.—Immediate delivery of all Enfield models. [X2835]

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LEVIS, 2½ h.p., 2-stroke ..... £32 0  
SUNBEAM, 3½ h.p., 3-speed ..... £73 10  
SUNBEAM, 8 h.p., 3-speed ..... £94 10  
EXCELSIOR (American), 7 h.p., 3 speeds ... £75 0  
CALTHORPE Minor 10 h.p. 2-seater .... 185 gns.  
MORGAN de Luxe and accessories ..... £117 18  
NEW IMPERIAL, 2½ h.p., 2-speed ..... £36 15  
NEW IMPERIAL, 2½ h.p., variable magneto £37 18  
OVERLAND, new, 12 h.p. model, 2-seater . £220 0  
OVERLAND Touring Car, electric starter . £275 0  
DOUGLAS MODELS ..... Orders booked now

## (U.S.A.) EXCELSIOR.

1916, 7 h.p., twin, 84" x 89, mechanical and hand lubrication, kick starter, high-tension magneto, spring forks, 2-gallon petrol capacity, 3-speed countershaft gear, multiple disc clutch with hand and foot control, handle-bar control, spring seat-pillar, 3in. non-skid tyre, finish Excelsior grey; latest 1916 model, £75.  
Exchanges quoted. Easy payments arranged.  
We are sole Yorkshire distributors. Liberal terms to trade.

## NEW 1915 MODELS.

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\*WOLF-J.A.P., 2½ h.p., 2-speed ..... £37 0  
\*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke ... £36 10  
\*ROYAL RUBY, 2½ h.p., 2-speed ..... £39 10  
\*ROYAL RUBY, 6 h.p., 3-speed ..... £37 0  
\*U.S.A. EXCELSIOR, 7 h.p., dynamo lighting £71 10  
\*Cash offers wanted.

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1914 2½ h.p. 2-speed F.R. CLYNO, 2-stroke . £28 10  
1914 3½ h.p. 3-speed ARNO ..... £29 10  
1913 3½ h.p. ROVER, 3 speeds ..... £27 10  
1913 3½ h.p. ROVER, Grado gear ..... £27 10  
1912 3½ h.p. ZENITH-GRADUA ..... £26 10  
1912 3½ h.p. 2-sp. BRADBURY, chain drive £29 10  
EXCELSIOR, 3½ h.p., 3-speed, Druid forks . £19 19  
2½ h.p. 2-speed DOUGLAS ..... £24 10  
TRIUMPH, 3½ h.p., clutch model ..... £21 10  
KERREY, 3 h.p., magneto, Saxon forks ..... £12 10  
N.S.U., Twin, 2-speed, spring forks ..... £15 10  
REX, 3½ h.p., magneto, spring forks ..... £14 10  
DOUGLAS, 2½ h.p., twin, spring forks ..... £16 10  
TRIUMPH, magneto, spring forks, new tyres £18 10  
MINERVA, 2½ h.p., magneto, variable gear £11 10  
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W.C. WILLIAMSON and Sidecar (new) ... £89 15  
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1912 3½ h.p. 2-speed PREMIER and Sidecar £33 10  
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MORGAN, 1914, Sporting, hood, screen, etc. £82 10  
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## MOTOR CYCLES FOR SALE.

### Enfield.

ENFIELD Twin Lightweight; £12/12; exchange for safe and office furniture.—Bassett, Doncaster. [X3773]  
2½ h.p. Enfield, 1911, new tyre, good order; 13 gns. to clear.—Troward, Heathurst, The Vale, Hampstead. [1892]

ENFIELD 1914 Combination, hardly used, looks new; £66/10.—McKenzie, Bargoed Terrace, Trebarrys. [2227]

ENFIELDS, 6h.p., 3h.p., electric Model de Luxe, in stock.—Newton's, Manchester sole agents, 5, Blackfriars St. [X2715]

ENFIELD Lightweight Twin, 1912, just repainted and thoroughly overhauled; £18/10.—Walbro Motor Co., Ely, Cambs. [X3971]

ENFIELD Late 1915 6h.p. Combination, complete with lamps, etc., condition as new; £65.—3, Carson Rd., W. Dulwich. [2053]

LATE 1915 Enfield and sidecar, absolutely as new; present owner enlisting; £70.—Mills, 4, Wood Side Parade, N. Finchley. [1947]

ENFIELD 2½ h.p. Twin, accessories, new tyre and belt, good running order; £12/12.—Mylam and Co., 197, London Rd., W. Croydon. [2130]

ENFIELD, 8h.p., 1915½, Lucas sets, Watford, shield, screen, etc., Stelastics, everything good; £70.—Smith, 500, Goswell Rd., E.C. [2132]

ROYAL Enfield for sale, 3h.p. twin, 1915 model; owner on active service; price £45, or nearest.—Box 175, c/o The Motor Cycle. [2004]

ENFIELD Combination, 1913, speedometer, screen, spare combination tyre, 3 electric, 1 acetylene lamp, good condition.—26, Matthew St., Battersea. [2011]

ENFIELD, 1916, 2½ h.p., 2-stroke, 2-speed, and free engine, complete, Lucas spares, new condition; £38.—P. J. Evans, John Bright St., Birmingham. [2077]

ENFIELD Combination, good condition; £45, or exchange 3½ h.p. or lightweight and cash.—Wardle, Aberford Rd., Woodlesford, Leeds. Tel.: 48 Rothwell. [X4197]

1912 6h.p. Enfield, special wide coachbuilt sidecar to seat 2, accessories, etc.; £45, cash or easy terms.—R. E. Jones (Garages), Ltd., Synnsea, London, Cardiff. [1072]

1916 3h.p. Enfield, 2-speed, new 2 weeks ago, and only used 3 times; great bargain, £42/10; owner at front.—Alexander's, 115, Lothian Rd., Edinburgh. [1932]

ENFIELDS actually in stock for immediate delivery, combinations, 3h.p., and 2½ h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [2078]

ENFIELD 8h.p. Combination, 1914, mechanically perfect, appearance like new, climbed Alms, Porlock, Beggars Roost, Lynton; £65.—Coates, 180, Gt. Portland St., London. [2014]

1915 6h.p. Enfield Coachbuilt Sidecar Combination, Lucas electric lighting set, speedometer, all in perfect condition, silent and powerful; cost £100 in May £70 cash.—R., 26, Caddington Rd., Cricklewood, N.W. [2176]

6 h.p. Enfield Combination, 1916 model, only done 1,000 miles, condition like new, Lucas lamps, exhaust whistle, a bargain, £72, or nearest, or exchange 1916 Norton big 4 combination.—Davies, Ecclestone, Staffs. [X4056]

ENFIELD 1916 6h.p. Combination, and accessories, £65; also 2½ h.p. 2-speed, and all accessories, £29/10; generous deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2039]

ENFIELD, the old-British combination.—We have them in stock, and are proud of it. £89/5 is the price, and it's the best thing at that figure, or any other for a matter of that. Exchanges quoted. If you prefer the Yankee article, see our advertisement under Excelsior (American).—Laytons' Garage, Bicester, Oxon. [X4154]

ROYAL Enfield New Combination, 6h.p. and 8h.p. chain-driven machines, fitted with handsome coachbuilt sidecar, countershaft gear and free engine, up-to-date thruout, complete with storm apron; 85 gns.; tuition free, and free delivery to any address within 50 miles of London; best terms for cash, exchange, or extended payments.—Wauchope's, 9, Shoe Lane, London. [X4259]

### Excelsior.

1915 American Excelsior, 7h.p., 3-speed, as new, only used 200 miles; £55.—Alexander's, 115, Lothian Rd., Edinburgh. [1934]

EXCELSIOR, 3h.p., B. and B., Bosch mag., a.i.v.; £10, or near offer, good order and condition; exchange cash for higher power.—Fearn, Burstead, Billericay, Essex. [2102]

EXCELSIOR (American).—Why pay £75 or more for a — when we offer you its genuine equal, that is American opinion at any rate, with 3-speed countershaft gear, at the special price of £60 now? He that hesitates is lost. Serve him right, too.—Laytons' Garage, Bicester, Oxon. [X4155]

### F.N.

F.N., 4-cyl., clutch, last; £17.—Sennitt, 33, Nicoll Rd., Willesden, N.W. [2019]

1914 2½ h.p. F.N., new condition; £18.—E. Chitt, 133, Sandhurst Rd., Catford. [2224]

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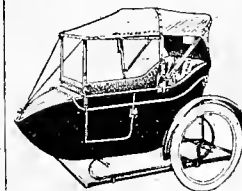
1916 2½ h.p. OMEGA-J.A.P., 2-speed ..... 38 gns.  
1916 2½ h.p. OMEGA, 2-stroke, 2-speed ..... 38 gns.  
1916 8 h.p. British EXCELSIOR Combination, Jardine 4-speed gear ..... £98 0  
1916 5-6 h.p. British EXCELSIOR, Sturmeys countershaft 3-speed gear ..... 68 gns.  
1916 4½ h.p. British EXCELSIOR, Sturmeys countershaft 3-speed gear ..... 64 gns.  
1916 NEW HUDSON 6 h.p. Combination .. 88 gns.  
1916 A.J.S. Combination, detachable wheels 98 gns.  
1916 8 h.p. ENFIELD Combination ..... 87 gns.  
1916 Sporting MORGAN, all on ..... £109 0  
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1916 FORD Chassis, 20 h.p. .... £115 0  
1916 FORD Van, 20 h.p. .... £130 0  
1916 20 h.p. FORD Ambulance ..... £135 0  
1916 6 h.p. ENFIELD Combination ..... 85 gns.  
1916 6 h.p. J.H. Combination ..... 90 gns.  
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2-speed RADCO, 2-stroke, fine condition ... £25 0  
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3½ h.p. 1908 TRIUMPH, fine goer ..... £17 0  
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8-10 h.p. Precision Engine, quite new. What offers? 6 h.p. Twin Antoine Engine, water-cooled... £6 0  
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F.R.S. Lamp Set, 1,000 beam, shop-soiled... 45/-  
New Clincher Clearance Covers, de Luxe, "heavy," rubber-studded, 26 x 2½, 26 x 2½, 26 x 2½, and 26 x 2½ x 2½ ..... each  
Latest Mechanical Horn, black and nickel... £1 0  
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Cowey Speedometer, for Morgan ..... £2 5  
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F.N., 4-cyl., 1913, 2 speeds, clutch, etc., overhauled; bargain, £25.—Earl, 5, Heath St., Hampstead. [X4278]  
 2½ h.p. F.N., fast and powerful, lamp and horn; £9/10, or offer.—Robins, 166, Wandsworth Bridge Rd., Fulham. [X4047]  
 F.N., 2½ h.p., countershaft 2-speed, clutch, Bosch; seen running; bargain, £14/10, offers.—Speckley, 45, Church Rd., Acton. [2196]

## Grandex.

GRANDEX-PRECISION, 1916, 2-stroke, 2½ h.p., quite new; listed £34, for £31; fine model.—Grandex, 86, Gray's Inn Rd., W.C. [21705]  
 2½ h.p. Grandex-Jap, 1914, recently overhauled, complete accessories, variable gear; £17 for quick sale.—Box L903, c/o The Motor Cycle. [2010]

## Harley-Davidson.

FOR Harley-Davidsons see below.

H-D. Canoelet Sidecar, 16 gns.—The Premier Motor Co. [2072]  
 H-D. Gloria Sidecars, 19 to 24 gns.—The Premier Motor Co., Birmingham. [2072]

THE Above Prices show you a considerable saving. Buy now. Offers cannot be repeated.—The Premier Motor Co., Aston Rd., Birmingham. [2072]  
 1916 Harley-Davidson; all models in stock.—Parker and Son, St. Ives, Hunts. [2146]  
 HARLEY-DAVIDSON, Model F, £68/5.—The Premier Motor Co., Birmingham. [2072]  
 MODEL J, with dynamo lighting outfit; £76/13.—The Premier Motor Co., Birmingham. [2072]

YOU Save £12 by purchasing direct from The Premier Motor Co., Aston Rd., Birmingham. [2070]  
 1914 Harley-Davidson, 7-h.p., only ridden 500 miles; £65, or near offer.—Herring, Blackmoor, Hunts. [2172]  
 SHROPSHIRE Agent for Harley-Davidsons; 1916 models, delivery from stock.—J. C. Pickering. [X3448]  
 HARLEY-DAVIDSON Models in stock, complete with Gloria sidecar.—Turpin, 22 and 29, Preston Rd., Brighton. [10713]  
 HARLEY-DAVIDSON, 1915 model 11F, special coachbuilt sidecar, full equipment, as new; cost over £100, accept £70.—Englemere, Laleham, Staines. [1937]  
 MODEL 11J Harley-Davidson, late 1915, Montgomery sidecar, Cape cart hood, numerous accessories, as new; cost £120, accept £80.—Simpson, Carbis Bay, Cornwall. [X3974]  
 HARLEY-DAVIDSON, 1915, J, and Empress sidecar, heap accessories; £65, bargain; generous easy terms; exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2040]  
 HARLEY-DAVIDSON, 1915½, model 11J, electrically equipped, with latest underslung sidecar, mileage about 5,000; accept £60; reason for sale, owner on active service.—After 7 p.m., 19, Wood Lane, Shepherd's Bush. [2032]  
 HARLEY-DAVIDSON, 1915, 7-9-h.p. combination, complete in every respect, Watford speedometer, Lucas accessories, machine run 337 miles, Harley-Davidson sidecar, brand new, delivered Feb. 18th, complete with luggage carrier, apron, etc.; cost £23; the whole combination as new; £85, no offers.—Walker, 14, Lauderdale Mansions, Maida Hill, W. [X3724]  
 FOR Best Terms and earliest delivery, place your order with the firm who introduced the Silent Grey in the Midlands. We offer the model F 7-9-h.p. Harley-Davidson 5-speed at £68/5, or the model J with dynamo electric lighting equipment £76/13; delivery same day that order is received. Carriage paid to any address. Tuition free if required. Get in touch with us now and save money.—The Premier Motor Co., Aston Rd., Birmingham. [2071]

## Henderson.

1914 Henderson, 8-10-h.p., wicker sidecar, just overhauled; trial run; £65.—Morrell, 14, Bevington Rd., Beckenham. [X4127]  
 1915 4-cyl. Henderson, brand new, with 20 gn. sidecar, shop-sold only; £82.—Alexander's, 272, Gt. Western Rd., Glasgow. [1935]  
 1915½ 4-cyl. Henderson, Millford sidecar, accessories, done 2,260 miles, perfect condition; £78/10; leaving England.—Parkin, 38, Gibbon Rd., Kingston-on-Thames. [2212]  
 HENDERSON, 4-cyl., 2-speed, new January, 1915, excellent order, run about 1,000 miles, ridden solo only; about £14 at accessories added; l.h. clutch, speedometer, etc.—Box 171, c/o The Motor Cycle. [X4061]

## Hobart.

HOBART, 1915, 2½ h.p., 2-stroke, 2-speed, lamp, horn, little used; £30.—17, Limes Av., North Finchley. [2096]  
 HOBART, 4-h.p. twin, Enfield 2-speed, Bramble sidecar, 1915; £55.—Garrard, 436, West Green Rd., Harringay. [2184]  
 HOBART, 1915 (August), 2-stroke, 2 speeds, 2½ h.p., like new; £28; owner going abroad.—Pitts, 12, Parade, Carmarthen. [1913]

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STANDARD  
OF SATISFACTION

IS TO BE FRIENDS WITH EACH INDIVIDUAL CUSTOMER AT THE END OF A SEASON'S RUN.

If we fail in this practical test, we are just as anxious as the customer to know the reason why, and to do anything and everything to give him complete satisfaction. Because—no question of gain is ever worth considering if it involves the loss of a customer's faith in the agent. This is the reason why Godfrey's have a name for straight dealing.

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Model G. 7 h.p. twin INDIAN, rigid frame, 3-sp. gear, kick starter ..... £75 0  
 Model F. 7 h.p. twin INDIAN, spring frame, 3-sp. gear, rear drive speedometer, Spliditor ignition lighting outfit, kick starter ..... £90 0  
 Model B. 5 h.p. twin INDIAN, 3-sp. gear, kick starter ..... £70 0  
 Model C. 7 h.p. twin INDIAN, 3-sp. gear, spring frame, electrically equipped, kick starter, and speedometer ..... £78 0  
 Model K. 4½ h.p. B.S.A., 3-sp. countershaft gear, chain-cum-belt drive, kick starter ..... £62 0  
 Model H. 4½ h.p. B.S.A., 3-sp. countershaft gear, chain drive, kick starter ..... £64 0  
 Model V. 2½ h.p. DOUGLAS, 3-sp. ..... £52 10  
 2½ h.p. DOUGLAS, 2-sp., W.D. Model ..... £54 12  
 Model D. 4½ h.p. ZENITH, clutch, Gradua gear, and kick starter ..... £73 18  
 Model A. 3½ h.p. ZENITH, standard, T.T. bars, Gradua gear ..... £62 7 6  
 ALLDAYS ALLOAN, 2-stroke, countershaft drive, and 2-sp. gear ..... £42 0  
 Model No. 180. 6 h.p. ROYAL ENFIELD Sidecar Combination, 2-sp., and handle starter ..... £89 5  
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 2½ h.p. CALTHORPE lady's, 2-stroke, Enfield 2-sp. ..... £35 14

## New 1915 Models in Stock.

SPECIAL END-OF-SEASON PRICES.  
ALL BRAND NEW MACHINES.

2½ h.p. CALTHORPE-J.A.P., 2-sp., fixed ignition ..... £34 0  
 2½ h.p. CALTHORPE-J.A.P., 2-sp., variable ignition ..... £35 0  
 2½ h.p. NEW IMPERIAL-J.A.P., light tourist, 2-sp., variable ignition ..... £35 0  
 2½ h.p. NEW IMPERIAL-J.A.P., light tourist, 2-sp., fixed ignition ..... £34 0  
 2½ h.p. NEW IMPERIAL-J.A.P., light tourist, single speed, variable ignition ..... £30 0  
 6 h.p. J.H., twin-cylinder, 3-sp. countershaft gear, M.A.G. engine, kick starter ..... £72 0

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10-h.p. CALTHORPE Minor Car, standard 2-seater ..... £194 5  
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 10-h.p. CALTHORPE Minor Car, Coupé ..... £231 0  
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 Model T. 5-seater FORD Car, complete with hood, screen, lamps, horn (delivery at works) ..... £135 0

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## MOTOR CYCLES FOR SALE.

## Hobart.

HOBART, 1916 models, just delivered, 2½ h.p., 2-speed, 2-stroke; 36 gns.; exchanges or extended terms quoted.—Elee and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0480]

## Humber.

2½ h.p. F.E. Humber, chain drive motor cycle; £3/10. —Vann, 81, Bolingbroke Rd., Coventry. [X4284]  
 HUBBER 2-h.p. Lightweight, accessories; bargain, £16.—Myham and Co., 197, London Rd., W. Croydon. [2129]

HUBBER, 1913, 2-h.p., just overhauled thoroughly, new tyre, accessories £15/10.—Hutchinson, Crowle, Doncaster. [X3776]

HUBBER, 3½ h.p., 2-speed, F.E., handle starting, like new; £18/10; must sell; trial.—46, Mary Rd., West Bromwich. [X4184]

HUBBER, 3½ h.p., and sidecar; £7/10; mag. ignition, running order; must sell immediately.—Speckley, 45, Church Rd., Acton. [2198]

HUBBER Twin, 2½ h.p., 1913, just been re-bushed, re-enamelled, etc., guaranteed first-class condition; £20.—Firth, 27, Woodbridge Rd., Moseley, Birmingham. [X3103]

HUBBER 2½ h.p. Twin, 1913 racing type, dropped handle-bar, all accessories, excellent condition, insurance policy transferred; £25.—Letters, Farr, 51, Albion St., King's Cross. [1970]

HUBBER, 3½ h.p., 2-speed, and side entrance sidecar, new belt and tyres, lamps, horn, spares, excellent condition throughout; £27.—Particulars, offers, 8, Lyceum Av., Blackpool. [X4257]

## Indian.

5 h.p. 3-speed Indian, and Bramble sidecar to match; £70.—Parker and Son, St. Ives, Hunts. [2147]

SHREWSBURY Agent for Indians; all models from stock, or early delivery.—J. C. Pickering. [X3449]

JULIAN'S, Broad St., Reading. Phone: 1024.—Immediate delivery of all Indian models. [X2836]

INDIAN Model C, 1916, new, twice out; owner called up; sold cheap.—Box 177, c/o The Motor Cycle. [X4193]

INDIAN, 1915, 7-9-h.p. T.T. model, nearly new, lamps, long horn; approval; £37.—Stoner, Aylsham, Norfolk. [2033]

INDIAN, 1915½, 7-9-h.p. T.T. ridden only 600 miles, fast, perfect; £42/10.—Killarney Villa, Collindale Av., Hendon, N.W. [X4124]

1914 Indian Road Racer, specially tuned, perfect condition, fully equipped, speedometer, etc.; £40.—Swano, 4, Fennel St., Manchester. [X4234]

1911 Indian (blue), 5-h.p. twin, overhauled, repainted, with Gloria cane sidecar, complete, with lamp, horn, etc.; £30.—Willways, Ltd., Bristol. [X4130]

INDIAN, 1915, as new, 5-h.p., 3-speed, clutch, kick starter, T.T. bars, with lamps, done 300 miles only; £55.—Walton's Garage, Workington. [1903]

INDIAN, 7-9-h.p., clutch model, new 1914, perfect, mileage 2,260, speedometer, lamps, owner on service; bargain, £37/10.—Byworth, Uxbridge. [2104]

1915½ Indian, 3½ h.p., 3-speed, clutch, kick start, condition as new, not done 1,000 miles; £46.—Private Austin, 4, Victoria Rd., Berkhamsted, Herts. [1956]

1915 T.T. Indian, 7-9-h.p., 2 head lamps and generator, Stewart mechanical horn, in splendid condition; £49.—S. E. Gardiner, Market Place, Frome. [X4149]

1916 7-9-h.p. Indian (Power Plus), 3-speed, semi T.T. bars, only ridden 180 miles, indistinguishable from new; £70, or nearest offer.—Motor Mart, Tottenham Rd., Eastbourne. [2154]

INDIAN 1915 Combination, almost new, £55; also a 1914 7-9-h.p., 2 speeds, and 220 sidecar, speedometer, hood and screen, new tyres, £45.—Percy and Co., 337, Easton Rd., London. [2235]

INDIAN 1915 7-9-h.p. Road Racer, with sporting underslung sidecar, electric head and tail lamps, horn, splendid order; £45.—Elee and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

INDIANS in stock for immediate delivery, models B, C, D, F, and G; also sidecars to suit from 10 gns.—P. J. Evans, sole Birmingham and Midland distributor, 87-91, John Bright St., Birmingham. [2080]

INDIAN, Sept., 1915, and 20 gn. coachbuilt sidecar, splendidly tuned, and in perfect condition, small mileage, very fast and reliable machine; cost £105, sacrifice 38 gns.; any trial.—Phone: Finchley 196. [X4060]

1914½ Indian Combination, 18 gn. Millford, 7-9-h.p., 2-speed, clutch, kick, electric equipment, new tyres, speedometer, used once a week, perfect; real bargain, £55; trial.—White, Fensdale, Bushey, Herts. [2122]

1915 5-h.p. Indian, 3-speed, kick starter, and clutch, engine and gears sound running order, enamel and plate well kept, F. and H. lamp, Lucas horn, Jones speedometer, tools, good tyres bargain, £42.—King, 20, Bridge St., Cambridge. [X4271]

INDIAN, model B, 5-h.p., £70; model F, powerplus, £90; model C, 7-9-h.p. powerplus, £75; also sidecars to suit; generous extended payments, liberal exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2051]

## MOTOR CYCLES FOR SALE.

## Indian.

INDIAN, 7.9-h.p., 1912, with underslung sporting sidecar, T.T. clutch, special carburettor fitted, spare chains, sprockets, etc., all first-class order; £31; trial by appointment.—Seen. Bowman, 2, Rutland Mews, Rutland Gate, Knightsbridge, S.W. [2092]

INDIANS, second-hand, overhauled, and guaranteed by P. J. Evans, John Bright St., Birmingham. 1915 7.9-h.p. 3-speed combination, £70; also 7.9-h.p. 2-speed sporting combination, with electric set, £48; 1911 5.9-h.p. clutch model, with coachbuilt sidecar, thoroughly sound, £32; all the foregoing are perfectly sound. [2075]

## Ivy.

31.1-h.p. Ivy-Precision 3-speed sidecar outfit, for sale, £22, property of mechanic, who has maintained same in excellent running order, sidecar is coachbuilt Watsonian folding, can be opened and locked in position in few seconds without any tools, speedometer, horn, mirror, 3 lamps; 2 generators, 2 new belts, etc., all tyres sound (one brand new), sprung carrier seats; £25; not a flash turnout, but neat, and a bargain for one who appreciates a machine in the best mechanical condition.—61, Lillieshall Rd., Clapham, S.W. [2219]

## Ixon.

IXION, standard model in stock, immediate.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1995]

## James.

JAMES, 2-stroke, in stock.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X4140]

SHREWSBURY Agent for James; early delivery all 1916 models.—J. C. Pickering. [X3450]

LATE 1914 4½-h.p. James with coachbuilt sidecar, run 100 miles, equals new, all accessories; £50.—R. E. Jones (Garages), Ltd., Swansea. [0784]

1913 James and Sidecar, complete, lamps, horn, numbers, etc.; £40, or exchange level for 1915 Douglas.—Cross, Edingham Sq., Rotherham. [X4231]

1913 4½-h.p. James and Canoelet sidecar, 3-speed, full accessories, splendid condition; £40, or near offer.—Douglas, 30, Christ Church Rd., Doncaster. [X4046]

JAMES 1915 3½-h.p. Twin, chain drive, kick start, all accessories, done 1,600 miles, everything as new; £50, or near offer.—Stoos, 543, London Rd., Westcliff-on-Sea, Essex. [1960]

JAMES, 1914 (new 1915), No. 6 model, as new, enamel and plate in new condition, Lucas lamps and horn, tradesman's carrier attached; £65.—Can be seen and tried at City Works, Chelmsford. [X4119]

JAMES, 1914½ 4½-h.p. twin, all engine bearings new, Bioks, Dunlop, extra heavy, and Palmer cord, Warford speedometer, Mec. horn, lamps, tools; nearest £45, or exchange 1914 Scott Combination.—Beaumont, Tipton, Devon. [X4133]

JAMES, 2½-h.p., 2-stroke, late 1914, horn, lamps, generator, speedometer, minus cable, new Dunlop on back, good condition, perfect running order, property of officer gone overseas; £25.—Captain Nicholson, Markyate, Dunstable. [X4176]

SEEN Birmingham District.—1915 3½-h.p. twin James, just overhauled and finished all black, 3-speed countershaft gear, all enclosed chain drive, 4 tyres and tubes, other accessories; cost £75, what cash offers.—Box L893, c/o The Motor Cycle. [1953]

JAMES 1915 Combination, practically new, done 500 miles, 4½-h.p., 3-speed, countershaft gear, clutch and kick starter, coach sidecar, head lamp, generator, Lucas horn, rear light, etc., guaranteed sound; £67/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

## J.A.P.

1914 J.A.P. 6-h.p. Combination, 2-speed; £38.—E. Chitty, 133, Sandhurst Rd., Catford. [2223]

J.A.P. Combination, 3-speed, kick start, coach sidecar; £38.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1994]

J.A.P. 3½-h.p. 1915 Engine, Simms, Senspray, in Chater frame, tyres, tubes good; £10, or near offer.—235, Minard Rd., Catford. [2186]

41-h.p. T.T. J.A.P., 1915 engine, single, overhead 2 valves, single gear, very fast machine, horn, etc.; £23.—Apply, Santa, Combe Florey Rectory, near Taunton. [1909]

1914 J.A.P. 6-h.p. Combination, 2-speed, chain drive, engine entirely overhauled and re-hushed, the enamelled throughout, sidecar coach painted grey, the whole turnout as new; £55.—Willways, Ltd., Bristol. [X4131]

## Juno.

JUNO, new 2½-h.p. Villiers 2-stroke, semi-automatic lubrication, and all latest improvements; £29/10, 4/8 month.—See below.

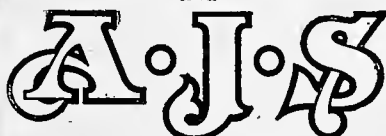
JUNO-V.T.S., 2½-h.p., 2-stroke, second-hand, very little used, late model; price £22.—See below.

JUNO-J.A.P., 6-h.p., Sturmer-Archer countershaft gear, semi-automatic lubrication, heavy 2½-in. Dunlops, Druid forks, aluminium footboards, and all latest improvements, brand new; price £75/12. Catalogue for full particulars. All ready for immediate delivery.—Seen at Metropolitan Machineists' Co., Ltd., Showrooms, 248, Bishopsgate, London. [2165]

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## NEW MODELS.

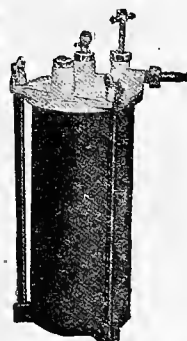
8-h.p. Sporting MORGAN, upholstered back	£97 8
6 h.p. A.J.S. Combination .....	£102 18
4 h.p. A.J.S. Combination .....	£93 17
4 h.p. A.J.S. Solo .....	£76 0
2½-h.p. A.J.S., 3-speed .....	£58 0
2½-h.p. 2-str. EXCELSIOR, 2-sp., and clutch	£44 2
Coach-built Sidecar for same .....	£10 10
8 h.p. British EXCELSIOR, 3-speed .....	£78 15
2½-h.p. ALLONS, 2-speed .....	£42 0
6 h.p. ENFIELD Combination .....	£89 5
2½-h.p. CALTHORPE-J.A.P., 2-speed .....	£37 16
4½-h.p. CALTHORPE, 2-stroke, 2-speed ..	£32 11

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## Low Generators.



Economy and a brilliant  
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light can always be  
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Flame reduced at will.  
Lights immediately by  
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Price:

Motor Cycle size **35/-**  
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'Phone—Museum, 1240.

Telegrams—"Dynametro, Westcent, London."

## MOTOR CYCLES FOR SALE.

## J.H.

J.H. Motor Cycles, latest models, in stock.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1988]

J.H., new, 6-h.p. M.A.G., Canoelet, 3-speed countershaft, kick starter, heavy Dunlops, electric lamps, sacrifice £2; lightweight part.—Slaith, 42, Kirkstall Rd., Streatham, S.W. [2133]

## King Dick.

31-h.p. King Dick, 1913-15, clutch, perfect, 2,000 3/2 mile only; owner retired; nearest £25.—Odell, 2, Portland St., King's Lynn. [X4275]

## Lea-Francis.

LEA-FRANCIS, 3½-h.p., 1915 model, 3-speed gear, kick starter, electric lighting set, horn, speedometer, in perfect running condition, done approximately 3,000 miles; first cheque £54/10.—Apply, Alexander and Co., 272, Gt. Western Rd., Glasgow. [1936]

## Levis.

1915 Levis Popular, good as new; £25.—Parker and Son, St. Ives, Hunts. [2149]

JULIAN'S, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all Levis models. [X2837]

LEVIS Baby Model, 1914; bargain, £17/10.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1998]

LEVIS Popular, or new model E; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0764]

LEVIS, 1915, new Dunlops and belt, P. and H. set, 1 tools; £18/10 cash.—4, Rischelmo St., Victoria Park, E. [1899]

1915 Levis Popular, choice of two; £21 each; perfect condition, mileage about 1,000.—Ricks, Kington, Woking. [2023]

1916 Popular and Model E Levises, delivery from stock; cash or easy terms.—Wilkin and Co., Hunter's Bar, Sheffield. [2188]

LEVIS 1914 Model de Luxe, 2-speed, excellent running order, all accessories; £26.—M. O. Corder, The Brewery, Romford, Essex. [X3566]

1915 Levis Popular, with footboards, absolutely indistinguishable from new; 25 gns.—Julian, Broad St., Reading. 'Phone: 1024. [X3023]

LEVIS, 1914, 2½-h.p., footboards, sight feed lubrication, mag. control, fully equipped; offers over £21.—Box L381, c/o The Motor Cycle. [8497]

LEVIS Popular, 1915, semi-T.T. bars, fine condition throughout, fully equipped; first cheque £20 secures.—Box L790, c/o The Motor Cycle. [1583]

1915 Levis Popular, excellent condition, little used, Millers lamp set; £23.—Sergeant Fulcher, C., Company, 3rd Norfolk Regt., Felixstowe. [1943]

1916 2½-h.p. Levis, as new, only done 300 miles, lamps and horn; £28/10, exceptional bargain.—W. Buck, 12, Town Mead Rd., Waltham Abbey, Essex. [2009]

LEVIS Popular, 1913, splendid condition, Bosch variable mag., Amac carburettor, all accessories included; only £17/10.—Norfolk Villa, Joseph's Rd., Guildford. [2113]

LEVIS 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. 'Phone: 1432 Regent. [0711]

LEVIS, 2½-h.p., 1915, ridden 1,173 miles, absolutely as new, unscored; bargain, £22/10; or with speedometer, 2 lamps, large horn, etc., £26.—Walton Motor Co., Ely, Cambs. [X3970]

LEVIS, 1915, 2½-h.p. Model de Luxe, 2-speed, countershaft, lamp, horn, etc., in splendid order; £34.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [1915]

PERFECTLY New 2½-h.p. Levis Model de Luxe, 2-speed gear; cost £52/10 seven days ago, only ridden from agents; owner called up; no accessories; £46/10.—Ross, 195, Alton St., Crewe. [1941]

LEVIS Popular, 1916 models. We can deliver promptly at £32 cash, or by deferred payments; we have also in stock the standard Popular model at £28/1.—Oxfordshire Agents, Laytons' Garage, Bicester, Oxon. [X4166]

LEVIS 1916 Popular Models, £32; No. 1's, with Enfield gear, Roman rims, £47/10; also one No. 1 model, 1915, and Popular at old price, liberal deferred terms, generous exchanges.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2049]

## L.M.C.

1913 3½-h.p. L.M.C., variable gear; a good deal, £27; guaranteed, easy payments arranged.—Jones, Garage, Muswell Hill, N. [2242]

## Lugton.

LUXTON, 1914, Bosch waterproof, Druids, N.S.U. 2-speed; £20.—39, Belmont Park Rd., Leyton. [2207]

## Martin.

MARTIN-J.A.P., 1914, T.T., 8-10-h.p., J.A.P. engine, overhead valves, 2-speed countershaft gear and clutch, splendid order; £45.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0552]

## MOTOR CYCLES FOR SALE.

## Martin.

MARTIN-J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear £37/10.—Sole London and District Agents Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Ave., W.C. Tel.; Regent 1432. [0760]

## Matchless

MATCHLESS Combination, 1914, 3½ h.p. twin, 3 speeds, kick starter; £40 to clear.—Percy and Co., 337, Euston Rd., London. [2232]

1913½, 3½ h.p. Matchless T.T. Twin, overhead valves, 3-speed, kick start, in fine order; £31, no offers.—J. W. Fortnum, Middlewich. [1907]

1913 7½ h.p. Matchless, Canoelet sidecar, all accessories; £55, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [0721]

1915 Matchless 8B. Combination, perfect condition, speedometer, lamps, horn, spares; accept £78, or near offer.—Dymond, 1, Windsor Terrace, Newcastle-on-Tyne. [X4086]

8 h.p. Matchless, model B, J.A.P. engine, horn, lamps, Cowey speedometer, all spares, perfect condition, just overhauled by makers, with sidecar; £45, or separately; cost £407.—1, De Freville Av., Cambridge. [X4185]

1914 (May) Matchless 8B. Combination, Lucas set, Cowey speedometer, entirely overhauled, re-enamelled throughout as new, not used nearly 12 months; owner active service; accept £73.—Willways, Ltd., Bristol. [X4129]

MATCHLESS, 8 h.p., countershaft, all-chain drive, 17 gn. sidecar, F.R.S. 78/6 lamp set, sidecar lamp, electric rear light, done 5,000, perfect; ride 100 miles; 56 gas.—Troward, Heathurst, The Vale, Hampshire. [1893]

1914 Matchless, M.A.G. engine, 3-speed countershaft gear, chain drive, complete with Matchless handsome coachbuilt sidecar, which includes hood and screen, and all accessories; £75; guaranteed.—Wanchope's, 9, Shoe Lane, London. [X4241]

## Minerva.

3½ h.p. Minerva, red, T.T. bars, U.H. mag., in excellent condition; bargain, £20.—75, Crayford Rd., Taffel Park, N. [2036]

2½ h.p. Minerva, modernised, 1914 U.H. mag., 1912 B. and B. ride 50 miles to purchaser; photo; £9.—12, Asylum Rd., Peckham, London. [2214]

## Moto-Reve.

MOTO-REVE Twin Lightweight, mag., Droids, smart machine; bargain, £8/10.—Speechley, 45, Church Rd., Acton. [2197]

## Motosacoche.

1915 3½ h.p. Twin Motosacoche, 2-speed, air-cooled exhaust valves, with coachbuilt sidecar, brand new, shop-soiled only; £56.—Alexander's, 115, Lothian Rd., Edinburgh. [1935]

## New Hudson.

NEW Hudson, 1915, 2-stroke, as new, all accessories; £27.—Mydam and Co., 197, London Rd., W. Croydon. [2128]

NEW Hudson, 1916, model C, 2-stroke, £38; immediate delivery from stock; liberal exchange terms.—Below.

NEW Hudson, 1916, 6 h.p., passenger combination; £92/8; just arrived from works; liberal exchanges.—D. J. Shepherd and Co., Enfield Highway, London, N. [1939]

NEW Hudson, 1915, 2½ h.p., 2-stroke, £40 model, spares, 2 tyres (1 new), tube, belt, etc.; £29; owner enlisted.—Reid, Leadhills. [X4211]

NEW Hudson, 1915, 2½ h.p., 2-stroke, magnificent condition; 20 gns.; cheapest New Hudson in England to-day.—Julian, Broad St., Reading. Phone: 1024. [X3024]

NEW Hudson, all 1916 models in stock, also 1912 3½ h.p. 3-speed coach combination; 33 gns.; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2042]

NEW Hudson, 1914, 6 h.p., with 1915 improvements, 3-speed, clutch, Millford coachbuilt tandem sidecar, will take 2 adults, Miller's lamp set, and speedometer, not done 3,000 miles, cost £100, very smart outfit; a genuine bargain at £65.—367, Ivydale Rd., Nnhead. [2021]

## New Imperial.

NEW Imperial-Jap, 1916 models in stock, from £36/15.—Crow Bros., Guildford. [1878]

JULIAN'S, Broad St., Reading. Phone: 1024.—Immediate delivery of all New Imperial models. [X2838]

NEW Imperial, light tourist, immediate delivery; cash or easy terms.—Referee Cycle Co., 332, High Holborn. [0765]

NEW Imperial, 2½ h.p. J.A.P., 2-speed countershaft gear, nearly new, lamp, generator, horn; price £26.—Seen at 248, Bishopsgate, London. [2166]

1913 New Imperial, 2½ h.p., 2 speeds, very little used; owner enlisted; any trial; cheap, £27.—James, Bread and Cheese Hill, Thundersley, Essex. [1897]

NEW Imperials, 1916 models, in stock; sole London agents; trade supplied; few 1916 shop-soiled at reduced prices.—A. P. Key, 173, Gt. Portland St., London, W. [7832]

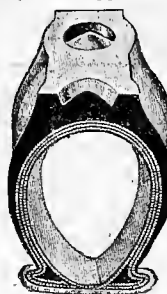
## The Motor Accessory Clearing House.

We buy or exchange as well as sell modern accessories and parts of all kinds. Send us what you want to get rid of and state your lowest price.

Special Clearance of new and unsoiled

**KEMPSHALL TYRES.**

(Trade supplied.)



HEAVY NON-SKID—		Our Price.	Usual Price.
26 × 2½	.. ..	27/-	42/-
26 × 2½	.. ..	29/6	43/-
26 × 2½ × 2½	.. ..	29/6	47/6
28 × 3	.. ..	39/6	70/-
HEAVY ANTI-SKID—			
26 × 2½	.. ..	24/-	32/6
26 × 2½	.. ..	25/-	37/6
26 × 2½	.. ..	27/-	38/6
28 × 2½	.. ..	28/-	42/-
28 × 3	.. ..	29/6	57/6

THE ABOVE ARE THE LOWEST PRICES AT WHICH THESE TYRES HAVE EVER BEEN OFFERED.

## SERVICE BELTING.

Doesn't slip, and lasts three times as long as rubber.

The strongest for Sidecar Combinations. The most flexible for lightweights.

TRY IT.



Price per foot—		1 in.	1½ in.	2 in.	2½ in.	3 in.
1/9	2/-	2/3	2/6	2/9	3/-	
Special Line, Spliced—		1/4	1/6	1/8	1/11	2/1
Used—		11d.	1/-	1/1	1/3	1/4
						1/6

JOB LINES IN OTHER BELTS, NEW AND SECOND-HAND :: STATE REQUIREMENTS.

*The Service Company Ltd.*  
(LONDON)

289-293, High Holborn, LONDON, W.C.

## MOTOR CYCLES FOR SALE.

## New Imperial.

NEW Imperial, 1915, September, 2½ h.p., 2-speed, overhead inlet, T.T. does over 50; £30, or exchange; combination.—Clarke, Papco, St. Mary's Rd., Surbiton. [1944]

2½ h.p. New Imperial-Japs, latest models, just delivered, 2-speed and free engine, an ideal light-weight; £36/15; cash, extended payments, or exchange.—Wanchope's, 9, Shoe Lane, London. [X4240]

1915 New Imperial-Jap, 2-speed, variable ignition, new horn, 26 gns., very great bargain; 1915 New Imperial, No. 2 model, with 2-speed gear, clutch and kick starter, 26 gns.—Julian, Broad St., Reading. Phone: 1024. [X3025]

## New Ryder.

NEW Ryder, J.A.P. 2½ h.p., 2-speed, 1915½, new condition; offers.—"Grocers' Gazette," 71, Eastcheap, E.C. [1954]

## Norton.

1916 3-speed Countershaft Norton, 62 gns.; also several 1914 Nortons in stock, £45.—Parker and Son, St. Ives, Hunts. [2148]

1913 3½ h.p. 3-speed Norton, in excellent running order; £29; easy payments arranged.—Jones, Garage, Muswell Hill, N. [2243]

NORTON, 1914, 3½ h.p., T.T. model, in splendid mechanical order, very fast and reliable; £37/10.—Elce and Co., 15-16, Bishopsgate Av., Cannon St., E.C. [0479]

1916 3½ h.p. T.T. Norton, Philipson pulley, Big Four combination, chain drive, and the new sporting model all-chain drive; delivery from stock.—Wilkin, Hunter's Bar, Sheffield. [2189]

NORTON, 1915, 4½ h.p., 3-speed countershaft, kick starter, speedometer, run 900 miles only, with sporting £15 sidecar; £55, or offer.—Percy and Co., 337, Euston Rd., London. [2234]

## N.S.U.

N.S.U., 3½ h.p., mag., Whittle belt, good tyres; £5/10.—1, Melrose Rd., Merton Park. [1931]

## O.K.

1916 O.K. Junior, in stock; £27/10.—Cross, Agent, Rotherham. [X4230]

O.K. ladies', 1916 model, open frame, 2-speed, handlebar controlled clutch, brand new, in stock; £42/15. Tel.: 388. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [6867]

## Omega.

OMEGA, 3 h.p., Oct., 1915, 2-stroke, 2 speeds, speedometer, lamps, horn, etc.; £30, near offer.—3, Carson Rd., W. Dulwich. [2055]

## P. and M.

P. and M., 3 h.p., 2-speed, free; £13.—51, Elliott Rd., Chiswick. [2022]

P. and M., 1911, speeds; £25, bargain; exchange 2-seater.—8, Mayfield Place, Eastbourne. [2125]

P. and M., 1913, perfect, in new condition; £35, bargain.—39, Belmont Park Rd., Leyton. [2206]

1915 P. and M., 3½ h.p., 2-speed, looks new, hardly used; £63/10.—McKenzie, 24, Bargoed Terrace, Trebaris. [2228]

P. and M., 1910, in good order, will take sidecar, never been used during last 18 months, complete with all accessories; a bargain, £24.—Embro Cycle and Motor Co., Charlotte St., Hull. [2221]

P. and M. 6 h.p. Twin, 1915, complete with luxurious Gloria sidecar, Lucas lamps, speedometer, and every necessary requisite, equal to new in condition and appearance, and without a doubt the best turnout at the present time, an exceptional opportunity; accept spot cash (no offers) £97.—Embro Cycle and Motor Co., Charlotte St., Hull. [2220]

## Peugeot.

1913 7-9 h.p. Peugeot, Bosch 2-speed, kick start, Droids; bargain, £20.—39, Belmont Park Rd., Leyton. [2204]

## Pope.

POPE Twin, 12 h.p., torpedo, 2-seater, excellent order; examination; make good light boy; £25.—Hartley, Kegworth. [X4235]

POPE, the big twin, 1916 models.—Immediate delivery from Dougal and Co., 10, Merchant St., Bristol, sole district agents. [X3622]

## Precision.

PRECISION, 4 h.p., and sidecar, 3-speed, clutch, lamp, ready ride away; 24 gns.—Davies, 52, Gauden Rd., Clapham. [2015]

1914½ 3½ h.p. Precision, Bosch, B. and B. new tyres, tubes, belt, and valves, engine re-hushed, perfect condition; £22/10.—52, Huxley Rd., Edmonton. [1982]

## Premier.

PREMIER, 2½ h.p., fine machine; £17.—Garage, Larkhill Camp. [1979]

3½ h.p. Premier, perfect, new tyre, Binks, overhauled; £218.—82, York Rd., Battersea. [2215]

2½ h.p. 1914 Premier Lightweight, just been overhauled, perfect condition, complete with lamps and horn; £18/10, offers.—Cyril Taylor, Court Royal, Tunbridge Wells. [1973]

MARCH 16TH, 1916.

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

**Advertising and Publishing Offices:**  
20, Tudor Street, London, E.C.

Telegrams: "Cyclist, Fleet, London."  
Telephone: 2848 City (five lines).

**Editorial Offices:**  
Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
Telephone: 10 Coventry (five lines).

**Northern Offices:**  
199, Deansgate, Manchester.

Telegrams: "Hiffe, Manchester."  
Telephone: 630 City.

**Subscription Rates:** Home, 6s. 6d.; all countries abroad, 10s. 10d. per annum.

## COLONIAL AND FOREIGN AGENTS

UNITED STATES—The International News Agency, New York.

News Co., Winnipeg; British Columbia News Co., Vancouver; Gordon & Gotch, Ltd., 132, Bay Street, Toronto.

AUSTRALIA—Gordon & Gotch, Ltd., Melbourne (Victoria), Sydney (N.S.W.), Brisbane (Queensland), Adelaide (S.A.), Perth (W.A.), and Launceston (Tasmania).

NEW ZEALAND—Gordon & Gotch, Ltd., Wellington, Auckland, Christchurch, and Dunedin.

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## Aluminium Pistons for Two-strokes.

**I**N this issue we publish an article detailing the result of a prolonged test of a two-stroke engine, particularly in regard to the formation of carbon. It will be observed from the experiences related that after a period of running extending to practically a thousand miles the two top rings suffered in the same way as in most engines of the two-stroke air-cooled type; that is, the rings became so firmly embedded in their grooves that ordinary means of removal became impossible, and the rings were broken. This result, it must be confessed, is not a particularly creditable one, and it once again brings up the question of the desirability of the use of pistons composed of a better heat conducting material than cast iron. Aluminium alloy, as we have already pointed out in recent articles in these columns, offers certain peculiar advantages for motor-cycle use, the chief of which is that an aluminium alloy piston may be made considerably thicker than a piston of the orthodox kind while weighing no more, yet by reason of its thickness it is able to keep its temperature comparatively low by dissipating the heat through its own bulk and also communicating it to the cylinder walls. Aluminium is also a far better conductor of heat than cast iron. The rapid burning of oil in the piston grooves and on the piston head, as experienced with miniature two-stroke engines, which as a regular part of their life are working nearly up to the limit, points directly to excessive heating of the piston. It is a well-known fact that carbon deposits do not form nearly so quickly in the case of a cool running engine as on an engine susceptible to overheating. Promising as the aluminium piston is on paper so far as the four-stroke engine is concerned, it offers fourfold possibilities in connection with two-strokes, which engines are still suffering from certain defects unknown to their four-stroke prototypes. Something must be done, and that quickly, to counteract these troubles.

## Looking Ahead.

**W**AR requirements in the matter of munitions have been the means of increasing two-fold and often four-fold the equipment of machine tools in different engineering works. The motor trade section, which is contributing its full quota of munitions, is at the present time abundantly stocked with lathes and machine tools of the latest labour-saving patterns, and in trade circles the interesting query frequently crops up, "What will become of these machine tools after the war?" Quantity production, when the car and motor cycle industry begins to resume its normal state, is a foregone conclusion, and many wise heads already foresee in the modernising of factories regardless of expense indications of keen competition ahead. Probably in the future there will be no such thing as firms producing several different patterns of machines; instead, each firm may standardise a single model and produce that design in quantities on the cheapest possible lines consistent with British quality—which is proverbial—and so bring about a probable decrease in selling price. These are the indications, though one may only conjecture at present; but the moral is that it behoves those manufacturers who at present are apparently oblivious to the motor trade in the rush for munitions to depute a portion of their engineering staff to keep *au fait* with changes in design, and to develop improvements which may not only be useful in the present war, but will also be instrumental in regaining for the British motor cycle trade its leading place in the world. An eye to the future at the present time and a careful formulation of post-war plans may mean the saving of many disappointments and much confusion when the time arrives for manufacturers to return to their legitimate business. Quantity production means a multiplication of markets for the disposal of goods, and overseas trade channels cannot be created in a day.



## A TWO-STROKE AFTER 1,000 MILES.

The Rapid Formation of Carbon and its Effect upon Piston and Rings. The Possibilities of the Aluminium Alloy Piston.

**R**ECENTLY we had occasion to remove, for the first time, the cylinder of a  $2\frac{1}{4}$  h.p. lightweight two-stroke which has rendered yeoman service to different members of our staff during the autumn and winter. During that period the machine has probably covered upwards of a thousand miles without attention of any kind, and, like most machines handled by a number of riders, receives more harsh treatment than one used by a single man (especially when that rider is the owner) who takes the greatest care and interest in his mount.

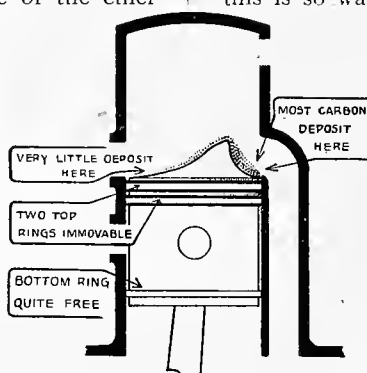
As all owners of the two-stroke type of motor must know, the difficulty of keeping the piston and ring grooves free from carbon deposit is one of the chief drawbacks to these otherwise wonderfully handy little machines, in most instances cleaning being required every 300 or 400 miles. We intentionally left the engine alone, being interested to see its condition after more than double that distance of very hard driving. The time came when knocking occurred after long non-stop runs, and on lifting the cylinder—quite a simple operation—the small amount of carbonaceous deposits on the piston top was most noticeable. The deposit had collected chiefly in the recess which forms the cylinder entrance to the transfer passage, but even here it was not thickly covered, and what there was was of a distinctly soft nature.

### The State of the Rings and Grooves.

The next thing to be observed was the piston, and we were much surprised at the apparent absence of top piston rings, but on close examination it was seen that the two top rings were so tightly gummed in with carbon deposit that there was little semblance of a join. It was, therefore, very evident that this gumming of the piston rings was the cause of the falling off in power during the last few hundred miles, and on occasions it had been found impossible to cover more than a few miles at any speed approaching full throttle without stopping, owing to the machine apparently overheating and preigniting. The next thing was how to remove the rings without breaking them, but after much patience had been exercised it was found to be impossible; even the process of removing the rings in pieces was none too easy, so firmly set were they. It was eventually accomplished with the aid of an old file, with the tang sharpened, and a light hammer. *Moral: Don't put off the day of cleaning too long if the rings are to be preserved.* New rings were afterwards fitted, and the improvement in the power output was immediately noticeable; the running continued to improve until about 200 miles had been covered, when the symptoms of preignition and pulling up were again slightly noticed.

The actual cause of this piston ring trouble on two-strokes is a point on which there has been much

discussion, and upon which little has so far been found out. That excessive heat, owing to the increased number of explosions, is the cause there is no doubt whatever, but how to prevent it—that is the question? A very likely cause of the trouble is that, upon the hot exhaust gas rushing out of the opening exhaust port, a backward eddy is set up, and before the piston rings have been completely covered by the cylinder beneath the port, the hot gases impinging on them cause the oil within the groove gradually to carbonise, rapidly causing the ring to become set. Apparently the only positive cure known at present for this trouble is water-cooling. That this is so was proved to us when, after removing the cylinder of the baby two-stroke, we also removed those of a water-cooled two-stroke Scott belonging to a member of our staff and which had covered roughly the same distance as the "baby," and found that the rings were perfectly clean and free, but that there was rather more deposit on the piston tops. The Clyno Engineering Co. have gone far to overcome the difficulty by making grooves which would collect oil, and so render the piston more or less compression tight at the top. The rings being situated at the bottom, are never exposed to the hot gas, and this method is more or less successful, though it is found that



Piston of a two-stroke engine after 1,000 miles running, showing where carbon deposit had collected.

the grooves themselves soon become full of carbon deposit, and cause to a certain extent the same trouble as the rings. It is common knowledge that inferior oil will cause this carbonisation to occur more rapidly, and for this reason greater care should be used in the selection of oil than would be the case with a four-stroke.

That there is an outstanding need for great improvement in the two-stroke piston is very obvious, as to take his cylinder off for cleaning purposes oftener than once a season is more than can reasonably be expected of the ordinary amateur, and with the present system it is apparently necessary, in order to obtain anything like the best results, to remove the cylinder about every 300 miles, which is absurd. Fortunately the task is a simple one, but compare this distance with 5,000 to 6,000 miles of the average water-cooled car engine. It will be remembered that in an article which appeared in *The Motor Cycle* of December 2nd, 1915, on aluminium alloy pistons, it was stated that, owing to the excellent heat conducting properties of aluminium, the presence of carbon deposit was almost imperceptible. It would, therefore, seem that these pistons may open up a simple and positive cure for this persistent and almost only trouble of an otherwise excellent type of engine, as, by the more rapid conduction of the offending heat, the oil, whether of good or inferior quality, will be less readily burned and carbonised.

# Occasional Comments by "Ixion"



## A Good Combination.

Keen as I have always been on the infinitely variable gear, I had omitted until last week to test one of the most modern innovations in that line, consisting of a three-speed gear in conjunction with a Philipson variable pulley. It need hardly be said that the outfit is truly delightful. You have no anxiety about belt slip; you know your emergency ratio is low enough for the ascent of Snowdon; you cease to be chained down to two or three arbitrarily selected ratios, none of which quite fits the grade you are tackling, and the lesser gradations of ratio are practically automatic, so that you are not eternally shifting a lever. I do not approve in theory of using two attachments where one will do, but the Philipson pulley is apparently as reliable and trouble-proof as an ordinary solid pulley. The Philipson device has not yet been applied very extensively to countershaft pulleys, though Mr. Philipson regularly uses such a pulley on his two-speed Douglas. But if—or when—it is, it will add a further refinement to our most modern machines.

## Other Makers Please Copy.

I always time delivery of my new machines, when possible, for a date at which I have plenty of leisure. I know that I shall have to procure a registration number; paint or "transfer" it on to the plates, which means taking the plates off, and replacing them; fitting a speedometer—say three hours, if one does not have to write to the speedometer maker for a fresh bracket which will really fit; fitting a lamp—say an hour, etc., etc. So that—with ordinary luck—one may take the road on the third day after delivery. Judge of my amazement when the newest machine arrived already numbered, already be-lamped both fore and aft, and—miracles have not ceased—already speedometered! I was doing 50 m.p.h. within an hour of signing the railway receipt. No, gentlemen! No, no, no! Wild horses will not drag from me the name of the laudable firm, at any rate till the war is over; they are up to their necks in munition work, and the rush of orders which this small publicity would ensure, would bring down their grey hairs with sorrow to the grave. But when the war is over, you shall hear the name; and the rest of our sleepy, stupid old trade will soon file their petitions.

## Aluminium Pistons.

On December 2nd last we published an article on aluminium pistons which was considerably more authoritative than we were permitted to disclose. Suffice it to say, that there are far more aluminium pistons in Government service than most people imagine, and that this type of piston promises to become very common on high-powered engines when the war is over. I sincerely hope that motor cycle manufacturers are not going to lag behind, because there is already ample evidence that the new piston will be even more valuable on air-cooled motor cycle engines than on big car and airship units. Contrary to general

supposition, it is not a "revving fake." I owned a small engine last year to which light aluminium pistons had been fitted in the interest of r.p.m., and whilst they gave me an extra 5 m.p.h. or so, they caused me some trouble with broken rings—at any rate I blamed them for the trouble so experienced. But when our technical experts got to work with aluminium pistons, they soon satisfied themselves that their real value was only experienced if the aluminium casting was made so heavy that no saving in weight was effected.

## Their Two Merits.

This surprising conclusion is based on two facts. One is that you cannot seize up a properly designed and constructed aluminium piston; you can work an engine so fitted at top r.p.m. for a far longer period than a cast-iron piston will stand. The other is that carbonisation is considerably retarded. Both merits are obviously due to improved cooling. Now seizure and carbonisation are the two worst defects of the modern motor cycle engine. Seizure, perhaps, only falls to the lot of "blindlers," so far as four-stroke engines are concerned, though the potterer not infrequently experiences it on two-stroke engines. But carbonisation is the common lot of all motor cyclists. Even if it were true, as some of our correspondents allege, that any sensible rider can get 4,000-6,000 miles out of a decent engine between decarbonisations (and such statements are gross exaggerations), it would be worth incorporating an improvement which extended the intervals to 6,000 and 8,000 miles respectively; *a fortiori*, the same argument is even more forcible in respect of two-strokes, for their rapid carbonisation is the worst blot on their good name. Therefore, the motor cycle manufacturer who makes himself thoroughly *au fait* with aluminium pistons before the war is over is the man who is going to get the trade; and all manufacturers who delay experiments and leave the new pistons to car designers and aviation engineers are—well, if I said what I thought about them, our emergency lady staff would strike; so I leave it to your imagination, dear reader.

## Preparing the Belt for a Tour.

I saw a member of the leviathan sidecar brigade getting his belt (yes, belts still linger, you know) ready for a tour. He gripped it in a vice and made two holes an inch apart through each end in less time than it takes me to describe it. To protect myself from an avalanche of letters asking for the make of punch which bites through  $1\frac{1}{8}$  in. rubber belting like an electric drill, I had better add that he used a ratchet brace. Two of the holes were occupied by the fastener bolts; the two surviving holes were filled up with spare bolts ready for what he quaintly called "der Tag"; he knew the northern hills would damage his belt joint before he got home, and what handier method could be devised of keeping spare bolts ready, whilst the filled holes avoided belt weakening.

# A MOTOR CYCLIST ON THE MÖWE.

## Adventures of a Sydney Rider on his way to England

**A** PATRIOTIC Australian motor cyclist, Mr. Arthur du Bois , set out from Sydney on November 13th last year for England with the object of enlisting in the M.M.G.S. We knew he had sailed with this intention, as he had acquainted us of the fact, but naturally we were surprised when, after a reasonable lapse of time, no news was heard of him. The reason was not far to seek, as recently he turned up and told us that his ship had been the gallant *Clan McTavish*.

Mr. du Bois , though of French descent, looks every inch a Briton. He is a motor cyclist of some ten years' experience, and has been the owner of many machines. He began his motor cycling career with three Saroleas, which were formerly known over here as the Kerry, then he had a four-cylinder F.N., which was followed by two Kerry-Abingdons; next came a twin Matchless fitted with the six-speed expanding pulley gear, and finally a 7-9 h.p. Harley-Davidson. About the two latter Mr. du Bois  was most enthusiastic. He has not done much competition riding, but about eighteen months ago he took part in a 400 miles twenty-four hour event organised by the Kookooburra M.C.C., and much enjoyed it. Kookooburra in the aborigine tongue means a laughing jackass. Asked about the price of petrol in Australia, Mr. du Bois  told us that, though the fuel costs no more on the coast than it does in England, it costs 2s. 6d. per gallon up-country in peace time, and he was amused to hear that we in England were grumbling at this sum in time of war.

### Early Tastes of War.

The voyage of the *Clan McTavish*, on which, as already stated, Mr. du Bois  sailed, was uneventful till she reached Dakar, when a small six-pounder gun was picked up as a defence against hostile submarines. Thereafter, nothing happened till they reached a point at 6.15 p.m. one day about 150 miles north of Teneriffe, when an innocent looking ship sailed across the stern of the *Clan McTavish* and signalled, "What ship are you?" The Britisher was, however, cautious, and replied with the same question. To which the unknown one answered, "*The Author, Liverpool*," giving the name of a ship she had sunk some days before. So she drew near, and suddenly signalled, "Stop! I am a German cruiser."

The British captain sent back the message "I am stopped," but at the same time told his engineer to go ahead for all he was worth, and his wireless operator to send the S.O.S. and the ship's position. "Stop your wireless!" flashed the *M we* (Seagull) and sent a shot across the *Clan McTavish*. The latter then replied with her little six-pounder, which was answered by a salvo of 7in. shell at 150 yards range from the raider. One shot killed fifteen natives who were attempting to



## To Enlist in the Motor Machine Gun Section.

escape in a boat, another carried away a winch on the forecastle. She was hit in the engine room, and also below the water line. The captain and the officer on the bridge calmly worked the ship until she was disabled and then gave in. Next a boat came from the raider filled with men armed with revolvers, who told the ship's company to get together what clothes they could and come aboard. Our friend followed the captain and went off in the *M we's* own boat. They were then lined up on deck, and Mr. du Bois  was questioned by an officer who held a revolver at his head, told him to hold his hands up, and had him searched. Then a sailor flashed an electric torch in his face, and—he laughed as he told us—he thought he was shot. Next day they were all put into the hold, where they found 250 prisoners taken from another ship. Next day all these were transferred to the *Appam* except thirty naval and military prisoners. Meanwhile the *M we* headed S.W. The prisoners were fairly well treated, and were allowed on deck for about an hour a day, except when there was a "show" on.

### Scare Caused by a Pig.

On January 22nd they picked up the sailing ship *Edinburgh*—an easy catch. Some stores and twenty-two prisoners were taken, and one of the *Clan McTavish's* men said he was sure the captain had had his wife with him as he had heard her screaming. This fortunately proved to be untrue as the scream came from a captured pig! The Huns then sank the *Edinburgh*. All the *Clan McTavish's* men were told they would be sent to Germany—news which by no means cheered them; and so they sailed on for some time and then reached muddy water, supposed to be the mouth of the Amazon. Here they were battered down for three days and three nights while they went up the river. Near here they picked up the *Corbridge* and later sank her. Next they caught the Belgian steamer *Luxemburg* and sank her too. Then they headed for the island of Fernando Narhona and captured the *Flamenco* and sank her.

By this time the *M we* was pretty full of prisoners. The *Westburn* was the next victim, and on her they put a prize crew, so when the *Horace's* turn came they sank her and put her crew on the former. Off Teneriffe the *Clan McTavish's* men were put on the *Westburn*, and the *M we* departed for a destination unknown. Then at last our heroes' trials were nearly over, as they told the *Clan McTavish* crew that they might all go free except the captain and the gunners. After Mr. du Bois  and his companions had been landed, the prize crew took the *Westburn* out to sea to a spot within the three-mile limit. A bomb was placed each side of her at a point between two holds so that four holds were blown into in all. The

*Westburn* took some time to sink, but gradually settled down on an even keel; then her stern went under, she raised her stern in the air till her foremast and one funnel were parallel with the water, and then sank beneath the waves. This incident occurred in sight of a British cruiser, which was powerless to intervene as it happened in neutral waters. The *Westburn's* prize crew then came back to land in boats and were interned, Teneriffe being Spanish territory. They

stated that they were glad to be out of the war. All agreed that the pirate commander-captain, the Burgrave Count von und zu Dohna-Schlodien, and his men behaved like sportsmen, but the brave *Clan McTavish* crew were none the less pleased to leave Teneriffe for England in the British liner *Athenic*.

[Mr. Du Bois's regret is that he is precluded from combatant service, as he was compelled by the Germans to give his parole.—ED.]

## GOOD SIGNS.

### EXPORTS INCREASE.

IT is gratifying to gather from the latest Board of Trade returns to hand, *i.e.*, those for February, 1916, that there is an appreciable increase in the number of motor cycles exported last month compared with both the previous month and the same period of last year.

As regards imports, the latest figures reveal an interesting fact. While the number of complete machines imported has decreased by 50% compared with the previous month and is an almost infinitesimal figure compared with February, 1915, the value of tyres and parts does not show such a difference.

For instance, in February, 1915, the value of tyres and parts imported into this country was £4,730, whereas last month it was £6,341. The number of complete motor cycles for the same periods are 501 and 8 respectively. This rather suggests that importing firms, in order to economise boat space, are

### IMPORTS DECREASE.

sending their productions to this country in parts to be reassembled here.

Looked at as a whole, the latest returns are satisfactory in that they show a lessening of the great gap existing until recently between imports and exports. This, of course, applies to the trade of the country generally, and the following figures show that the motor cycle industry is doing its part in the placing of the country on a more satisfactory economic condition.

#### IMPORTS.

	Feb., 1916.	Jan., 1916.	Feb., 1915.
Number ... ..	8	15	501
Value, complete machines	£347	£721	£20,667
Value, tyres and parts ...	£6,341	£19,196	£4,730

#### EXPORTS.

	Feb., 1916.	Jan., 1916.	Feb., 1915.
Number ... ..	1,133	836	474
Value, complete machines	£49,960	£38,463	£20,006
Value, tyres and parts ...	£30,613	£31,602	£15,424

## AUTOMATIC LUBRICATION.

### The Desirability of Supplementing Suction-drip in Cold Weather.

ONE of the machines I have been riding this winter—a vivacious 7 h.p. twin which requires lubrication in proportion to its vitality—is provided with a system of lubrication which depends upon suction from the crank case. This system is delightful so long as the temperature allows the oil to flow easily through the regulator; but during the winter months this temperature is not obtained till four or five miles have been covered, with the result that the engine is starved of oil if one's riding consist of short journeys.

In many respects the suction feed is vastly superior to the drip-feed, but it is, to my mind, inadequate unless a hand pump be fitted in conjunction. I notice the makers of my machine have this very necessary addition on the machines they themselves use for demonstration purposes, though the machine they sell to the public is fitted with the suction system only.

I have partly got over the difficulty by using moderately thick engine oil diluted with a few drops of petrol. The oiler is set at full steam ahead for the first three or four miles, whereupon the engine just begins to smoke; then the valve is shut down to the "normal feed" position, by which time the device has commenced working and requires no further attention.

When one has learnt the tricks of the trade, the suction system leaves little to be desired; but I know one novice who was landed for a new set of bearings on a brand new machine almost his first trip, simply because he was not acquainted with the fact that thick cylinder oil would not serve his purpose.

H.M.B.

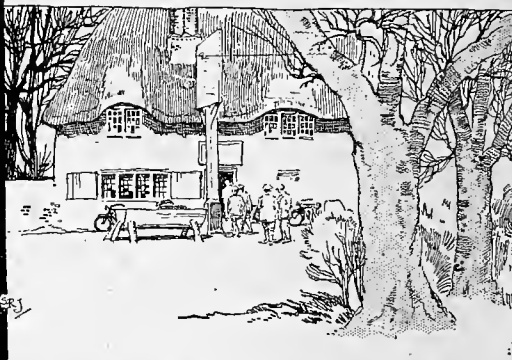
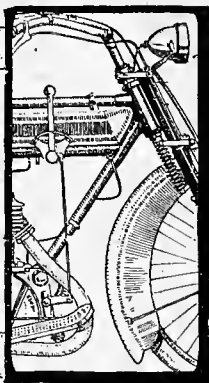
Mrs. Lynton, of Huntspill, Somerset,  
an enthusiastic rider of a two-stroke  
Levis





## A Beginner's 1,200 Miles Tour.

Adventurous "First Run" from  
London to the Highlands and  
Back on a Lightweight.



**W**HEN my friends heard that I proposed to spend my holiday on a motor cycle they scoffed, naturally enough. Had I ever ridden before? No? Good gracious! Where was I bound for? "From London to Inverness-shire," said I, dubiously. Huh! Did I not know that those infernal machines required attention every twenty miles at least? Jones, the egregious one, was especially scornful, being himself a motor cyclist.

### An Alarming Prospect.

"What will you do, old chap," he pleaded anxiously, "when it is absolutely necessary to belay the carburettor? And *won't* you be in a pretty fix on some lonely moorland road, ten miles from the nearest house, when the machine refuses to budge, owing to the flooding of the high-tension grease spot!"

But I held to my purpose, so intent was I on taking advantage of the use of an almost new lightweight which I was offered for the fortnight.

The cycle was a 1915  $2\frac{1}{2}$ -3 h.p. Wolf, with two-stroke engine and single speed. Surely it is very much to the credit of the cheap modern motor cycle, and of the two-stroke engine in particular, that this machine should have run for well over a thousand miles, with the minimum of trouble, in the hands of a beginner, who had received only two minutes' instruction concerning the use of the brakes, the air lever, and the throttle.

"You see," said the owner optimistically, "there is really very little in a two-stroke that can go wrong. If the engine refuses to fire, look at the plug, which is, perhaps, the thing most likely to upset your calculations." And with this invaluable tip firmly in mind I resolved to start.

On Saturday the journey was begun. The weather was wet, misty, and cold, and with a sinking feeling I surveyed the cheerless prospect from the windows of my rooms. Having reinforced my reserves with an excellent road map and "Hints and Tips for Motor Cyclists," I set out by 'bus for Chalk Farm Road, where I got the motor cycle from the Adelaide Motor Co. Luggage consisted of a fairly large Gladstone bag, weighing about three stone, which, when strapped on the carrier, made an excellent back rest.

### Sound in Theory.

It should be made clear that, from diligent reading of *The Motor Cycle* I had some theoretical knowledge of the general principles governing the control of petrol engines; and it was this, together with the owner's few suggestions, that enabled me to set out in a fairly satisfactory fashion. Taking a big breath,

I "paddled" off, the size of my bag behind making a running mount too difficult at this stage. As the machine darted up Adelaide Road my conviction was that there was some reserve of power in the engine, which was doing its best to sling the machine from under me, and leave me and my bag on the muddy road. It was still raining, and Scotland seemed such a very long way off.

All went well until I had ridden cautiously for about a mile along Finchley Road, avoiding the slippery tramlines as much as possible. Then, on a slight gradient, the engine abruptly stopped firing. What, already! I pushed the machine to the pavement at the side of the road, and, in the presence of two interested small boys, unscrewed the plug in a calm and collected manner. It was almost spotlessly clean. A taxicab driver, grinning horribly, informed me that there was a garage about 300 yards along the road, so I replaced the plug and pushed the machine to this kindly haven. It was evidently lucky for me, I thought sadly, that the machine was a lightweight.

### The Expert.

At the garage there was a man, who, with an air of artistic detachment, was playing a jet of water from a hose on a muddy car. I waited for about two minutes, and then ventured a hint by blowing my horn. He turned off the water, and regarded me solemnly. "Well!" said he.

"This — machine won't go," I told him, and went on to explain how it stopped. He looked at the motor cycle in much the same way as a confirmed bachelor regards a three weeks old child.

"Imphm!" he ejaculated, after a long pause. "Have you tried the plug?"

"I have, and it's all right." This with a touch of pride.

Another long pause, during which he got down on his knees and stared fixedly at the flywheel. Then he had an idea: "Just you give it a turn along the garage," he said, "to see if it will fire now!"

I was already uncomfortably hot, but I did as he suggested—to no avail. The expert regarded with interest my hectic dashes from one end of the building to the other, and, when at length I stopped, he had the nerve to say that he was blown; further, he dunno what ailed it, and he advised me to wait for half an hour, when a man who was "well up in them things" would arrive. I did so, and I was able to go on my way rejoicing after an alert-looking young man had brushed up the magneto points and played with the carburettor.

## The new tyre for "A.J.S.," "Indian," etc.



*Avon Three-Ribbed with Voiturette (motor flat-bed) beads.*

**T**HIS new Avon cover has been specially built for heavy machines with voiturette (flat-bed) rims, such as the "A.J.S.," "Matchless," and "Chater Lea" (fitting 650 x 65), or the "Indian," "Harley-Davidson," "Williamson," "Henderson," and so forth (fitting 28 x 3in.)

Needless to say, the new Avon Three-ribbed has the correct type of car beads as well as extra wall-strength and generous weight of rubber. We confidently commend it to every "big" owner.

### SIZES AND RETAIL PRICES.

	Cover.	‡ Tube.
*28 x 3in. (for American rims) - - -	£2 8 4	12/3
650 x 65 - - - - -	£2 0 0	"
*650 x 65 Extra heavy - - - - -	£2 3 8	"

\*Four-ply Casings.

‡ With Bolt Valve.

**THE AVON INDIA RUBBER CO., LTD., 19, Newman St., Oxford St., W.**

WORKS: Melksham and Bradford-on-Avon. MANCHESTER: 38, King Street West. GLASGOW: 55, Queen Street. BIRMINGHAM: Broad Street Chambers. BRISTOL: 119, Victoria Street. NEWCASTLE: 5, Gallowgate. NOTTINGHAM: Mansfield Road. ABERDEEN: 106, Union Street. SWANSEA: Fisher Street. PARIS: 88, Avenue des Ternes.



*The Symbol of Endurance.*

*In answering this advertisement it is desirable to mention "The Motor Cycle."*

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# The 3 $\frac{1}{2}$ h.p. SUNBEAM

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A 3 $\frac{1}{2}$  h.p. Sunbeam owned and driven by Mr. E. Kickham, of Bristol (on February 13th), succeeded in climbing the notorious **NAILSWORTH LADDER** with **SIDECAR & PASSENGER**

This is the first clean ascent by a 3 $\frac{1}{2}$  h.p. Passenger Combination.

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SUNBEAM DESIGN AND WORKMANSHIP SCORE EVERY TIME.

Complete Catalogue post free on application to

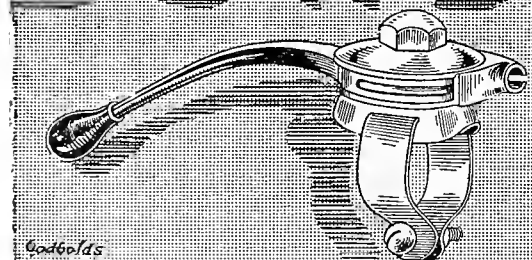
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# LONDON



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# Reading Standard

## THE "ROLLS-ROYCE" OF MOTOR CYCLES.

We concentrate all our efforts on  
**ONE MODEL ONLY.**

Service built into every detail.

Catalogue awaits your enquiry.

1916 Models have now arrived.

**READING STANDARD MOTOR CYCLE CO., 28 & 29, Baker St., Portman Square, LONDON, W.**

Tel.: "Clairmat, London."

'Phone 508-563 Mayfair.

**A Beginner's 1,200 Miles Tour—**

Some evilly disposed, or perhaps ignorant, person had told me that St. Albans was on the Great North Road, so that when I saw a signpost pointing the way to that town, I made for it with unquestioning faith, rode through the crowded streets, and continued my way along a broad fine highway that appeared to be almost deserted, and promised unlimited speed.

This was glorious. The craving for speed was on the ascendant, and the milestones went flying by. In a happy frame of mind I was not disposed to stop, and it was not until I had covered nearly sixty miles from London that a large signpost, pointing in the direction in which I was travelling and marked "To Holyhead," made me pull up with a jerk. Where on earth was I! My perplexity increased when I saw another signpost pointing to the right, and declaring that that was the way to Northampton. The map was consulted, and I was soon bewailing my idiocy in not consulting it sooner. Evidently I had been travelling along Watling Street and was at that moment about thirty miles from the nearest point of the Great North Road!

**The Empty Tank.**

The obvious course in this predicament was to make for Northampton, about twelve miles away, and then strike north-east through Kettering and Stamford. This I decided to do, and I left the main road: but it was willed—no doubt for my ultimate good as a motor cyclist—that there should be further delay. Just after I had passed through a quiet village about ten miles from Northampton the engine stopped for the second time. For a wonder, I struck on the root of the trouble almost immediately—I had forgotten all about the petrol supply. A glance at the tank showed that it was empty. A passing boy advised me to try the village inn—called, I think, the Coffee Pot—for petrol, so I pushed the machine up a shocking hill back to the village, where the hostess yielded to my entreaties to sell me some of the petrol stored for her husband's car, and further, to obtain from a kindly neighbour sufficient oil to mix with the petrol. Thus equipped I went joyfully on my way, and about 7 p.m. reached Northampton, where I decided to put up for the night.

Sunday dawned cloudy and unsettled. It was 10.30 before I got away from the garage. The weather held until I reached Stamford, thirty-five miles away. Here I rejoined the Great North Road, and continued the journey in the rain to Grantham, where there was a stop for lunch and petrol; then on through Newark, Retford, and Doncaster. It was shortly after leaving the last-mentioned place that I fell in with the rider of a 3½ h.p. Humber and sidecar, with which he was on his way from London to join his wife at Harrogate. He overtook me while I was examining

my map at cross-roads, and we decided, after one of those informal introductions that occur so naturally in the freedom of the King's highway, to continue our way together to Wetherby, where our roads parted. We rode at a fair average speed, the little two-stroke making an excellent impression on my companion.

At Wetherby I said good-bye to my new friend over a tankard of ale, and pushed on alone to Boroughbridge (about twenty miles north-west of York). This was the end of my second day's run. I had covered about 150 miles from Northampton, a total which I regarded with infinite satisfaction. At Boroughbridge I found the Crown Hotel to be in keeping with the village—comfortable, quiet, and old-fashioned.

**Again no Petrol !**

There was heavy rain all the morning, and the belt, which had developed some slackness, was slipping on hills, though not very badly. The petrol supply was replenished at Darlington, and I continued my way

through Chester-le-Street—where there was a wretched lunch in a very gloomy hotel—to Newcastle. The main road into this city had more pot-holes and was generally in a worse state of repair than any other stretch encountered in the whole of the tour. On the other hand, the North road leading out of the city is capital, and I enjoyed a very fast run to Morpeth and on to Alnwick, where the belt was tightened.

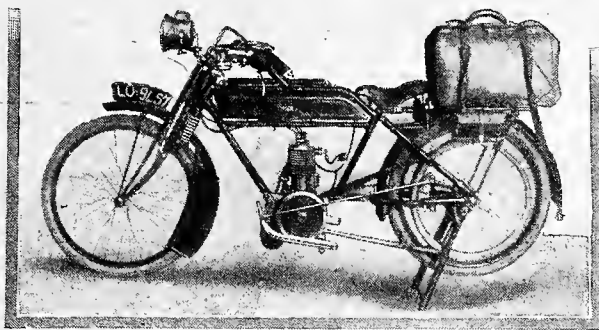
From the summit of the hill leading out of Alnwick

it was easy running until the engine suddenly stopped firing about eight miles south of Berwick on a lonely stretch of road. In a most pessimistic mood I set the cycle on the stand, and went through the motions, so far as I knew them, of locating a fault. It was interesting, and possibly helpful, to find that the carburetter would not flood, and further investigation showed that the tank was empty. Here was a pretty business!

A farmer's son who came along, driving a pony and float, assured me that there was no petrol available within a radius of several miles, although there was an inn about half a mile farther along the road.

By this time I had taken off the belt, and was ready to push my machine to the inn, but awaited a possible friendly offer from my new acquaintance. It did not come, although there was plenty of room in the float.

Luckily with the belt off the machine was almost as easy to push as a pedal cycle, and I reached the promised inn comfortably enough. There was an amiable but futile conference with the landlord, who had no petrol, so I talked of putting up for the night, and he brightened up, business being dull. Just then a car rolled up to the inn, and the owner sold me half a gallon, with which I was able to continue my way to Berwick. Crossing the Tweed, it was pleasant

**THE WRITER'S MOUNT.**

The two-stroke single-geared Wolf, upon which the 1,200 miles tour described in this article was made. The rider was a novice at the time of the tour, which occupied a fortnight.



**A Beginner's 1,200 Miles Tour.—**

to reflect that I was 336 miles from London, and considerably more by the devious route I had chosen.

**Do your Own Repairs !**

At Berwick I put up for the night, discussing the chequered local history of the ancient borough with the landlord of the Waterloo Hotel, Mr. Turnbull, who had much that was entertaining to tell me of the times when the township was the favourite bone of contention between England and Scotland.

The machine started badly next morning, and stopped abruptly in the course of the ascent of High Street. I took it back to the garage, where it was found that the sparking plug terminal was broken. A very young mechanic—he looked about fourteen—repaired this for me. Foolishly enough, he placed the new terminal on the top of the cylinder so that he might hammer the wire firmly into its place. The third light tap took off a piece of the top fin, much to my annoyance.

**An Encounter with Sentries.**

It was not until 10.30 a.m. that I was able to leave Berwick and cross the border. Eight miles out, at

greasy tramlines at the junction of Prince's Street and New Bridge Street being too much for me. This was my first and only serious sideslip. My impression was that the front wheel collapsed suddenly, but on picking up myself and the machine—muddier than ever, both of us—I found that neither was damaged. Luckily I had been travelling dead slow at the time.

At least an hour was lost, and some unnecessary miles were covered, in finding the road to Queensferry. In order to avoid trouble with the Naval Censor, the less said about this very interesting resort at present the better. Many young naval officers were motor cycling into Edinburgh as I left the city, most of them with a passenger on the carrier, and apparently supremely indifferent to the perils of mud and wet tramlines.

**A Wonderful Descent.**

From Inverkeithing, on the other side of the ferry, to Perth there is a succession of small townships, each with its ten-mile speed limit, and each with streets of such an atrocious nature that none save a despatch rider on urgent business would attempt to exceed the limit. Near Perth there is an amazing run down Glen Farg. Mile after mile the road descends into a dark



THE JOY OF THE OPEN ROAD—A good example of Scottish moorland country.

Burnmouth, I was stopped by two sentries, one of whom, in the most businesslike fashion, carried a fixed bayonet, while the other was armed with a pencil and ledger. They signed to me to stop, and prudently I decided to do so.

"What's wrong?" asked I, with some misgivings.

"Spies!" was the succinct answer made by the young man with the ledger, and straightaway they began to ask me as many questions as there were columns ruled in their book. And when I had finally satisfied them, there were two more sentries at the other end of the village, with whom exactly the same formula had to be gone through.

After a pleasant run through Cockburnspath, Dunbar, and Musselburgh, I reached Edinburgh early in the afternoon. A few miles north of Dunbar a bird, flying in front against a head wind, swerved into the head light, and instantly fell into the road, apparently killed on the spot. The glass of the lamp was cracked. The rain was still falling as I entered the Scottish capital. I blush to record that the only stop I made here was an involuntary one, the network of

valley, thickly lined with trees, until one begins to fear that a wrong turning has been taken, leading the unwary and wicked motor cyclist to the nether regions. I reached Perth about 5.30 p.m., and decided to leave the last stage of the journey, the ride over the lonely Grampians, for the next day.

Wednesday morning dawned gloomily and threateningly. Heavy rain accompanied me for the twenty-seven miles to Pitlochry. A mile to the south of that fashionable little health resort, which nestles at the base of the Grampians, I ran into a blinding storm, the rain coming down in solid sheets. I took ten minutes' shelter under a railway bridge with four surfacemen, then rode into Pitlochry, where I had to wait for two hours while the storm spent itself.

It was after three o'clock when I got away from the place, the wheels leaving a wash on the rain-sodden roads like that of a thirty-knot destroyer. Singularly enough, at Blair Atholl, only ten miles to the north, there had been no rain since the previous day.

Then came the ascent of the Grampians. There are surely few highways in this country that equal in

# THE ARRIVAL OF THE 1916 MODEL

# American EXCELSIOR

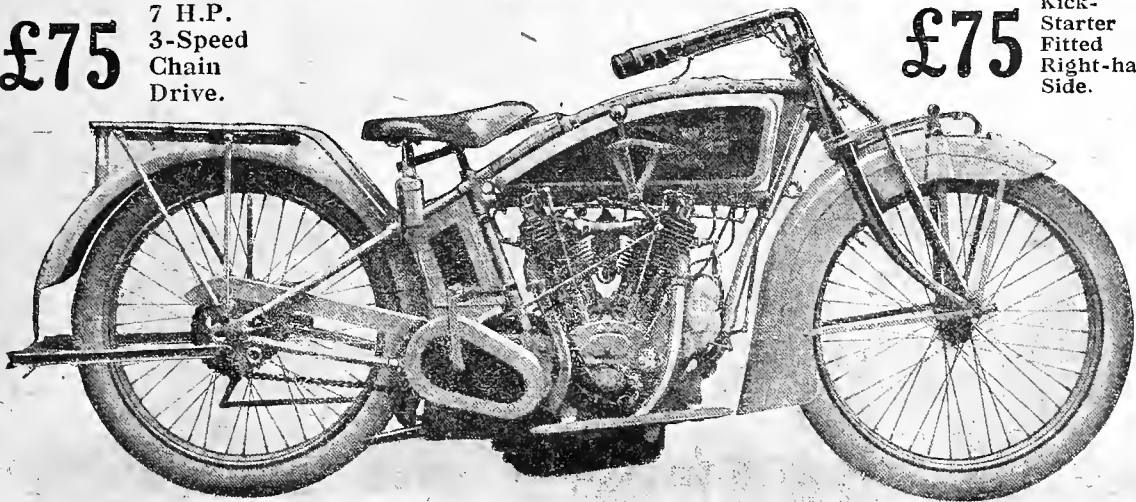
## BETTER VALUE THAN EVER.

£75

7 H.P.  
3-Speed  
Chain  
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Kick-  
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The most perfect motor cycle it is now possible to produce.  
When a better motor cycle is built it will be an Excelsior.  
The serene consciousness of personal safety, with absolute  
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Oxford Street, LONDON, W.

Telephone—REGENT 3906.

*In answering this advertisement it is desirable to mention "The Motor Cycle."*



## TAN LEATHER M.C. COSTUME.

Best Quality Tan Chrome Skins, lined camel fleece.

A magnificent costume for  
Rough-weather Riding.

The coat is double-breasted and cut on smart lines.  
The Trouser Overalls are also lined camel fleece and have  
a strap at the ankle.

Price of Coat - - £2 17 6

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Overalls (lined tweed) £1 15 9

# Dunhills

Ltd.,

359-361, Euston Road, LONDON, N.W.

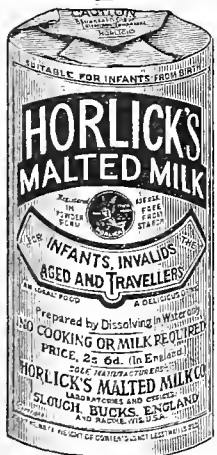
2, Conduit St., W. 42, Lombard St., E.C.

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The Food Drink which promotes  
fitness and efficiency is

## HORLICK'S MALTED MILK



A glass of Horlick's is always the best invigorator. Taken before a ride it will give strength and endurance, and after strenuous exertion there is no better pick-me-up. At all times it gives and maintains fitness and stamina, and is especially useful to men on Active Service.

**SUPERIOR TO TEA, COFFEE, COCOA, AND BEEF EXTRACTS.**

READY IN A MOMENT WITH HOT OR COLD WATER ONLY. NO COOKING.

**Served in Hotels, Cafés, and Railway Refreshment Rooms**

Also available as delicious food tablets to be dissolved in the mouth. Relieve hunger and thirst and prevent fatigue.

Supplied in Sterilised Glass Bottles, at 1/6, 2/6, 11/-, by all Chemists and Stores  
The Tablets also in convenient Pocket Flasks at 6d. and 1/- each.

Liberal sample sent post free for 3d. in stamps.

**HORLICK'S MALTED MILK COMPANY, SLOUGH, BUCKS.**

*In answering these advertisements it is desirable to mention "The Motor Cycle."*

**A Beginner's 1,200 Miles Tour.—**

grandeur this wild and remote stretch of the Great North Road. The surface is good, though the road, winding its way between the great mountains, is rather narrow in places. For twenty miles one continues the climb to the summit at Drumochter, and then slips down the other side of the mountains for about the same distance to Kingussie.

**Five Days in the Highlands.**

There was a thick mist lying over the mountains, adding to the wildness and scenic effects of this rugged countryside. The machine ran excellently, firing regularly at twenty miles an hour on the long ascent, and giving no sign of overheating.

The end of the northward journey was now in sight. The Wolf purred its way quickly through Kingussie and Aviemore to Carr Bridge. My friends—having, naturally enough, little faith in my motoring powers—were honestly amazed to see me pull up at the gate with a final triumphant hōnk, hōnk!

Five memorable days were spent in this quiet, picturesque Highland village, now fast gaining popularity among weedy southerners, who revel and grow fat in the mountain air. In these glorious surroundings,

The return journey was comparatively uneventful, and I was now beginning to understand the machine fairly well. There were, however, one or two lively incidents. At Newtonmore, where, like so many other Scottish villages, there is a 10 m.p.h. speed limit, I was pursued by a fairly large terrier while riding slowly through the main street. I slowed down, and the terrier, barking furiously, took the lead, trying to snap at the front wheel. The sequel was bad for me and worse for the dog. He was run over, and I had an inevitable spill, escaping lightly with only the front of the head lamp broken. The last I saw of the ferocious animal was the merest glimpse, as I was lying in a disadvantageous position in the centre of the road, the motor cycle lying on me: the terrier was tearing up a mountain side, yelping in a frenzied way calculated to awaken any dead Highland chieftains who happened to be buried there.

**TYPICAL SCOTTISH SCENERY.**

For the last twenty miles approaching Glasgow there was very little power in the engine. The fault was quickly diagnosed next morning as being due to the partial choking of the silencer holes. A mechanic at Messrs. Bell's garage, in Great Western Road, put the the two end plates in the vice and cleaned them out effectively. The



(Top) Scenery on the road to Dingwall.

(Left) Emerging from a mountain mist.

(Right) A moorland road over the Grampians.

it was a joy and inspiration to play nine holes before breakfast on the local golf-course, though a plus man might have sneered at its roughness. "Inspiration" is surely not too lofty a word, for my enthusiastic host and I were inspired with courage to dismantle the carburetter and one or two other parts of the Wolf, clean the parts that were accessible with petrol, and put the whole together again.

The internal economy of the engine was much as we expected it would be. What did surprise us was that the machine fired as well as ever—perhaps there was even a slight improvement—after we had completed our reassembling. Like myself, my host knew next to nothing of the practical side of motor cycle mechanism. During my stay in the North I made motor cycle trips to Inverness, Grantown, Aviemore, and other places in the district, sometimes with a passenger on the carrier.

top of my Amac carburetter had been shaken off, and it was a striking illustration of the effects of the war on the motor industry that at no place between Glasgow and London was I able to obtain this simple replacement. A makeshift repair was effected by using the lid of a baking powder tin, boring a hole in the centre for the needle, and fixing it as securely as possible with copper wire. It was far from petrol-tight, and my fuel consumption went up with a bound.

One result of this unexpectedly high petrol consumption was that—for the third time during my tour—I ran out of fuel thirty-four miles from Glasgow on the lonely moorland road three miles from Abington. A passing motorist very courteously gave me enough to carry me on to that village. The road from Glasgow to Carlisle, *via* Beattock, is magnificent; it has a fine surface, many long but not difficult ascents and descents, and pleasantly varied scenery.



### A Beginner's 1,200 Miles Tour.—

Leaving Carlisle on Friday morning, I took the lonely and rough mountain road *via* Appleby, Brough, and Bowes to Scotch Corner, whence there was good running once more on the Great North Road to Newark.

The following mileage is, I think, extremely creditable to the machine in view of the fact that it was ridden by an absolute beginner:

NORTHWARD JOURNEY.		Miles.
London to Northampton (afternoon only)...	68	
Northampton to Boroughbridge ... ..	152	
Boroughbridge to Berwick ... ..	130	
Berwick to Perth ... ..	100	
Perth to Carr Bridge ... ..	95	
	545	
RETURN JOURNEY.		
Carr Bridge to Glasgow ... ..	154	
Glasgow to Carlisle (afternoon only) ...	94	
Carlisle to Newark ... ..	176	
Newark to London ... ..	124	
	548	
Trip mileage in the Highlands (about) ...	107	
Total for fortnight ... ..	1,200	

### A Few Notes.

It will be admitted that the tour was rather an exacting test. I found that my engine gave ample power, even with heavy luggage on mountainous roads and a single gear. The gear was rather low, however, and it was necessary to keep the engine fairly well tuned up. I am told that petrol consumption by two-strokes is often unduly high. Considering my lack of previous experience, I was fairly satisfied with an average of about 100 m.p.g. I did not keep the Wolf, but the only reason is to be found in my new ambition to possess a passenger machine.

I thoroughly enjoyed my first motor cycling holiday, a wholly delightful change from the work and strain of London life. "*Toujours l'audace!*" exclaimed a motoring friend, when I told him of that rainy Saturday afternoon in London when I sat astride a motor cycle for the first time, and set out for the far away Highlands. Certainly my experiences should convince waverers, afraid of illusionary mechanical troubles, that the modern motor cycle is one of the easiest vehicles to drive, as well as one of the most reliable and enjoyable.

D. W. CAMERON.

## "THE LIGHTS O' LONDON."

The Metropolitan Police Area: Further Reduction of Lighting: What is a Tricycle?

IT is most extraordinary that the authorities seem to be absolutely incapable of making an order with regard to the lighting of vehicles which includes all types to be found on the road and at the same time admits of no ambiguity. For instance, powerful lamps are forbidden, but a powerful lamp is not defined; *tricycles* are exempted from the necessity of carrying two lights in front, but it is uncertain whether a three-wheeled motor vehicle is considered to be a *tricycle* or not.

The following regulations are included:

(11.) "The use of powerful lamps on motor and other vehicles is prohibited.

(12.) "Every vehicle on any street, highway, or road to which the public have access between half an hour after sunset and half an hour before sunrise must carry lamps as follows:

(a) "At the front two lamps displaying to the front a white light, except in the case of bicycles, tricycles, and handcarts, on which only one such lamp need be carried. One lamp must be placed on the extreme off or right-hand side of the vehicle, and the second lamp in the corresponding position on the extreme near or left-hand side of the vehicle.

(b) "At the rear, a lamp displaying to the rear a red light. The lamp carried for this purpose on any vehicle other than a bicycle, tricycle, or handcart must be placed on the off side or right-hand side of the vehicle.

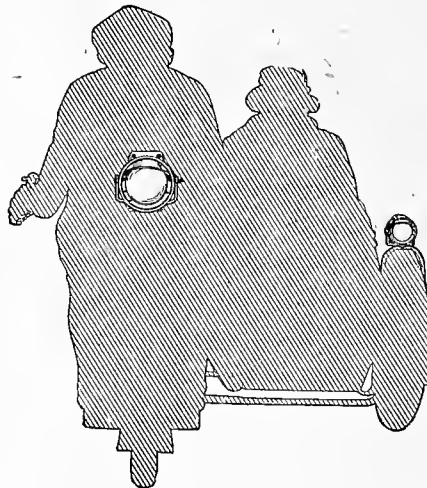
"Provided that a handcart carrying one lamp displaying a white light to the front and a red light to the rear shall be deemed to comply with the foregoing requirements.

"The lamp or lamps must be properly trimmed, lighted, and attached so that the light is visible in the prescribed direction for a reasonable distance without obstruction by any part of the vehicle, its burden, the person in charge, the draught animal, or any animal led at the rear."

It will be noticed that bicycles and tricycles are excepted, but it is not clear whether tricycles include motor cycles and sidecars or three-wheeled vehicles such as the A.C., Morgan, Warwick, etc. It is an extraordinary thing that these vehicles should escape the attention of the authorities, as we consider it to be most necessary that every sidecar at the present time should have lamps showing its full width, and the same remarks apply to the three-wheeled tradesman's carrier of all types. We have called the attention of the officer of the Com-

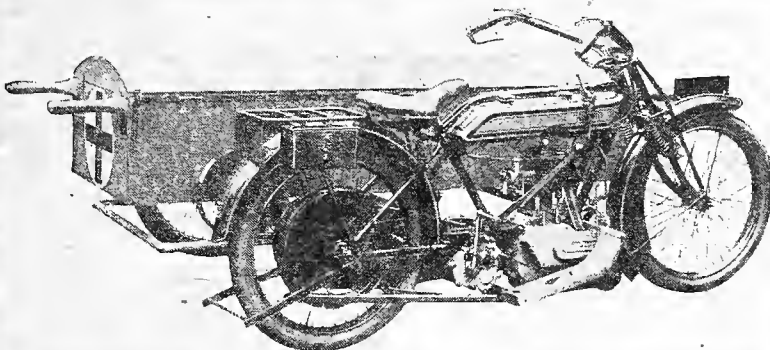
missioner of Police for the Metropolis to the matter and await his decision.

In the Metropolitan Police Order it is not specifically stated that motor cycles and sidecars and three-wheeled trade carriers should carry two white lights in front, but such was clearly the intention of the police. So far, there has been no test case to prove that this is so, but we are informed that in the provinces the police have had no difficulty in enforcing the Order as regards those types of motor cycles.



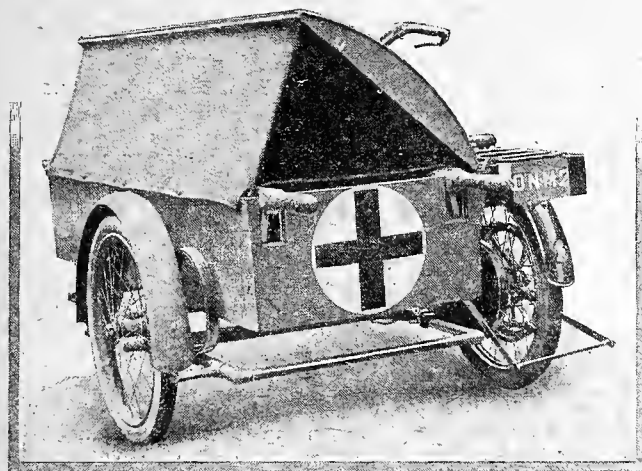
## THE NORTON-WATSONIAN SIDECAR AMBULANCE.

Eminently suitable for either Military or Civil Use.



**W**E are now able to produce photographs of the Norton-Watsonian sidecar ambulance, brief details of which were given in our issue of March 2nd. This ambulance can be obtained either as a complete outfit attached to the 4 h.p. model Norton or as a separate unit for attach-

ment to any suitable machine. Although it was originally designed for ambulance work in connection with the war, there is no doubt that good use could be made of such an outfit for civil ambulance work in small towns where there is not sufficient call for the large motor ambulances such as are used in the bigger towns.



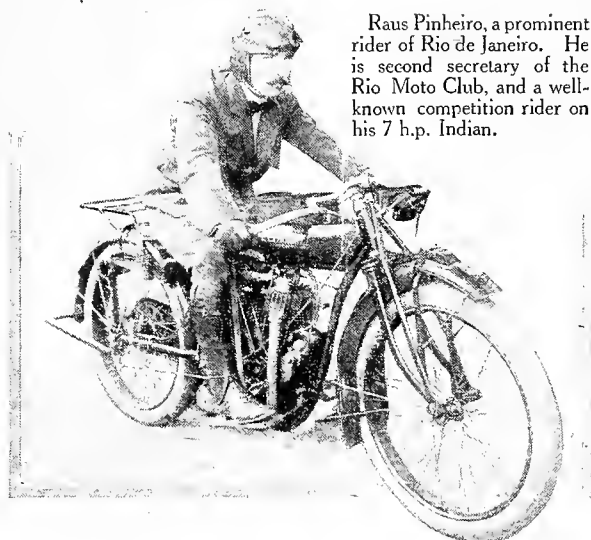
Lid arranged for conveyance of patient.

## AN EASTER TRIAL.

**D**ETAILS regarding the Easter Monday trial to be run by the Birmingham M.C.C., a brief announcement of which has already appeared in *The Motor Cycle*, have now been decided upon, and printed particulars are available for intending entrants. It is to take the form of an open reliability trial, in which may be embodied a petrol consumption test, starting from the top of Griffin's Hill, Selly Oak, at 9 a.m. It is open to everyone excepting single men eligible for military service, and it is expected that a large proportion of the entry list will consist of men engaged on munition work. Ladies are especially invited to compete, and if sufficient entries are received a special prize will be offered.

Honorary Secretary S. Charles Perryman informs us that he has already had some fifty applications for entry forms. There is, therefore, every indication that the trial will be well supported. Entry forms and full particulars may be obtained from Mr. Perryman, Warwick Works, Tame Road, Witton, Birmingham.

The body is constructed of three-ply wood, and is sufficiently large to take a full-sized regulation army stretcher. In order to reduce the vibration and road shocks to an absolute minimum the stretcher supports are mounted on separate springs. The body is fitted with a lid, and when not in use for patient carrying the whole can be shut up and used as an ordinary box carrier. When a patient is to be carried the lid is fixed up by steel supports, and with the aid of waterproof curtains secured by press buttons makes an entirely enclosed, warm and waterproof covering for the patient. The body is carried on a standard Watsonian chassis with large C springs at the rear, while the front is supported on coil buffer springs. Four points of attachment to the machine are provided. The weight of the body complete with stretcher is about the same as the standard touring body. The whole is finished in grey with the exception of the red cross painted on a white circle.



Raus Pinheiro, a prominent rider of Rio de Janeiro. He is second secretary of the Rio Moto Club, and a well-known competition rider on his 7 h.p. Indian.



## TIME TO LIGHT LAMPS

GREENWICH TIME.

March 16th	...	6.33 p.m.
" 18th	...	6.36 "
" 20th	...	6.40 "
" 22nd	...	6.44 "

### Heavy Fine for "Joy-riding."

Lieut. C. A. B. Budd, who is home on sick leave from the Front, was recently fined £10 at Eastbourne for riding a motor cycle at a dangerous speed. When he was stopped by the constable, a lady asked him if he was a despatch rider, but the motor cyclist answered "No, I am a joy-rider."

### Testing a Spring Frame by using Solid Tyres.

In order to test more thoroughly the effectiveness of the springing of his spring frame, Mr. Whiting is having a model built in which the wheels will be fitted with solid tyres. This should undoubtedly prove whether there are any weak points. The Whiting spring frame, it may be added, was described in our issue of November 11th, 1915, page 470.

### Does Joy-riding Exist?

The A.C.U. is making enquiries from the various motor cycle clubs with a view to ascertaining what amount of pleasure motoring is taking place throughout the country. The object is to combat the idea, which the daily papers are endeavouring to circulate, that motor cycles are used to a great extent for joy-riding at the present time.

Sgt. T. H. Hill, 1st Canadian Contingent, who has been with this Overseas force as despatch rider since it first landed at the seat of war. The machine is a 1915 Harley-Davidson, and Sgt. Hill has ridden it continuously in France for the last seven months, during which time, we are informed, the engine has not been taken down



## SPECIAL FEATURES

A TWO-STROKE AFTER 1,000 MILES.

A MOTOR CYCLIST ON THE MÖWE.

A BEGINNER'S 1,200 MILES TOUR.

### A Stolen Sidecar Outfit.

A grey Harley-Davidson motor bicycle, to which a torpedo-shaped Phoenix sidecar was attached, upholstered in blue leather, together with some accessories, was stolen from King Street, St. James's, on the afternoon of March 2nd. The registered number was LO 2521. A handsome reward is offered to the first person giving information which may lead to the recovery of the stolen property to E. C. Lendon and Co., 17, St. Swithin's Lane, E.C.

### Push Cycle like Motor Cycle.

It may not be generally known on this side of the Atlantic that the Hendee Manufacturing Co. make push cycles in addition to the Indian motor cycles. The former in their general outline greatly resemble, but for the absence of the engine, the well-known mechanically-propelled cycles emanating from the same factory. The impression is given by a small tank, shaped and slung *à la* petrol tank, containing a battery for the electric lamp; also by the double front forks and long braced handle-bars.

### The Useful Sidecar.

Farmers throughout the country are, as is generally known, seriously concerned at the shortage of labour, and anything that will economise work is in high favour. Hence, Mr. Claud Campbell, a Hampshire poultry farmer, is pleased to have a 4 h.p. Triumph and sidecar that he uses almost every day for conveying produce to market. Despite very bad roads in the vicinity, this machine has been and is performing most regularly, and Mr. Campbell says that by its employment he is able to attend markets further afield than when he had to rely on horse transport.



A YOUNG MOTOR CYCLIST WHO HAS GAINED THE D.S.M.

C.P.O. Stanley West, attached to the Motor Machine Gun Section of the R.N.A.S., who received the award for gallantry in keeping the Turks at bay during the evacuation of the Gallipoli Peninsula.

### Highest Speed in England.

Referring to the speed of 95.74 m.p.h. covered by the Australian rider Jack Booth on an Indian over a distance of half a mile, it is worthy of note that the highest speed ever accomplished on a motor cycle at Brooklands was 93.48 m.p.h. This was on an eight-valve Indian, the rider being Sidney George, who is now serving as an air mechanic in the R.F.C.

### That Precious Fuel.

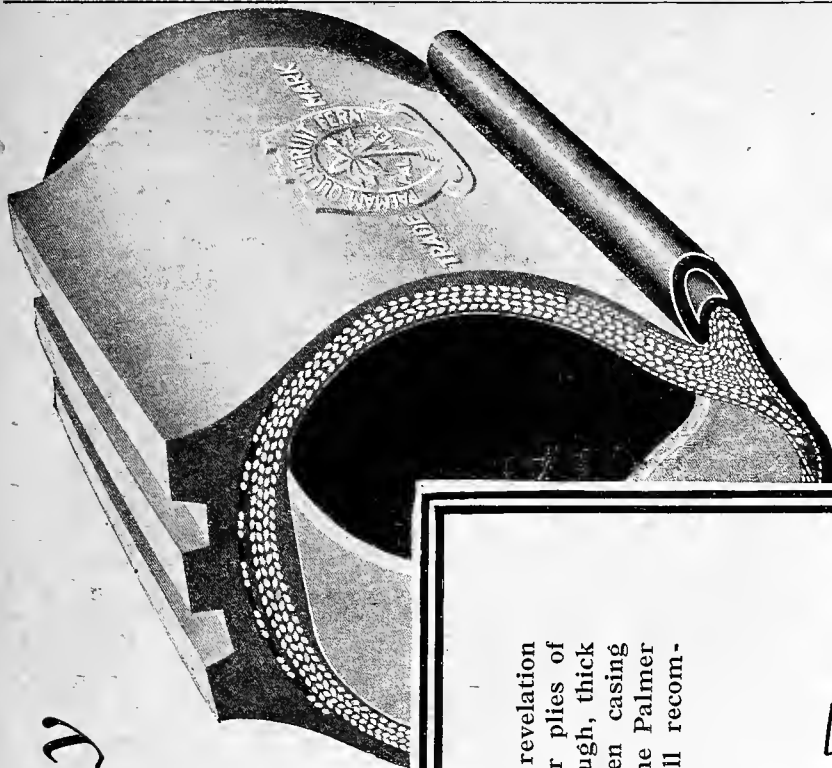
With the prospect of petrol permits in the near future, the most casual motor cyclist will be interested to know how many gallons of petrol were imported last month. The figure is 7,522,377, but, according to the Board of Trade returns, duty has been paid on 8,065,347 gallons for the same period. In January 6,985,276 gallons were imported, and in February of last year the figure was 8,036,659.

### Sidecar Design affected by War.

A Birmingham firm, who up till lately has listed a sidecar chassis in which the main frame consisted of one long length of steel tube in the form of a U, now tells us that, owing to the Government having control of practically all the steel tube mills, long lengths of tube are now almost unobtainable. Consequently, until the termination of hostilities, the firm in question is dropping the single tube chassis and is standardising its model of the more orthodox pattern built up of shorter lengths of tube brazed together in lugs.

# War Time Economy

with Petrol up,  
means saving money  
on Tyres.



The New Palmer Four-Ply Fabric Tyre is really proving a revelation in what can be accomplished by a medium-priced tyre. Four plies of closely woven fabric of almost unpuncturable density, a tough, thick tread, extra reinforcement at the beads, rubber strip between casing and tube, carefulness in manufacture that has made the name Palmer famous the world over — here is a tyre at little cost that will recompense you for the extra you pay out in another way.

Think of Palmer Quality, then compare these  
Sizes and Prices:

	Per Cover.		Per Tube.	
	l.	s. d.	l.	s. d.
24 x 2 in.	1	6 6	6	6 0
24 x 2 1/2 in.	1	13 0	7	7 0
26 x 2 in.	1	7 10	9	9 0
26 x 2 1/2 in.	1	14 4	9	7 7
26 x 2 3/4 in.	1	15 8	10	0 0
26 x 2 1/2 in. to fit 2-2 1/2 in. rim	1	17 2	10	0 0
26 x 2 1/2 in. to fit 2 1/2 in. rim	1	17 2	10	0 0
550 x 65 m/m to fit 650 x 65 m/m	1	17 2	10	0 0
700 x 80 m/m to fit 750 x 80 m/m	2	2 6	12	6 6
28 x 2 in.	1	9 9	9	0 0
28 x 2 1/2 in.	1	16 6	10	0 0
28 x 2 3/4 in.	2	1 0	10	4 4
28 x 3 in.	2	6 6	13	6 6

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LONDON, W.C.  
Motor Cycle and Cycle Tyre  
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Clerkenwell, London, E.C.



# Ariel

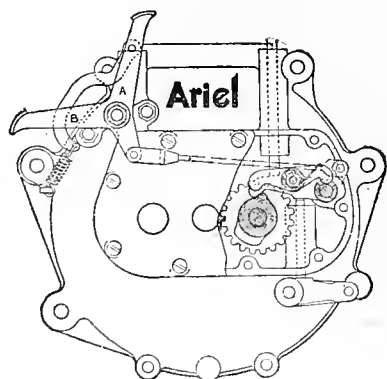
## CONSTRUCTIONAL FEATURES.

### Ariel Patent Decompressor.

This is a simple mechanical device with nothing to get out of order. Its action is positive.

### Guaranteed Easy Starting

Our confidence in this fitment is such that we are prepared to guarantee that we can start every Ariel fitted with the Decompressor within a few yards at a walking pace; also start up immediately with the Kick Starter.



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BOURNBROOK, - BIRMINGHAM.

Harman.

**Our Spring Number**

Thursday, April 13th, is the date fixed for the annual spring number of *The Motor Cycle*. Special articles and illustrations are in course of preparation

**The Sydney Motor Cycle Corps.**

Some forty members of this corps have enlisted for service abroad; the remainder continue to make themselves proficient in home defence. At frequent intervals field days are held, and the motor cycles play an important part

**Competitions Again.**

There are still spasmodic efforts to revive competitions in different parts of the country. Entries from armleteers or Service men are sought. Provided the price of petrol or the conditions of obtaining supplies do not become too impossible, a couple of events may mature at Eastertide.

**The National War Funds.**

At the week-end the principal war funds stood as follows:

The Prince of Wales's National Relief Fund	£3,073,000 distributed	£5,822,921	0	0
Fund for the Sick and Wounded		3,485,947	0	0
The Belgian Relief Fund		1,500,000	0	0
Tobacco Fund		101,665	0	0
The Queen's Work for Women Fund		168,640	5	9

**A Long Ride in Australia.**

A remarkably fine sidecar run has been accomplished by T. Smithson, the postmaster at White Cliffs, South Australia. White Cliffs is roughly 750 miles from Sydney, N.S.W., and Mr. Smithson, riding a 6 h.p. New Hudson sidecar with his wife and child as passengers, covered the distance in a week. When one considers the average Australian road and the fact that the route for the greater part

covered practically uninhabited country, some conception is gained of the performance. The return journey was also made in a week and not a single involuntary stop, we are told, was encountered either outward or homeward.

**Diesel Engines for Motor Cycles.**

Several interesting letters which we have received on this subject have been held over owing to lack of space in our correspondence columns. The general opinion seems to be that the Diesel engine is unsuitable for road work for several very good reasons: (1.) It is made only in large sizes. (2.) Its weight per horsepower is excessive. (3.) It must be run at a constant speed. The fact that the Diesel is made only in large sizes does not, of course, of itself prove that it could not be made in a size suitable for motor cycle work, but the other two reasons seem more or less insuperable. Also, considering the very high compression necessary, we should say that starting the engine would be a matter of considerable difficulty.

**Water as Fuel?**

A bright intellect has suggested that, as the extremely high compression in a Diesel engine, with its attendant heat, is sufficient to cause the combustion of the fuel which is forced into the cylinder in a liquid state, water should be substituted for oil, the idea being that this would be converted into steam, which would do useful work upon the piston. It is hardly necessary to tell our readers that this savours of perpetual motion, and contains a very obvious fallacy. In short the engine is itself expected to produce the energy which is supposed to drive it.

**Motor Cycling in the Philippines.**

Recently racing and hill-climbing contests were held at Bagnio, the capital of the Philippines, and were enjoyed by the inhabitants and natives.

**Fast Travelling in Tasmania.**

According to a Sydney cable, a rider of a Harley-Davidson has travelled from Launceston to Hobart, a distance of 121 miles, in 2h. 34m. 50s. (46.75 m.p.h.). This is claimed to be record time for the journey in question.

**A Youthful Despatch Rider.**

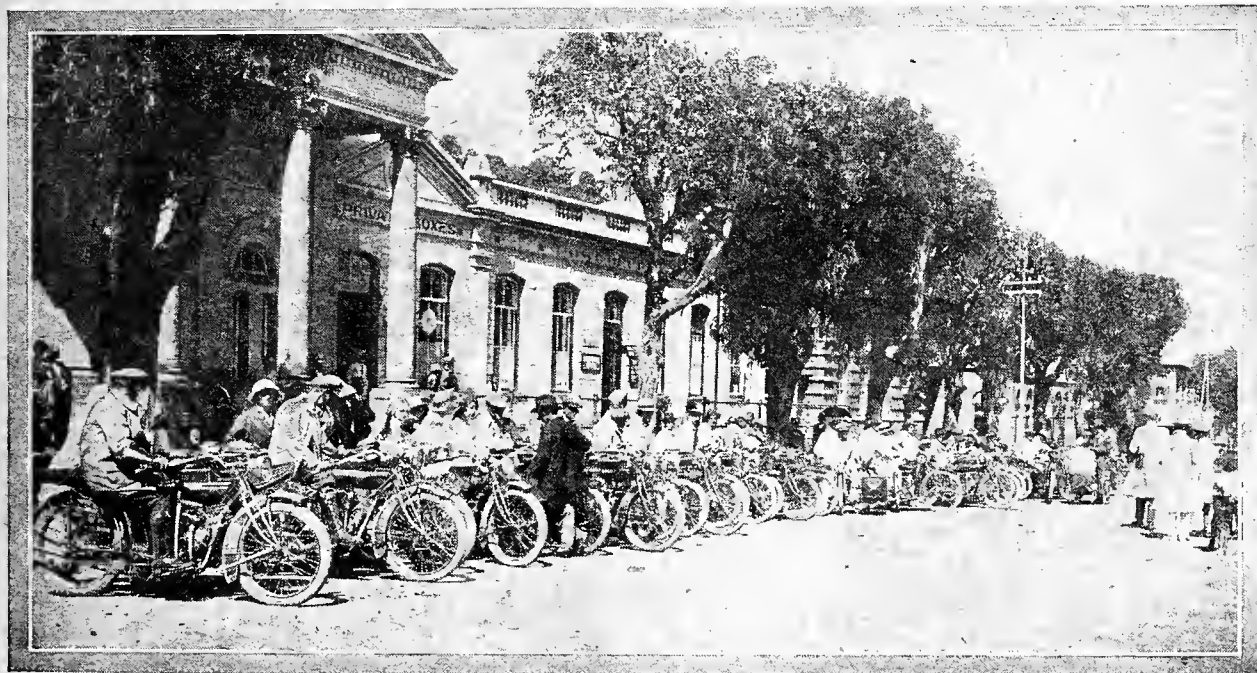
We read that a 13 years old Jewish boy, Reuben Ginsberg, is now on his way home to Montreal after serving twelve months in a Canadian regiment. It is stated that he acted as despatch rider most of the time, and was wounded at Ypres.

**Another Suggested Easter Trial.**

A reliability trial for Sheffield and district riders, to take place on Easter Monday, April 24th, is under contemplation. It will be open to Service men, munition workers, and armleteers, though at the present rate of calling up men there will not be many of the latter class left by Easter.

**At Home Again.**

We lately had a visit from W. C. Hemy, formerly in the sales department of the Service Co., Ltd., and well-known as a competition rider of a Clyno sidecar combination. Hemy joined the Army shortly after the outbreak of war, and has seen over a year's service both with the A.S.C. and as an R.E. despatch rider. Unfortunately, he has been invalided out of the Service, and must take up a civilian appointment again.



THE MOTOR CYCLE IN THE TRANSVAAL.

Members of the Indian Motor Cycle Club photographed at the Krugersdorp Town Hall on the occasion of a picnic held last month. As the name of the club implies, all members own Indian machines, and the large number in the illustration shows the popularity of this make in Johannesburg and district.

# "THE MOTOR CYCLE" RECRUITING SECTION.

Central Office for Motor Machine Gun Service:  
Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

Central Office for R.E. Despatch Riders:  
Mr. T. W. Loughborough,  
A.C.U., Pall Mall, London, S.W.

**D**URING the past week there have been two examinations of recruits for the Motor Machine Gun Service, one on Friday last, the second yesterday (Wednesday), at the Recruiting Office, Coventry. The list of men accepted by Mr. Geoffrey Smith at the first inspection is given on this page. Another fifty men were to be tested yesterday.

Applications for the M.M.G.S. continue to flow into these offices at the rate of about sixty per day, but in many cases they cannot be dealt with, owing sometimes to the fact that the forms are filled in carelessly and some important question left unanswered, or men request that they be accepted now to join up some weeks or even months hence, or "after the result of my appeal is known," but this is impossible. Readers will save themselves and the Editor much time and trouble if this fact be borne in mind. The applications for men ready to join up within a week or ten days of applying are at present quite sufficient to fill up the vacancies as they occur.

The next inspection of applicants is to be at the Recruiting Office, Masonic Buildings, Coventry, on Tuesday afternoon next, the 21st inst. Experienced

motor cyclists who are not called up in their groups prior to that date, and who can attend prepared to proceed at once to their training centre if accepted, are invited to attend between 2 and 5 p.m. Men of good physique with at least a year's motor cycle or car driving experience and medically fit for Overseas service are wanted.

## Important Note.

The Motor Machine Gun Service is now a part of the Machine Gun Corps, the formation of which was sanctioned by H.M. the King some months ago. Men accepted for the first named section are not necessarily employed in conjunction with machine gun sidecar outfits as hitherto, but may be drafted to armoured car work in all its branches.

A double page photograph of the First Light Armoured Motor Battery appeared in this journal of the date of February 24th. In these batteries are armoured cars with motor cycle mounted infantry as supports.

The conditions of enlistment are appended:

Pay, 1s. 2½d. per day, all found.

Enlistment for duration of the war.

Usual separation or dependent's allowances.

A form of application appeared in the last issue of this journal.

Owing to the absence of vacancies a number of motor cyclists who had been on the waiting list of the R.E. Signal Section for several months past were included in the week's recruits for the M.M.G.S.

List of men accepted on March 10th, 1916:


H. A. Allibone, Rushden.  
G. H. Bacon, Leicester.  
B. W. Bailey, Walsall.  
F. Barker, Berkhamsted.  
A. Barrett, Coventry.  
C. E. Bond, Bournemouth.  
A. Boswell, Coventry.  
O. W. Boulton, Redditch.  
A. Brockwell, Clapham.  
A. Brough, Leek.  
J. W. Brown, Hythe.  
E. Burgess, Dipton.  
G. Butler, Wolverhampton.  
C. Careless, Gamlingay.  
L. C. Chapman, Tideswell.  
W. Churchill, Leaford.  
C. Cocking, London.  
A. J. Crichton, Glasgow.  
A. Dean, Sutton-in-Ashfield.  
F. J. B. Donovan, Harborough.  
G. T. Dunkley, Kettering.  
F. J. Elliott, Burslem.  
J. A. Gill, Coventry.  
D. Godley, Mansfield.  
G. Gorman, Handsworth.  
H. Hammond, Blackpool.  
J. W. Harris, Kettering.  
E. C. Harvey, London.  
R. Herrick, Nottingham.  
T. Hood, Whitley Bay.  
H. R. Hope, Newington.  
L. Kemp, Cleethorpes.  
H. C. Kirkby, Leven.  
H. W. Locker, Lichfield.

(Continued on next page.)

## 5th LIGHT ARMOURD MOTOR BATTERY.



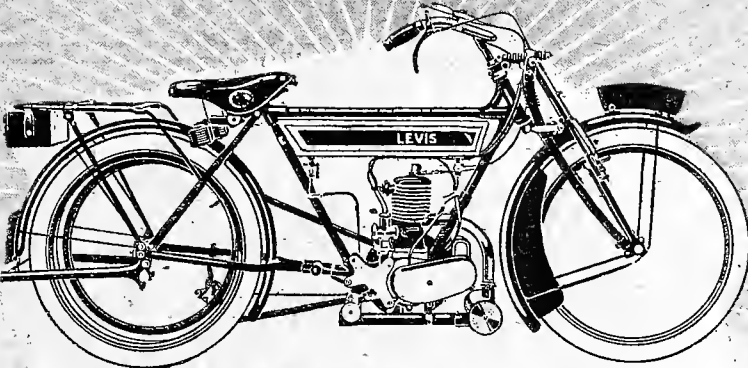
The officers are, from left to right, Lieut. A. R. Gurney, Capt. Scriven, and Lieut. W. T. C. Barnes. The first battery of this kind, with its complete equipment of Leyland armoured cars and Triumph motor cycle mounted infantrymen, was illustrated in our issue of February 24th.



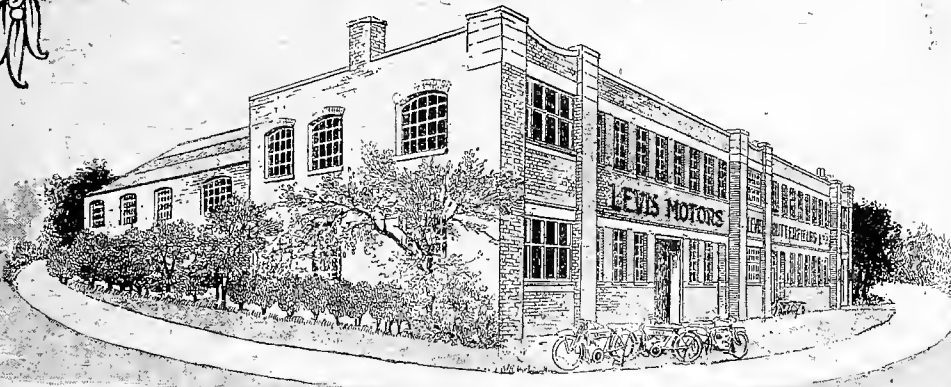
# The LEVIS

## TWO-STROKE

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Two-stroke



**BUTTERFIELDS LTD**  
... LEVIS WORKS ...  
**STECHFORD BIRMINGHAM**



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Motor Engineers,  
**ALDERSHOT.**

'Phone : 195.  
Wire : "Lawes, Aldershot."

**L**ewis  
**E**ngines  
**V**ery  
**I**deal  
**S**ervice.

All Models  
in Stock

♥  
Spare Parts.

♥  
Tyres

♥  
Repairs.

# North Country Motorists

are cordially invited  
to inspect the . . .

# New LEVIS Models

at the Depot for

**NORTHUMBERLAND  
and NORTH DURHAM.**

# J. ROBERTSON & CO.,

94, Northumberland Street,

**NEWCASTLE-ON-TYNE**

# F. BANNISTER,

Railway Street,

# CHATHAM

Being the Sole Agent of Mid-Kent

for **LEVIS** Motor Cycles,

begs to announce that he has now in  
Stock a good supply to choose from.

—○—  
LIST ON APPLICATION.



# LEVIS MOTOR CYCLES

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Repairs of all  
Motor Cycles.

Large Stock of  
Spares and Accessories.

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The **LEVIS** has made this the day of the  
**TWO-STROKE.**

The **TWO-STROKE** of to-day is the  
**LEVIS.**

Secure immediate delivery from

**BRADSHAW'S,  
THE MOTOR HOUSE,**

82, Fishergate,

**PRESTON,**

Tel. : 988.

LANCS.

**"The Motor Cycle" Recruiting Section.—**

L. C. Lose, Plymouth.  
O. O. Mabbutt, Coventry.  
F. R. Maddy, Hay.  
H. Marshall, Birkdale.  
F. H. Mason, Cockermouth.  
P. J. Maybury, Winchester.  
W. H. Mills, Coventry.  
B. M. Mitchell, Isleworth.  
J. Monk, Wingate.  
C. Morgan, Wigmore.  
F. Mouzer, Birmingham.  
A. M. Murch, Seven Kings.  
C. J. Nash, Whitchurch (Salop).  
J. H. Nobbs, Gillingham.  
A. G. Parker, Gt. Malvern.

A. Pearson, York.  
A. Raine, Dipton.  
T. Rayner, Troeyrhiv.  
G. J. Reading, Reading.  
F. Roberts, Preston.  
O. W. Roberts, Liverpool.  
T. W. Roberts, Swansea.  
J. Rutherford, Otterburn.  
H. Scott, Burslem.  
W. H. Seage, Market Harborough.  
A. V. Sbarman, Gillingham.  
H. Shelton, Lichfield.  
C. Smith, Leicester.  
R. Smith, Goole.  
W. A. Stanley, Burnley.  
H. Stansfield, Brighouse.  
T. Stevenson, Kirkcaldy.

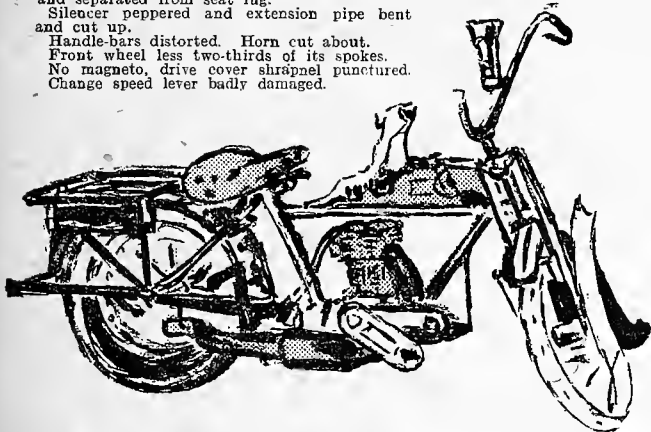
F. N. Thackwray, St. Anne's-on-Sea.  
A. W. Tolley, Slough.  
H. S. Tompkins, Coventry.  
W. Wallis, Stockport.  
W. G. Walton, Reading.  
W. J. Warren, Plymouth.  
H. Whitfield, Bilston.  
F. Windle, Skipton.  
A. Wolfman, Liverpool.  
A. E. Wood, Sneyton.

The number of applications from motor cyclist recruits personally dealt with by Mr. Geoffrey Smith, Editor of *The Motor Cycle*, has grown to 7,516

**MILITARY NOTES.****WHAT ARMY REPAIRERS HAVE TO CONTEND WITH.**

THE reproduction on this page of a damaged motor cycle is from a rough sketch made by a repairer at one of the bases in France. It was made from an actual machine that had been hit by shrapnel, and the extent of the damage may be gauged from the following:

Tank in ribbons.  
Oil pump cut in two.  
Second tube bent and top tube blown away.  
Down tube bent and rear stays badly damaged and separated from seat lug.  
Silencer peppered and extension pipe bent and cut up.  
Handle-bars distorted. Horn cut about.  
Front wheel less two-thirds of its spokes.  
No magneto, drive cover shrapnel punctured.  
Change speed lever badly damaged.



A W.D. Triumph motor cycle after being hit by shrapnel. Reproduced from a rough impression made by an artificer at a repair base in France

From this one gathers that the work of motor cycle artificers calls for all their previous experience in civilian life in the repairing of machines. Our correspondent was at one time in the testing department of a well-known Coventry firm.

**DESPATCH RIDERS' MACHINES.**

OF the letters we receive every day from despatch riders at home and abroad, the great majority speak in high terms of their mounts, and the minority suggest minor alterations and improvements as a result of experience on active service. It was, therefore, rather a surprise to have a letter from a sergeant in an R.E. Signal Co. a few days ago, criticising from every point of view the motor cycles supplied to despatch riders. Our correspondent indulges in a very drastic criticism, and says that it is time the manufacturers supplied machines for the job, instead of machines similar to those sold to the ordinary public.

Nobody suggests that the despatch rider's mount is perfect, but we hardly

agree with our correspondent that the average machine is as bad as he would have us believe. And now that manufacturers interested have seen their productions at work under active service conditions, the points that do require improving will doubtless receive attention.

**A SAILOR MOTOR CYCLIST.**

THERE is nothing a sailor on leave likes better than a run on a motor cycle. When, in addition, he was in the trade before taking to the sea at the outbreak of war it is certain that he will leave no stone unturned to have his wish gratified when he gets a few days on land.

W. Goodwin, a snapshot of whom appears on this page, belongs to the latter class. Before the war he was chief tester to the Bradbury Co.; now he belongs to the Senior Service.

The outcry against so-called pleasure motoring Goodwin, like all of us, considers absurd, and he instances how much he appreciates a

good run on a motor cycle after the strain of watching for the enemy on board a big war vessel.

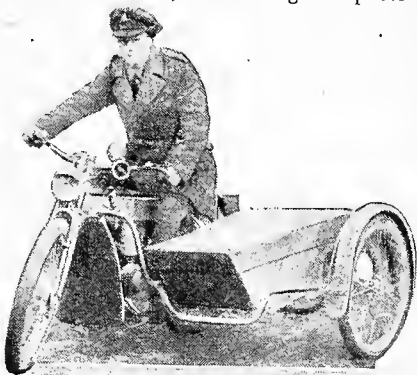


W. Goodwin, formerly chief tester of the Bradbury Company, and now in the Senior Service, goes for a spin on the occasion of a few days' leave.

In conclusion, Goodwin pays *The Motor Cycle* a compliment by saying how it has brought friends closer together during the war. "I myself have been able to locate motor cyclists from whom I should never have heard had it not been for your paper."

**SIDECARS FOR MILITARY RIDERS IN WINTER.**

GEORGE TOWNSEND, formerly a tester employed by Messrs. Phelon and Moore, in sending the photo-



Military P. and M. with light sidecar, being an adaptation of the scheme suggested by *The Motor Cycle* in the early days of the war to overcome the difficulties encountered when riding solo over winter roads in the war zone.

graph reproduced herewith, says: "I send you a photograph of the P. and M. after twelve months' active service in the most advanced positions over the worst roads. This is still going strong with the 4th Batt. Duke of Wellington's." The sidecar is one of the few specially light ones built by Messrs. Phelon and Moore for the War Office according to our suggestion to overcome difficulties encountered when riding solo over winter roads. A more comfortable customary type of body was eventually adopted as a standard.

# OBSTACLES TO OVERSEAS EXPORTS.

## Manufacturers' Evidence of Delays.

**I**N response to our note to manufacturers on page 231 of the last issue, we have been furnished with overwhelming evidence of the delay occasioned (1) on the rail, (2) at the docks, and (3) in obtaining a licence from the Board of Trade to export motor cycles

and accessories to overseas countries.

Several manufacturers reiterate that they are only too anxious to respect Government appeals to specialise on export trade, but they find almost innumerable obstacles in their path. The evidence, with which we have been

provided, we propose to submit to the Board of Trade, in the hope that light on the subject may be the means of an improvement in the existing conditions.

We shall revert to this matter in our next issue, as it is one of considerable importance.

# MOTOR CYCLES ON THE ITALIAN FRONT.

(By our Italian Correspondent.)

**H**AVING been recently privileged to visit one or two towns close to the Italian front, one of which is the residence of the General Headquarters, I should like to give a few of my impressions of the trip.

Of course, there is great activity everywhere, and the motor traffic is most intense, and everywhere the motor has superseded the quadruped. The roads, however, which in that part of Italy were renowned for their good surface, are now in a pitiable condition, partly on account of the extremely bad weather that has prevailed since last autumn (snow and rain being almost continuous), and also on account of the heavy motor traffic, which is so intense that it is absolutely impossible to repair the roads. The mud, therefore, is inches deep and the roads full of pot-holes, which render motor cycling a most arduous and dangerous task, and several casualties amongst the despatch riders are due to falls and skids which cause collisions with other motor traffic. That is one

of the reasons why the sidecar has been so largely adopted in the Italian Army, a suggestion which I remember was put forward in *The Motor Cycle* before the winter campaign.

The largest number of motor cycles are of British make, and I was informed that an order for 100 W.D. Triumph machines had just been placed. There are already some Triumphs in service, besides Ridges, Ariels, Douglas, Matchless, Clynno, and Indians, and the Italian machines are Stucchi, Borgo Frera, and Bianchi. The Motosacoche both 3 and 6 h.p. are largely used, the latter, of course, with sidecar.

## The Repairing Arrangements.

Besides the repair shops at each centre there is one central depot, where all the new machines are sent by suppliers to receive the final test and then be sent out according to the demands of the different zones, and where the machines needing serious repairs and overhaul are also sent. There are about 150 soldiers

working in this place in a most up-to-date and well-equipped workshop, where certain parts, if they cannot be supplied promptly by the makers, are made on the spot. This workshop has also started turning out some motor sleighs, the invention of one of the head mechanics, which are something after the style of those of American origin which have been illustrated from time to time in *The Motor Cycle*, and the first model was fitted with an Indian 7-9 h.p. engine.

Motor cycles are used for despatch riding, and sometimes also for carrying officers (pillionwise) on urgent business and in places where a car cannot get past; and the sidecar machines for the same purpose, besides carrying supplies and ammunition, wounded, and latterly machine guns.

On the whole, I may say that I received a most favourable impression of the motor service in the Italian Army, which seems to be organised on business-like lines, and works with method and regularity.

# THE PETROL SUPPLY AND THE FUTURE OF PRIVATE MOTORING.

**S**INCE the statement in last week's issue there have been no new developments. What we foretold on that occasion still seems likely to be fulfilled. The Royal Automobile Club published an appeal for petrol economy at the end of the week, and though this was sensible and moderate in its suggestions, it erred, in our opinion, in urging the motoring public to support the railways instead of using the self-propelled road vehicle. This seems reasonable at first if we consider that the motor car and motor cycle use foreign "grown" fuel while the train uses coal produced at home, but surely the railways have enough to carry at present, and any mode of travelling which relieves congestion on them ought to be encouraged rather than discouraged. No one desires to spend money unnecessarily during war time, but if motor cycling is enjoyed in moderation and brings health to the brain-weary city worker, it ought not to be denied him if no one suffers in consequence. And no one does. There is plenty of petrol in the country, and even if there were less than there is now the amount wasted in the services would more than suffice to allow every motor cycle in the kingdom to enjoy a few

hours' fresh air in the country during the week-end. It is argued that a brisk country walk is better for the health than a motor cycle ride. This may be so, but those who live in our large towns have to spend train or tram fares to reach a suitable starting point for their perambulations. Wherein then comes the saving? And what about the numerous delicate women who cannot walk? Are they to be denied a health-giving ride in the sidecar? The more one considers it the more one thinks that the appeal of the National War Savings Committee was, as Mr. Gerald Biss says in his excellent article in the *Sunday Times*, the outcome of "gross prejudice and misconception, ill-judged and worse expressed."

## Motorists Combine.

Motorists have at last banded together to utter a most urgent protest against the appeal, and the R.A.C. General Committee has appointed a special sub-committee to gain facts and figures to prove that "joy-riding" is practically a dead letter, and to emphasise the work done by the private motorist and motor cyclist during the war. In this controversy the motor cyclist holds, at first

glance, a more difficult position than the car owner, as it is more difficult for him to prove that his vehicle can be used for other than pleasure purposes, owing, of course, to the fact that it carries one or at the most two persons. It must be remembered, however, that the solo machine, even if used entirely for pleasure purposes, consumes an infinitesimal amount of petrol, so little, in fact, that if the use of the motor cycle were stopped the amount of fuel saved to the nation would not be worth considering. But the solo machine is not the selfish vehicle it is made out to be; it brings the munition worker quickly to the factory, it carries the special constable, the country doctor, and the commercial traveller, while the sidecar machine, as has lately been proved, can and does not only do these things, but is quite useful for the transport of slightly wounded cases. Let us therefore use our motor cycles in moderation; let us buy British machines when we can get them, or if we buy those of foreign make, let us pay the extra duty with all cheerfulness, but let those who have their machines use them for health and business, but certainly in no way so as to prejudice the nation's good.

If you are a keen knowledgeable Motor Cyclist

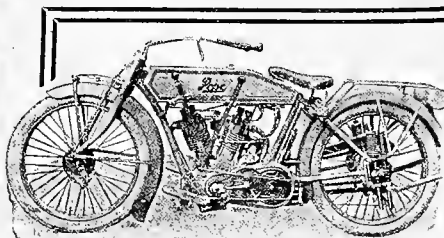
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ITS price,  
and our policy,*

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## A Reader's Opinion

of

**The  
LIGHT CAR**



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"MANY of your correspondents ask questions, some 'Which is the Best Light Car?' and I have not yet noticed the correct answer. Possibly modesty forbids. I have, however, no hesitation in saying that the very best Light Car in which any motorist can invest, with the sure certainty of getting best value for money, is the little cream-coloured paper published every Wednesday.

"I am a knight of the road, and have used motor cars for the past twelve years. By chance I picked up a 'Light Car,' probably attracted by its nice clean get-up, and now look forward to Wednesday morning with pleasurable anticipation. I believe I have read all—or nearly all—the other motoring papers, and would sooner give up my cigars than miss the little cream-coloured 'Light Car.'

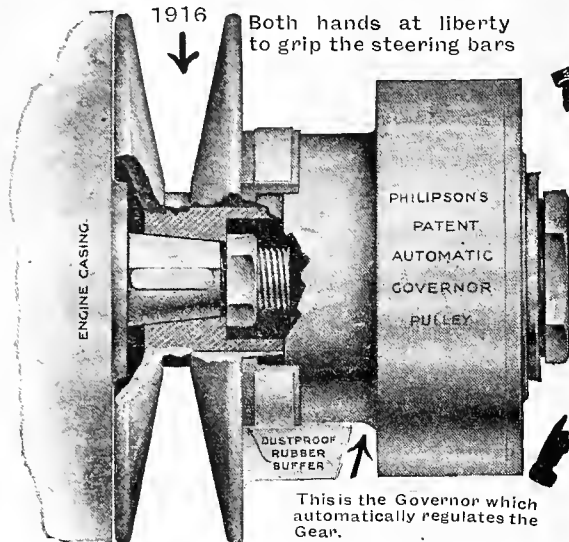
"The correspondence columns are not only extremely interesting, but very informing. 'Disconnected Jottings' by 'Run-about' are always worth reading, and they are the first to attract my attention."

"PUTNEY."



**YOU** cannot purchase a simpler or more perfect variable gear  
**AS SUPPLIED TO HIS MAJESTY'S**  
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See "The Motor Cycle," Jan. 7th, 1916, pages 4 and 5. Extract from article "Some Fads and Fancies," written by Captain A. B. Lindsay, M.B. writing of his 1914 and 1915 3½ h.p.—

"A 'Philipson' Governor Pulley was the only gear used, and with its aid the Machine climbed some alleged roads in Glamorganshire and Breconshire, where no Motor Cycle had ever been before."

Also writing of his 1915 Brooklands Road Special—

"A variable Pulley Gear fitted gave good service, but being severe on the average rubber belt, I substituted for it a 'Philipson' Pulley and fitted up a handle-bar control. This gave a very fine variable gear, and I have yet to find the ordinary road hill that I cannot climb. Belt wear has been slight."

ACCEPT NO GEAR AS GENUINE UNLESS IT BEARS THIS TRADE MARK

ENTIRELY FREE from troublesome and weighty complications—only **2 working parts**—no levers, rods, wheels, etc., to worry about. Simply takes the place of the ordinary pulley (**one nut only secures the complete gear to the engine**)—can be fitted without any alteration to most engines in a few minutes—Send for booklet.

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**SIX.**

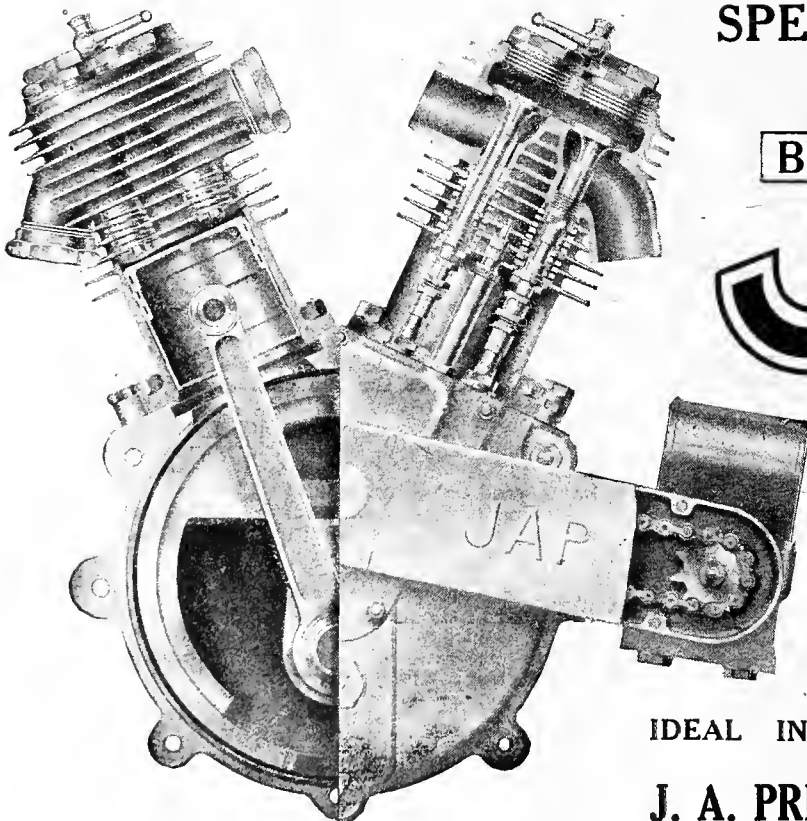
**THE IDEAL ENGINE FOR SIDECAR MACHINES.**

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**IDEAL IN EFFICIENCY AND QUALITY.**

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## SOME A.B.C. IMPROVEMENTS.

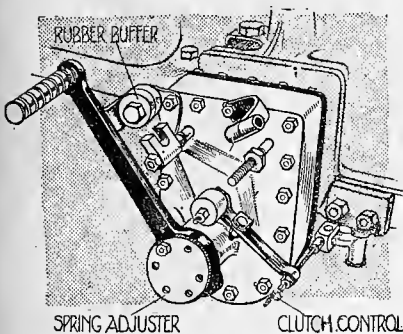
Enclosed Kick Starter; New Shock Absorber.

SINCE our last description of the  $3\frac{1}{2}$  h.p. A.B.C. this interesting machine has been improved in several important details; for example, the kick starter mechanism has been entirely enclosed, so that this important part of the machine is adequately protected from the elements. Many of the machines which have been at the Front, and have not had this protection, have suffered from kick starting gears which have been rendered completely useless owing to the excessive amount of mud they have collected. The illustration shows the neat way in which

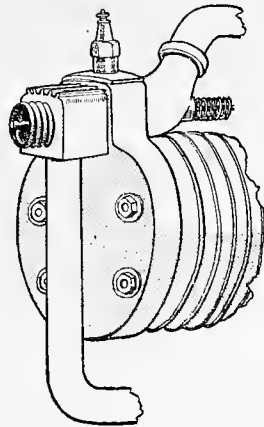
Bowden wire mechanism which actuates the clutch.

## Transmission Shock Absorber.

Yet another item of interest which has received improvement at the hands of the A.B.C. designers is the double cushion drive, a form of transmission shock absorber which is at once neat and effective. Of the two discs shown, that on the left-hand is attached rigidly to the wheel, while the sprocket on the right-hand is mounted loosely. The two are held together by means of bolts and separated by a special form of washer, which really consists of a washer and two short tubes all in one piece. Through these pass bolts, the heads of which are slotted to take a screwdriver, while the end takes a nut; consequently, on the first few impulses of the engine the shock

Enclosed kick starter on  $3\frac{1}{2}$  h.p. A.B.C.

this is carried out in the case of the A.B.C. At the bottom of the pedal it will be noticed that there is a disc with a milled edge with holes in it to which is attached the clock spring, which serves to return the pedal to its normal position after it has been depressed, and if at any time it should require adjustment, this is effected by turning the milled disc just referred to. After it has been used the pedal returns to the position shown in the sketch, and comes to rest against a rubber block. In the lower portion of the illustration there will be seen the



Exhaust outlet arrangement on 249 c.c. A.B.C. engine. On the 494 c.c. engine the outlet is taken from the side of the valve boxing instead of underneath.

on the transmission is absorbed by the rubber blocks, which are sixteen in number.

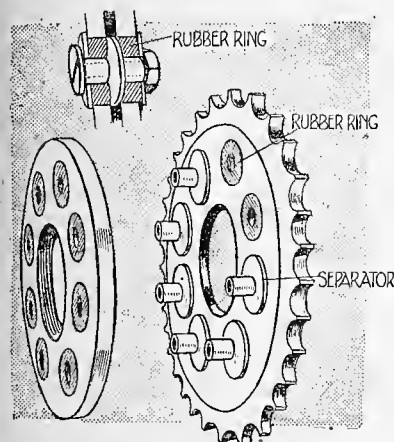
## The Exhaust Valve on the A.B.C. Lightweight.

In the description of the Baby A.B.C. (60 mm. x 44 mm., 249 c.c.), in our last week's issue, it was mentioned that a different type of cylinder head had been fitted, in which the exhaust was underneath. Owing to the omission of the word "outlet," it would lead one to suppose that the exhaust valve was underneath, but this is not the case. The well-known feature of the A.B.C., in which the exhaust valve is of the overhead type, while the inlet occupies the place usually taken by the exhaust, is still retained. This, of course, makes the engine exceptionally cool, as the exhaust valve stem is exposed to the air, and the inlet is cooled by the incoming gases.

Average Prices  
OF  
Second-hand Machines.

From "The Motor Cycle" of March 9th, 1916.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S.	1915	6 3-sp. sidecar	£72	£95
"	1914	6 3-sp. sidecar	£72	—
"	1913	6 3-sp. sidecar	—	£48
"	1913	2 1/2 3-speed	—	£46
Allon	1915	2 1/2 2-speed	£27	—
Ariel	1914	3 1/2 3-sp. sidecar	—	£53
"	1913	3 1/2 3-sp. sidecar	—	£44
Bradbury	1914	6 3-sp. sidecar	—	£63
"	1914	4 3-sp. sidecar	—	£47
B.S.A.	1915	4 1/2 3-sp. sidecar	£62	—
"	1914	4 1/2 3-sp. sidecar	£50	—
"	1913	3 1/2 2-sp. sidecar	—	£44
"	1915	4 1/2 3-speed	£50	—
"	1913	3 1/2 2-speed	—	£32
Calthorpe	1915	2 1/2 2-speed	£27	—
"	1914	2 2-speed	—	£16
Clyno	1914	6 3-sp. sidecar	£63	—
"	1913	6 3-sp. sidecar	—	£50
Douglas	1915	2 1/2 3-speed	£48	—
"	1915	2 1/2 2-speed	—	£43
"	1914	2 1/2 2-speed	—	£33
"	1914	2 1/2 2-sp. kick start	—	£40
"	1914	2 1/2 2-speed T.T.	£35	—
"	1913	2 1/2 2-sp. kick start	—	£32
"	1913	2 1/2 2-speed T.T.	£29	—
"	1913	2 1/2 2-speed	£31	—
Enfield	1915	6 2-sp. sidecar	£68	—
"	1916	6 2-sp. sidecar	£69	—
"	1914	6 2-sp. sidecar	—	£62
"	1913	6 2-sp. sidecar	—	£47
"	1915	3 2-speed	£43	—
"	1914	3 2-speed	—	£33
A. Excelsior	1914	7 2-sp. sidecar	—	£55
H.-Davidson	1915	7 3-sp. sidecar	£72	—
Henderson	1915	4-cyl. sidecar	£80	—
Hobart	1915	2 1/2 2-speed	£29	—
Indian	1915	7 3-sp. sidecar	—	£65
"	1915	7 T.T.	£43	—
"	1914	7 2-sp. sidecar	—	£56
"	1914	7 2-speed	—	£44
"	1914	7 T.T. free eng.	—	£44
"	1915	5 3-sp. sidecar	—	£61
"	1915	5 3-speed	£48	—
James	1915	4 1/2 3-sp. sidecar	—	£57
"	1913	4 1/2 3-sp. sidecar	£40	—
Lea-Francis	1915	3 1/2 3-speed	—	£63
Levis	1915	2 1/2 de Luxe	—	£37
"	1915	2 1/2 Popular	£22	—
Matchless	1915	8 3-sp. sidecar	—	£80
"	1914	8 3-sp. sidecar	£74	—
New Hudson	1915	6 3-sp. sidecar	—	£61
"	1915	2 1/2 2-speed	£26	—
New Imperial	1915	2 1/2 2-speed	£28	—
"	1914	2 1/2 2-speed	—	£25
O.K.	1915	2 1/2 2-speed	—	£30
"	1914	2 2-speed	—	£21
P. & M.	1914	3 1/2 2-sp. sidecar	—	£50
"	1913	3 1/2 2-sp. sidecar	—	£43
"	1913	3 1/2 2-speed	—	£40
Premier	1914	3 1/2 3-sp. sidecar	—	£48
"	1913	3 1/2 2-sp. sidecar	—	£32
Quadrant	1915	4 1/2 3-sp. sidecar	—	£60
"	1914	4 1/2 3-sp. sidecar	£16	—
Rex	1914	6 2-sp. sidecar	—	£48
"	1913	6 2-sp. sidecar	£37	—
Rover	1915	3 1/2 3-sp. sidecar	—	£61
"	1914	3 1/2 3-sp. sidecar	—	£47
"	1913	3 1/2 3-sp. sidecar	£37	—
Ridge	1915	5-6 Multi sidecar	—	£41
"	1914	3 1/2 Multi sidecar	—	£38
"	1913	3 1/2 Multi sidecar	£35	—
"	1915	3 1/2 Multi T.T.	£38	—
"	1914	3 1/2 Multi	—	£36
"	1913	3 1/2 Multi	—	£28
Scott	1914	3 1/2 2-sp. sidecar	£53	—
"	1913	3 1/2 2-sp. sidecar	—	£42
Sunbeam	1915	6 3-sp. sidecar	—	£96
"	1914	6 3-sp. sidecar	£74	—
"	1915	3 1/2 3-sp. sidecar	£71	—
"	1915	3 1/2 3-speed	—	£63
"	1914	3 1/2 3-speed	—	£52
Triumph	1915	2 1/2 2-stroke	—	£36
"	1914	4 3-sp. sidecar	£49	—
"	1914	4 3-speed	£42	—
"	1913	3 1/2 3-sp. sidecar	£50	—
"	1913	3 1/2 3-speed	—	£36
Williamson	1914	8 2-sp. sidecar	—	£64
"	1913	8 2-sp. sidecar	—	£55
Zenith	1914	8 Gradua sidecar	—	£67
"	1914	6 Gradua sidecar	£52	—
"	1913	6 Gradua	£38	—

New  $3\frac{1}{2}$  h.p. A.B.C. transmission shock absorber



### Two-stroke Design.

Sir,—Several makers have, in answer to Mr. Martin's article in your issue of January 20th, eulogised their own particular make, and stated that their machines could be run at wonderfully slow speeds without four-stroking. Be that as it may, particular cases are of no practical importance, and surely no one will assert that the general run of piston-port-operated two-strokes will admit of satisfactory automatic car type carburation. A. C. WICKMAN.

### Pleasure (P) Motoring.

Sir,—I have read with interest the letters of criticism of the National Organising Committee for War Savings proposed ban on pleasure motoring, and I am more convinced than ever that many people still fail to realise the seriousness of the war, and still carry on their pleasures of pre-war times, in spite of appeals from the heads of the nation for rigid economy.

I am living in a district within seven miles of London, in which there are three factories engaged on Government work (I might add that I work in one of them), and the majority of men who ride to work on motor cycles at the present time used to do the same journey on push-bicycles before the war; also several of my friends have purchased machines with the "silver bullets" which should have been invested in the War Loan.

It must be remembered I am writing of a very small spot of the country, so, if that can be taken as a basis, there must be hundreds of new owners during the last twelve months who are motoring for pleasure only. Consequently I endorse the opinion of the N.O.C., since there are other inexpensive pleasures in which to indulge.

I think the phrase "Do your bit" should be displaced by "Do your utmost."

### AFTER THE WAR MOTORIST.

Sir,—With regard to private owners laying up their motors, I think it very hard on such men as myself. I am a miner: I work underground eight hours a day, six days a week, and the only chance I have to steal a bit of fresh air is at the week-end. Has not a man earned the privilege of having a run with his wife after being below all the week in foul air? It is the only bit of pleasure we get. I have not had a ride this year yet, but I have paid my £1 as usual. Shall I lose that also if I have to put my motor away?

UNEASY.

Sir,—I enclose a couple of snapshots taken on Birdlip a few days ago. They were taken just below the second bend. There had been no traffic on this hill for days, the snowdrifts in places being 3ft. to 4ft. deep, and a high-powered car failed hopelessly at the foot of the hill. My machine, which is a 6 h.p. Rex outfit, successfully climbed the hill, but my wife had to sit on the carrier in order to get sufficient grip on the back wheel. The frozen snow very forcibly reminded me of the *pavé* on the other side.

E20

## LETTERS to the EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

I was interested in recent correspondence on "Pleasure Motoring," and I fully endorse "Subaltern's" views in the issue of March 2nd. I am home also on sick leave, and I use my sidecar for health and pleasure, and I venture to think the carping critics of "pleasure motoring" ought to utilise their literary (?) energies in less puerile vapourings:

M. VACY-ASH, Capt., M.T., A.S.C.

### A Board of Selection.

Sir,—A perusal of your paper for February 24th reveals a photograph of a machine giving "universal satisfaction" at the Front. Closer examination of the photograph reveals a leather strap entwined round the front forks. Nearly every machine of similar make that one sees over here is similarly treated. I feel inclined to question the universality of the satisfaction after the number of machines I have seen treated in this way. Riders tell me that their machines are unfit to ride over bad *pavé* until their alleged front springing has been converted into practically a rigid fork. To my mind this seems an irrefutable argument in favour of the Board of Selection, of which your paper has constantly urged the formation.

A Board composed of engineers and practical riders, with a wide riding experience, would never pass as fit for D.R. service machines which when issued required immediate alterations to make them roadworthy. A. LINDSAY.

Boulogne.

Capt., R.A.M.C.

### An Appreciation.

Sir,—I feel almost compelled to write you an appreciation of *The Motor Cycle*, which I receive regularly every week in hospital, and which I also received regularly in France. I think I look forward to receiving this more than any other paper, for it never lacks interest, and is always so up-to-date and persevering in any new ideas which it puts forward.

I joined the R.E.'s in September last, but I could not get on as a despatch rider for there were no vacancies. I was in France about three and a half months when the despatch rider of our company went on leave and I offered to take on his job, for I had had three years' riding experience on various machines. Unfortunately my job did not last long, for on the third day, December 28th, I was wounded, a piece of shell going in just above my hip and entering the backbone, where it still remains. Thus I have what might be termed a "reinforced" backbone. The unfortunate part, one might say the "irony," of the business, however, is that the reinforcement is German iron, and so I am no longer all-British. I am hoping that in spite of my injury I shall be able to indulge in the sport again.

STANLEY LOCK (Cpl.), R.E.



Scenes on Birdlip, taken during the recent snowstorm. (See letter from Capt. Vacy-Ash.)

### The Removal of Cylinders.

Sir,—With reference to the particulars in your issue of the 17th ult. of an alleged patent by F. E. Etwell, Toronto, Canada, and the letter in your issue of the 9th inst. from the Rex Motor Manufacturing Co., Ltd., applying to a device for the easy removal of cylinders. In the early part of 1915 we manufactured and supplied to the public several machines embodying this feature. Our models were so designed that by withdrawing two bolts and operating two specially-designed oil and petrol pipe unions, the tank and bottom rail were separated from the remainder of the machine.

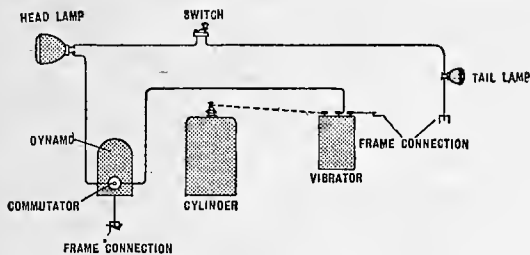
The cylinder on the present-day 4½ h.p. Quadrant is so easily detached that we have not found it necessary to retain this feature, although, in the event of our marketing a twin-cylinder model in the future, we shall in all probability adopt it as standard.

QUADRANT MOTORS.

### A Suggested Electric Outfit.

Sir,—Having read with interest the various articles of late in your paper on the subject of electric lighting, I shall be much obliged if you will kindly publish the following suggestion, which I think should work quite well in practice.

The ordinary magneto with which a motor cycle is usually supplied is removed, and is replaced by a direct current dynamo suitable for burning two electric lamps in series. An ordinary commutator is now fitted to the dynamo, and so timed that it "makes" when the spark is required, and



A suggested electric outfit. See letter from "Midshipman" on this page.

only remains in the make position for about 5° of revolution. From this commutator a lead is taken to a vibrator, and that in turn supplies the plug with high-tension current. The dynamo must be driven at the same speed relative to the engine as the original magneto was, in order that the timing may remain correct. The lead to the head lamps is now taken from the dynamo side of the commutator; thus it does not pass through the commutator at all, and so a steady current for the lamps is thus taken from the dynamo in parallel with an intermittent current for the vibrator.

The reason that the lamps should be in series is that when the vibrator is taking current there will be a slight change in voltage, and if the lamps are in series the change of voltage at each lamp will only be half what it would be if the lamps were in parallel, and hence the lamps will not be so likely to flicker. A resistance in the circuit will help still further in this respect, provided it does not reduce the current too much. A sketch of the connections is appended for the sake of clearness.

MIDSHIPMAN, R.N.

Sir,—The interesting letter under the *nom-de-plume* "Engineer" confirms my own long-formed opinion that the magneto does not by any means represent the last word in motor cycle ignition devices.

For years motor cyclists of the later school have looked upon coil (i.e., transformer) ignition as a system necessarily much inferior to the magneto, since the latter has almost entirely displaced it. The reason for the change, however, is not from any inherent defect of coil ignition as such, but may be found in the unsatisfactory service given by the battery in the olden days, owing to trouble and expense of frequently having the battery charged, or running the risk of getting let down on the road, coupled with the general lack of permanence of the connections.

Those of us who remember the perfect ease of starting, good acceleration, and silky running, even when slowed down on a tolerably high gear, will welcome the possibilities opened up by "Dyna-Transformer" ignition.

(Your pardon, "Engineer.") Why, by the way, does "Engineer" object to the name dynamo? It is the only word we have which describes specifically a machine for creating a difference of electrical pressure by dynamic means. The word generator equally describes a machine for producing petrol air-gas, an acetylene generator, or a dynamo. If the name dynamo offends the aural susceptibilities, let us have some descriptive term, such as "volt-mill" or "amp-churn," which cannot readily be abbreviated, in the way that magneto has been contracted to "mag."

I do not find myself altogether in agreement with his suggestion for a self-starter. In the first place, a very much larger and heavier equipment is required, and an extravagant rate of depreciation is incurred; secondly, the electrical self-starter has been already tried in connection with motor cycles and found wanting; and, finally, with transformer ignition and a good kick starter the personal exertion required is about on a par with winking.

ELECTRICIAN.

### Compression Ratio.

Sir,—On page 218 of *The Motor Cycle* for March 2nd, in the answer to letter from "W.H.," I think there is an error.

With a compression ratio of 4:1 the compression space of a 500 c.c. engine would be  $500 \div 4$ , and not 3 as stated, or  $4 = \frac{500}{x} \therefore x = \frac{500}{4} \therefore x = 125$ . So that the compression space in a 500 c.c. engine having 4:1 ratio would be 125 c.c.

*The Motor Cycle* is a most interesting publication, and such articles as Capt. A. Lindsay's, printed a few weeks ago, are most helpful.

ENGINEER.

[The answer given in *The Motor Cycle* is quite correct, for in calculating the compression the combustion chamber must be included as well as the volume swept out by the piston. Taking atmospheric pressure as 15, a 4 to 1 compression ratio will mean a pressure of 60 lb. per square inch. One atmosphere is already in the combustion chamber, and four atmospheres are required, therefore three must be in the cylinder before compression takes place. Hence the

compression space for a 4 to 1 compression equals  $\frac{c.c.}{3}$ , or in the case of a 500 c.c. engine—

$$x = \frac{500 + x}{4}$$

$$4x = 500 + x.$$

$$3x = 500.$$

$$x = \frac{500}{3} = 166.6.$$

This is, of course, a simple mechanical calculation, and takes no account of the heat engendered by compression, or that lost through the cylinder walls.—ED.]

### Diesel Engines for Motor Cycles.

Sir,—I was much interested to see a letter in last week's issue on the subject of Diesel engines for motor cycles. The fact of being able to do away with electrical ignition is not so important as are the possibilities of cheapness and controllability during ignition of the entire mixture. In most Diesel engines liquid fuel is driven in by compressed air, and there is a certain period available for gasification.

Even on large engines the amount of liquid fuel per stroke is very small, and therefore the only method of control is often to cut out one cylinder. Now on a motor cycle softness of control is of greater importance than fuel consumption, and this is one of the reasons why I suggested some years back that if the liquid were converted into a gas a large volume of controllable fuel would be obtained, admitting it on any system of forced induction to the engine. Paraffin and similar fuels, owing to the difficulty of complete vaporisation under varying temperatures and pressures, are exceedingly liable to give a dangerous deposit in the cylinder, but this is certainly no reason for not experimenting.

In my humble opinion the carburetter is one of the parts of a modern motor which is exceedingly far from finality, no matter for what purpose the engine be designed.

A. M. LOW, A.C.G.I., D.Sc., etc.



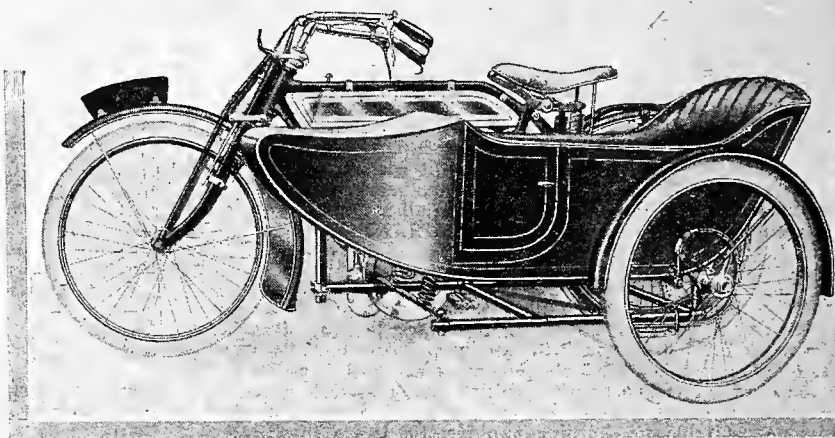
## A NEW COMET SIDECAR OUTFIT.

### ANOTHER LIGHTWEIGHT COMBINATION.

**T**HE lightweight sidecar outfit is undoubtedly gaining in popularity for light touring and town work.

This is probably due more to the low first cost and the small running expenses than anything else, and for this reason several firms are now making complete outfits specially constructed for this purpose. Mr. A. H. Haden, maker of the New Comet motor cycles, is now listing a little outfit of this kind. The engine fitted is a  $2\frac{3}{4}$  h.p. two-stroke Peco, which drives by chain and belt via a two-speed countershaft gear. The sidecar is the standard New Comet lightweight model, and is composed of a rectangular tubular chassis considerably underslung. Attachment to the cycle is at three points. The handsomely-shaped coachbuilt body is carried on C springs at the rear, while the foot is sprung on two coil springs. The general appearance of the little outfit is distinctly good.

Two other rather unusual sidecar chassis models are also manufactured by this firm, one being a special design suitable for the 4 h.p. Douglas, and intended for Overseas use. Four-point attachment is used, and it will be seen that the chassis, which is underslung, has double tubes on both sides, which adds greatly to the strength.

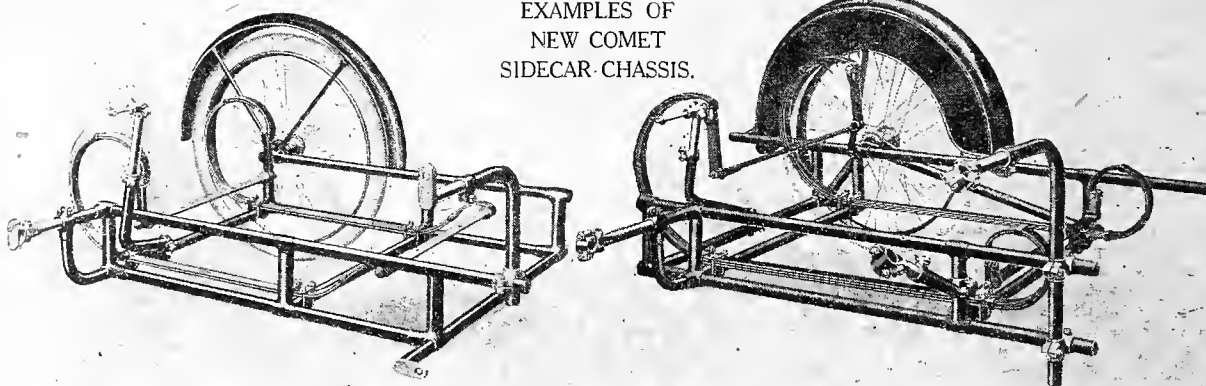


The New Comet lightweight sidecar outfit. The bicycle is fitted with a  $2\frac{3}{4}$  h.p. Peco engine and Albion countershaft two-speed gear.

The other model is intended for use with a double-seated body in connection with a high-powered twin. This chassis is somewhat similar to the one intended for the 4 h.p. Douglas, only the four points of attachment are rather different, being arranged in such a way that they are adjustable to suit any type of machine. It will also be noticed that all the main connections are attached to

the chassis at two points. The lower rail of the frame on the wheel side, instead of running parallel as in the other model, is carried up at an angle and assists in supporting the wheel axle. The chassis is thus triangulated on that side and should be extremely strong. The body is intended to be carried on C springs and shackles both front and back.

#### EXAMPLES OF NEW COMET SIDECAR CHASSIS.



(Left) Model designed for use with 4 h.p. Douglas machines, showing double side members of frame. (Right) New Comet chassis to carry two-seated bodies. Note how frame is triangulated to support wheel axle.

## THE GLASGOW M.C.C.

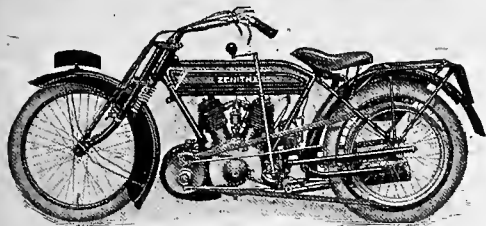
### TEMPORARY SUSPENSION OF THE CLUB'S ACTIVITIES.

**A** PROPOSAL that the club's activities be suspended for an indefinite period was carried *nem. con.* at the annual meeting of the Glasgow M.C.C. on Wednesday last week. The motion was submitted by Mr. John Gow, president of the club, on behalf of the committee, and a short *résumé* of the circumstances, supplemented by a few words from Mr. J. S. Fulton, convinced the meeting that there was no alternative. The club carried out a modified competitive programme last year with a fair amount of success, but since the end of the session

the membership has been still further depleted by the call to the Colours, and with the prospect of further enlistments in the near future it was felt by the committee that it would be unwise to attempt to "carry on," at least during 1916. The treasurer's financial statement showed the club to be in a sound position, and no subscriptions will be collected during the present year.

It was mentioned by the hon. secretary that 104 members had paid for 1915, which was considered satisfactory in view of the large number absent on military

duties. The retiring officials and committee were re-elected, to hold office until such time as they deem it advisable that the club's activities should be resumed. The office-bearers are: President, Mr. John Gow; vice-presidents, Messrs. J. S. Fulton, G. H. Cutbush, G. W. Orr, and the Rev. Dean M'Nairney; captain, A. R. Fraser; vice-captain, G. Wilson; hon. secretary, E. W. Thiem, Windsor Hotel, Glasgow; hon. treasurer, W. Muir, 20, Monteith Row, Glasgow; committee, Messrs. W. Hood, G. Thomson, J. L. Dykes, and F. Miller.



A "Clutch and Countershaft" type, with Kick Starter, Positive Locking Clutch, longest Belt Drive, and the Gradua Gear.

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The  
Motor Cycle  
that in peace time  
**MADE RINGS ROUND**  
all its opponents, in all  
classes of contest—speed,  
endurance, convenience,  
and so on—is still giving  
satisfaction in all forms  
of active service, in all  
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motor cycles are used.  
Is yours a  
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Catalogue with pleasure.

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**DIVIDED SKIRTS**

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FOR HYGIENIC AND SCIENTIFIC REASONS.

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its catching in the transmission or being burnt by the engine.  
Graceful and elegant and feminine while walking.

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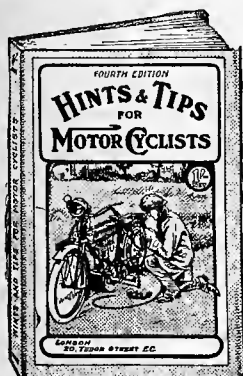
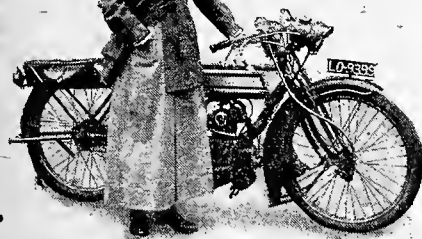
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## A Useful Little Pocket Companion.

Every motor cyclist should make use of this book. It is brimful of sound advice  
respecting the care, management, and repair of motor cycles. Every hint and tip is  
numbered, and reference is made very simple by a very exhaustive alphabetical index

**Fourth Edition, Revised and Enlarged.**

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In answering these advertisements it is desirable to mention "The Motor Cycle."

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## Motor Cycle Tyres

and experience *real* "tyre comfort." They are made on generous lines, and show an increase of 25% Air Capacity. Withal they are the most economical, because, after all, "the best is really the cheapest."

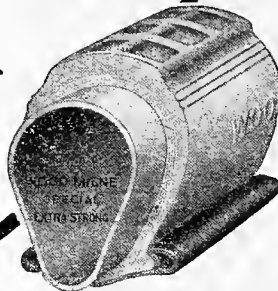
**Wood-Milne, Ltd., Preston.**

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**EMPIRE  
SIDE CARS**  
FOR ENDURANCE, RELIABILITY & COMFORT

HAVE PROVED THEIR SUPREMACY  
**ON ACTIVE SERVICE**  
WITH THE ALLIED ARMIES

REGD DESIGN

1916 MILITARY MODEL  
SUPPLIED TO H.M. WAR OFFICE  
FOR SERVICE AT THE FRONT.

WRITE FOR 1916 LIST TO  
**LOWES EMPIRE MOTOR & SIDECAR CO. LTD.**

EMPIRE HOUSE  
BIRMINGHAM

## THE RESTRICTED SUPPLY OF PAPER.

How readers of *The Motor Cycle* can assist in effecting the necessary economy.

IN view of the proposed restriction by the Government of the supply of paper, readers of "The Motor Cycle" can render valuable assistance to the Publishers by making a point of always purchasing their copy from the same place, or, better still, by giving a definite order to a newsagent for the regular supply of the journal each week. If this plan is adopted generally a considerable economy of paper will result, for newsagents will be better able to gauge their requirements, and will be left with fewer unsold copies, which are, of course, wasted.

*Kindly fill in this form, cut out and hand to your newsagent.*

### ORDER FORM.

To.....1916  
.....Newsagent.

Please \*deliver a copy of "The Motor Cycle" each week until countermanded.  
reserve

Name.....

Address.....

\*Cross out word not required.

# QUESTIONS & REPLIES

A selection of questions of general interest received from readers and the replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" on the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Armature Rubbing Field Magnets.

**?** Will you please tell me whether the efficiency of a magneto is seriously interfered with if the armature rubs very slightly against the field magnets?—M.M.

We do not think that the sparking efficiency would be greatly affected, but there is no doubt that the armature rubbing against the field magnets would eventually cause considerable damage to the machine in general, and the heat generated by the friction would probably destroy the insulation of the armature.

## Refusal to Start.

**?** My  $3\frac{1}{2}$  h.p. single-cylinder 1913 model has never been a machine which would start easily. When the engine is cold I have to run twenty yards or so before it fires, but if warm it fires in from four to six yards. Can you give me remedies for starting easier?—S.E.

To obtain easy starting, the chief thing is to have all adjustments correct. Make sure there are no air leaks between the carburetter and engine. Plug points should be clean and separate about  $\frac{1}{32}$  of an inch; the contact points should separate .4 mm., or, roughly, the thickness of a visiting card. Always start with the spark as far advanced as possible, as the magneto gives the hottest spark when in this position. Do not give too great a throttle opening—about one-third is sufficient—and close the air. A small amount of petrol injected through the compression tap will usually facilitate matters in cold weather.

## Valve Timing.

**?** I would be obliged if you would tell me the best timing for the valves of my  $3\frac{1}{2}$  h.p. single-cylinder.—D.E.

You will find the following valve setting to be about correct for all ordinary touring purposes. Make sure the exhaust valve closes when the piston is exactly at the top of its stroke. The inlet should then open immediately after, and close just after the piston has begun to rise. The design of the cam will automatically arrange that the exhaust valve will open at the correct moment, which, as a rule, will be found to be about  $\frac{1}{4}$  in. from the bottom of the firing stroke. We would recommend you to obtain a copy of "Motor Cycles and How to Manage Them" or "Tracing Troubles," price 1s. 4d. and 1s. 2d. respectively post free from these offices, in which you will undoubtedly find much information which will be of use to you.

## Naphtha as a Fuel.

**?** I run a 6 h.p. Enfield sidecar combination. Now that petrol is such a price, I should be obliged if you would tell me if naphtha used alone or a mixture of half petrol and half naphtha would do any damage to the engine. Would the carburetter, which is an Amac, have to be altered in any way? I know one or two motorists who are using a mixture of half paraffin and half petrol.—A.S.

The usual result of using any spirit or mixture other than petrol or benzole is the rapid fouling of the cylinder and piston, and frequently rapid wear of the cylinder and sometimes other bearings, owing to the impoverishing of the lubricating oil caused by only half vaporised fuel. Provided the carburetter is accurately adjusted, and ample heating of the vaporising chamber as well as the incoming air is provided, quite satisfactory results can be obtained from mixtures of about 50% petrol and paraffin. The same would apply to naphtha, though, we believe, the latter is rather more expensive. With a 50% mixture fairly easy starting can be obtained without injecting or first running on petrol, while the usual trouble of knocking when running on pure paraffin is considerably reduced. If

a greater proportion of paraffin is used very great difficulty in starting will be experienced, and trouble by knocking and very rapid fouling of the cylinder and piston will be prevalent.

## Magneto for Vertical Twin.

**?** Would you kindly tell me what the firing angle of a magneto should be for a twin-cylinder with vertical cylinders?—J.S.

For a vertical twin a magneto similar to that used on the Douglas, viz., one firing at  $180^\circ$ , is required, but the method of running it depends upon the crank setting. If both cranks go up and down together, the explosions are quite even, i.e., one explosion each revolution. It will, therefore, be necessary to run the magneto at half engine speed. If, however, the cranks are set at  $180^\circ$ , viz., one up and one down, the explosion will occur at uneven intervals, the two explosions taking place both in the same revolution of the crank, a long interval, occupying a complete revolution, taking place before the next two explosions. In this case it is necessary to run the same magneto at engine speed. This setting will ignite the mixture correctly, but two idle sparks will take place at the top of each exhaust stroke. This, however, will in no way affect the running.



AT A NEW ZEALAND TRAINING CENTRE.

A 6 h.p. Royal Enfield and sidecar at the Territorial Camp at Oamaru, North Island, where it has been used by its owner, Raleigh Ginsberg, in his despatch riding work.



### Loss of Power.



I have a 6 h.p. twin combination which until lately went well and carried three easily. About three months ago I had it taken down, since when I have used it very little. I now find it has lost power very considerably. I have cleaned the carburetter, and all other points seem to be all right. It knocks badly on hills now, and will not climb those that it used to take easily on top.—G.H.S.

It is possible that your loss of power is due to any of the following: The piston rings may be jammed in their grooves with carbon deposit and require freeing. Insufficient lubrication will also cause loss of power. Make sure your valves are seating properly and that the clearance between the tappets and valves is not too great—4 mm. would be about correct. The valve springs may have lost some of their original strength. Make sure the silencer is not choked and so causing back pressure and overheating. Also make quite sure the carburetter is thoroughly clean. We think if you attend to all these adjustments you should regain the lost power.

### Materials for Brazing.



I am anxious to build a motor cycle to my own ideas, so would be glad of the following particulars. (1.) Would one or two small blow lamps, such as are used for removing paint, be of any use for brazing? (2.) What materials do I require for brazing, and how is it done? (3.) What sort of fit has a tube to be in a lug before brazing? (4.) What heat should a tube be heated to before bending is attempted?—F.M.

(1.) No. You require a large paraffin brazing lamp, or a gas blow pipe specially made for the purpose. (2.) To make a satisfactory job of brazing much practice is needed. Great care has to be taken not to get the metal too hot and so burn it and weaken the joint. At the same time sufficient heat to cause the brass to run thoroughly must be applied. The materials needed are either a gas blow pipe or a paraffin brazing lamp; a forge with asbestos cubes, in order to concentrate the heat in the required place; a supply of brass wire or spelter, and a brazing flux such as Boron composition—borax is also used. The parts to be brazed are thoroughly cleaned, and, if necessary, pinned in position, then placed in the forge, and the asbestos cubes packed all around the points to be joined. The heat is then applied, and when the parts have obtained a red heat some of the flux should be applied with a brass wire. It will then be found that directly a sufficient heat has been attained the brass wire will melt and run around the joint. While the parts are still red hot the joint may be brushed with a wire brush to

## THE MOTOR CYCLE

### ANNUAL SPRING NUMBER

WILL APPEAR ON  
**Thursday, April 13th.**

remove any undesirable brass. This will save much time in filing after the article has cooled down. (3.) It should be a good tight fit, and also pinned before brazing. (4.) To bend a tube without a proper tube bending machine, it should be filled with sand, and the two ends plugged with wooden plugs, and then heated at the point where the bend is required to a red heat, taking care that it is heated evenly all round. Care should be taken that the tube is not heated to a greater heat than is absolutely necessary, otherwise it may be burned, and the strength greatly impaired.

### Two-stroke and Passenger Work.



I am thinking of purchasing this season a 2½ h.p. two-stroke and sidecar, but before finally deciding I would like your opinion as to whether the machine will have power enough to take my wife and myself up any ordinary gradient, such as one meets on the usual roads. I do not intend any freak hill-climbing. I may say I only weigh just on eight stone; my wife weighs, if anything, a trifle less. If the load is all right, would it be ill-using the machine to take occasionally a passenger on the carrier? The engine I propose is a 2½ h.p. two-stroke Peco, 75 mm. x 79 mm. bore and stroke.—M.B.

If fitted with a two-speed gear there is no reason why you should not take a light sidecar on main roads quite satisfactorily with the engine you mention. The usual objection with passenger light-weights is that the frame is not sufficiently strong to withstand the extra side strain. We would not advise you to carry a third passenger on the carrier. There are several machines of this power now on the market intended for light sidecar work.

### Shortening Magneto Chain.



Will adjusting the magneto chain by removing the half link upset the magneto timing?—A.S.

If the magneto chain is so long that it is possible to remove half a link, it would be advisable to do so, but care will have to be taken not to alter the magneto timing. Provided the half link is taken from the non-driving side of the chain, no alteration to the timing will

take place. Before removing the link you should carefully mark the positions of both the magneto and the engine, and when replacing the chain be sure to put it in exactly the same position. If, however, there is only a small amount of slack you will probably find that this can be taken up by simply moving the position of the magneto. After making the adjustments it would probably be as well to check the timing, as if the chain has stretched so much as to require a half link taking out, this may have become somewhat retarded. With the ignition lever two-thirds retarded the spark should occur when the piston is on the top dead centre.

### EXPERIENCES WANTED.

Readers desirous of obtaining the experience of others with various motor cycles or accessories must enclose a stamped addressed envelope in which the replies may be forwarded. Answers to the queries should be addressed c/o The Editor.

“L.N.P.” (Edgbaston).—2½ h.p. Allon two-stroke. Reliability, speed, hill-climbing, consumption, and sidecar capabilities.

“F.J.S.” (Devon).—Binks carburetter and spirit. Power, consumption with sidecar, effect on engine, and general efficiency.

### RECOMMENDED ROUTES.

TRURO TO NEWBURY.—F.M.

Truro, Ladock, Bodmin, Launceston, Okehampton, Exeter, Honiton, Chard, Wincanton, Amesbury, Andover, Newbury.

MANCHESTER TO SWINDON.—T.F.C.

Manchester, Altrincham, Northwich, Crabbtree Green, Tarporley, Whitechurch, Wellington, Bridgnorth, Kidderminster, Worcester, Tewkesbury, Cheltenham, Collesbourne, Cirencester, Cricklade, Swindon.

CHICHESTER TO PRESTON.—H.S.

Chichester, Petersfield, Alton, Basingstoke, Newbury, East Isley, Wantage, Faringdon, Fairford, Cirencester, Cheltenham, Tewkesbury, Severn-Stoke, Worcester, Hartlebury, Kidderminster, Bridgnorth, Stockton, Wellington, Crudgington, Hodnet, Whitechurch, Tarporley, Cuddington, Stretton, Warrington, Hulme, Newton-le-Willows, Ashton-in-Makerfield, Wigan, Standish, Preston.

ASHFORD TO MANCHESTER.—H.S.V.S.

Ashford, Maidstone, Wrotham Heath, Meopham, Gravesend, by ferry to Tilbury, then through Brentwood, Ongar, Harlow, Hertford, Watton, Stevenage, Bedford, Higham Ferrers, Kettering, Market Harborough, Leicester, Derby, Ashbourne, Leek, Macclesfield, Adlington, Handforth, Manchester.

### PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

In view of the decision of the Government to limit the import of material for the manufacture of paper it is imperative that every possible step should be taken to avoid waste of paper in any form. It has been the custom in the past for newsagents to order a certain number of papers for chance sales, and these copies if unsold become what are known as “returns”; in other words, waste copies.

In the case of “THE MOTOR CYCLE” the percentage of returned unsold copies has been remarkably low, but in order to conserve the supply of paper in future it is desirable that the waste of copies, ordered to accommodate occasional purchasers, shall as far as possible be eliminated.

Readers of “THE MOTOR CYCLE” are urgently requested to assist in this matter by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

# Will your tyres Stand much of this?



## The answer !

Granby Villas, Bingham, Notts.

Dear Sirs,—I think it only fair to say that your Special Heavy Cover is marvellous. I have been running one on my driving wheel for thirteen months and have ridden considerably over 6,000 miles. I use my machine practically every day, fair weather or foul, winter and summer, and as much of the riding is at night over roads that are not steam-rolled, and generally covered with loose stones, I consider that your tyre has emerged triumphantly from a most severe test.

You are welcome to use this letter as you may wish.

Yours truly (signed), F. P. GENT.

# Bates

SUPER RUBBER.

# Tyres

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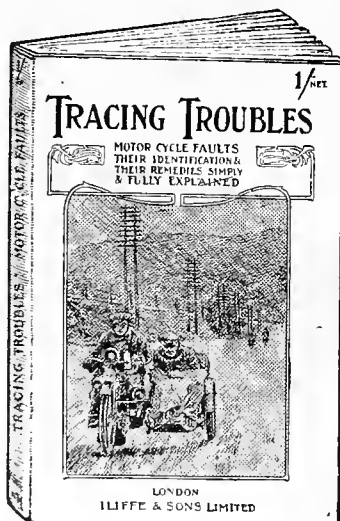
Smith, Denham & Co., Henderson's Buildings, Von Brandis Street Johannesburg, South Africa. Childs, Parr, and Joseph, Nairobi, British East Africa. David F. Laing, 9, Weld Road, Kuala Lumpur, F.M.S. Cycle and Motor Supplies, Ltd., Farish Street, Wellington, New Zealand. Cornell, Ltd., 122, 124, Pirie Street, and 29, 31, 33, Hyde Street, Adelaide, South Australia. A. G. Healing & Co., Ltd., 354-356, Post Office Place West, Melbourne, Australia. Bennett and Barkell, Castlereagh Street, Sydney, Australia.

In answering this advertisement it is desirable to mention "The Motor Cycle."

# TRACING TROUBLES

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Revised and brought up to date.



**MOTOR CYCLE FAULTS,  
THEIR IDENTIFICATION  
AND THEIR REMEDIES  
SIMPLY AND FULLY  
.. .. EXPLAINED .. ..**

**T**HIS handy little volume deals with all the faults to which motor cycles are liable, explains how they can be easily diagnosed, and shows how they can be rectified. Every conceivable cause of trouble is dealt with, and the remedy for it carefully explained. It is written in simple language by a practical motor cyclist of long experience, and fully indexed for ease of reference.

- ¶ The Third Edition of this handy book for motor cyclists is now on sale.
- ¶ All obsolete matter has been taken out, and new matter added to bring it up to date.
- ¶ The Section dealing with Two-stroke Motor Cycles has been considerably enlarged and rearranged.
- ¶ A new section dealing with Electric Lighting Dynamos has been added.

Price 1/- net. By post 1/2.

FROM

**Iliffe & Sons Ltd., 20, Tudor Street, London, E.C.**

and all leading booksellers and bookstalls.

(Remittance should accompany orders sent by post).

## AMONG THE ACCESSORIES.

### A Useful Helmet for the Rainy Season.

A GOOD form of head-dress for wet weather has been placed on the market by Messrs. the Service Co., Ltd., 289-293, High Holborn, W.C. It

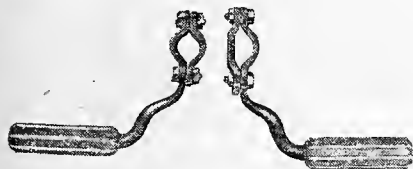


The Service Co.'s oilskin helmet.

is composed of thin oilskin, and is lined with woollen material. Ear holes with the necessary flaps are provided. Motor cyclists will much appreciate a helmet of this kind when cold winds and heavy rains are prevalent.

### Footrests and Handle-bar Grips.

MOTOR cyclists who favour pillion riding know how uncomfortable it is not to have anywhere to place the feet. To get over this difficulty Messrs. Brown Bros. have introduced special footrests to be attached to the



Brown Bros. footrests.

chain stays of a motor bicycle, which are suitable to be fitted to either round or D shape tubes. This considerably adds to the comfort of those who ride on the back carrier of a motor bicycle.

To obviate the occasional vibration which is perceptible on the handle-bars



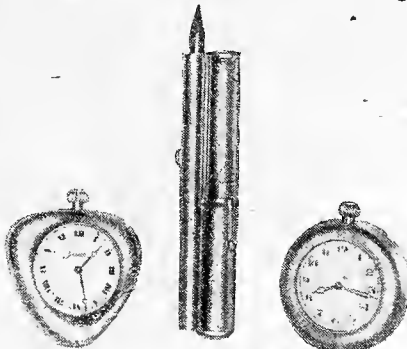
Rubber handle grips to absorb vibration.

of a machine, this firm also specialises in rubber handle-bar grips built up on steel casing. These are extremely pleasant to hold, and certainly absorb a considerable amount of either.

### Three Useful Accessories.

A FIRM which is not as yet well known to the motor cyclist, but is devoting special attention to his needs, is that of Messrs. Etienne et Cie., who have placed on the market two very useful motor cycle watches in watch cases of British manufacture. Of these, one is heart-shaped, and is of attractive pattern, while the other, which is round, is provided with a luminous dial.

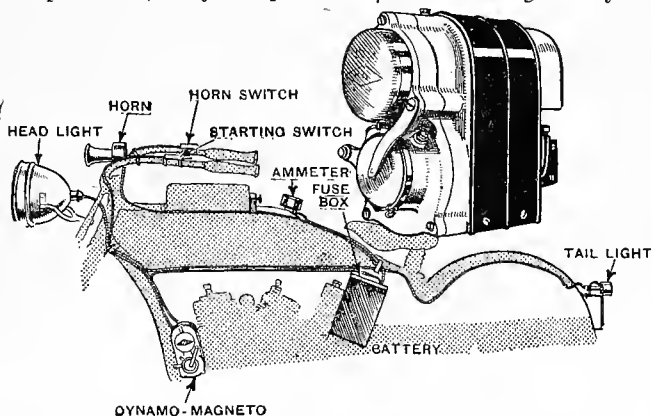
Yet another useful accessory sold by this firm is an electric pencil. When the pencil is pushed upwards the light is switched on, and is directed on to the paper on which the owner is writing.



Two watches and an illuminated pencil—two useful accessories for the motor cyclist sold by Etienne et Cie.

### The Splitdorf Dynamo Magneto.

THE Splitdorf dynamo-magneto has become known in connection with the Indian motor cycle. The machine contains two armatures; the upper one, used for lighting purposes, runs at engine speed, the sparking armature at half engine speed as usual. As the magnets are not permanent, they have to be excited by current from the battery, which is passed through the shunt coils of the dynamo by revolving the machine a few times with the kick starter; this causes a small contact, controlled by a centrifugal governor, to be brought into action. At a speed of about 30 m.p.h. (1,400 r.p.m.) the generator produces a current of 3 amps.  $7\frac{1}{2}$  volts, and a suitable fuse is contained in the circuit. Should the battery become discharged the lamps can be lighted direct from the generator, when running at moderate speeds. The set comprises a 6 c.p. head light, a 2 c.p. tail, and an electric horn.



Motor cycle equipped with the Splitdorf dynamo-magneto igniting and lighting set. The instrument itself is shown enlarged resting on the saddle.

### A Pair of Footrests and an Exhaust Whistle.

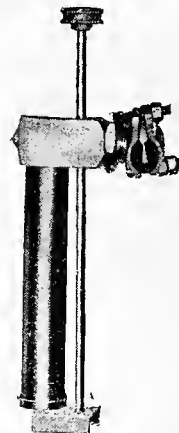
RIDERS of old pattern machines are often anxious to improve them by the addition of footrests, and for



Footrests marketed by J. Grose, Ltd.

this purpose Messrs. James Grose have placed on the market a useful set of rubber-covered footrests, which are sold at a very moderate figure.

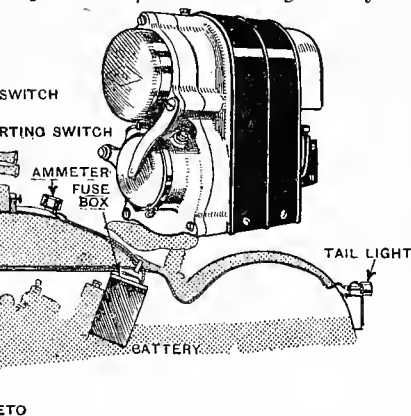
Another of their specialities is a very well-made exhaust whistle, known as the Throstle. One of its chief attributes is the fact that it is practically self-cleaning, the valve employed being a type of slide, the opening of which keeps the most important parts free from carbon deposit.



Grose's exhaust whistle.

### The Spitler Puncture Plug.

A NEAT and handy metal puncture-sealing stud is the Spitler puncture plug, sold in England by Messrs. Watts and Co., of West Ealing. This stud consists of three parts, viz., a disc with a screw, a recessed cap which fits over the screw disc, and a lock-nut. The screw disc is inserted through the puncture, which should be slightly enlarged if necessary. The cap is then placed on top and the whole locked together by the



lock-nut, which is tightened by a special key. It is claimed that the stud makes an absolutely permanent repair. There is no doubt that this method of repairing would be a great boon in the wet or on a dark night.

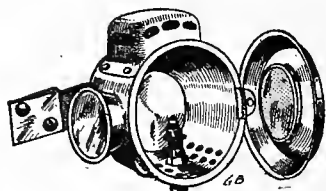


### Tyre Deliveries.

The Palmer Tyre, Ltd., inform us that it has now a stock of the 3in. cord tyre in the three-rib, combination, and steel-studded patterns for private users. Previously some delay was caused through military claims, but the company is now able to keep pace with those requirements.

### Benevolent Fund Handbook.

We have received from Mr. A. J. Wilson a copy of the 1916 handbook of the Cycle and Motor Trades' Benevolent Fund. The good work done through the agency of this fund in a quiet and unobtrusive manner is well-known throughout the motor and cycle trade, and a glance at this new handbook impresses one with the strength and activity of those responsible for the direction of the fund's activities.



A well made tail lamp sold by H. Taylor and Company, Limited, of Store Street, Tottenham Court Road.

### A Useful Booklet.

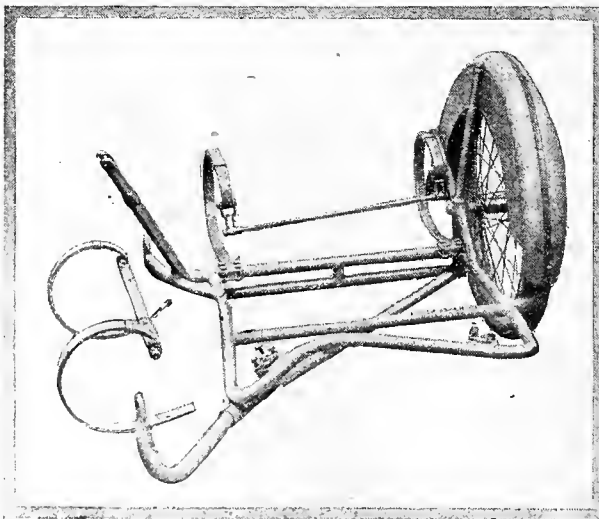
We have received from the Enfield Cycle Co., of Redditch, "The Book of the 3 h.p. Royal Enfield," fourth edition. This contains full instructions for running the machine named, a complete list of parts with prices, including those of magneto and carburetter, and many useful hints and tips. A copy will be sent to any rider of the 3 h.p. Enfield on application.

### Motor Cycle Trade with Russia.

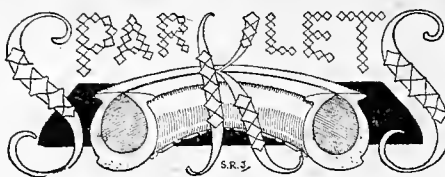
The Russo-British Trade Exchange, Ltd., 16, Regent Street, S.W., a society for the promotion of trade between Great Britain and our Russian Allies, informs us that it is at all times willing to give British manufacturers of motor cycles and accessories information concerning Russian commerce, regulations, and tariffs.

### The Result of a Serious Collision.

The sidcar chassis shown was constructed by Messrs. Robertsons Motors, Ltd., and was attached to a Harley-Davidson motor bicycle. As will be seen, it has had to withstand a pretty severe impact. Thanks to the joints being made on the acetylene welding process, these are absolutely intact and uncracked, whereas if brazed joints had been used far more serious damage would have been done.

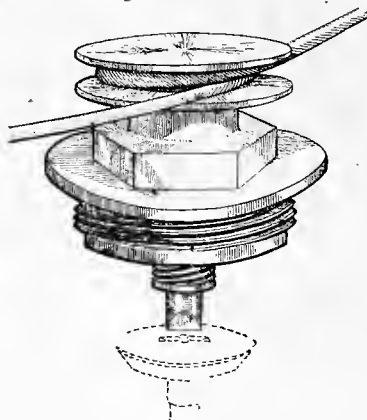


A Robertson sidcar chassis after a serious collision, showing what a small amount of damage was done owing to the welded joints.



### A Novel Valve Grinder.

The makers of the Ariel motor cycle have introduced a new type of valve grinder which is made suitable for use with both the 3½ h.p. single and 5 h.p. twin Ariel engines. The valve cap is



removed, the grinder takes its place, and the valve is rotated through the top of the grinder by means of a piece of stout twine or thin cord.

### Catalogues Received.

James Grose, Ltd., 4, Old Jewry, E.C. An extensive catalogue of motor cycle accessories of all kinds and types.

New Imperial motor cycles. In this publication there is contained much information concerning the New Imperial light tourist motor cycle. New Imperial Cycles, Limited, Princip Street, Birmingham.

### Treasury Note Cases.

The makers of Pedley tyres are making a special offer to purchasers of Pedley belts or motor cycle tyres during the last two weeks of March. The inducement consists of a neat morocco leather Treasury note case, which is presented free to every purchaser of the goods stated.

We are also informed by Messrs. J. Pedley and Son, Ltd., that they have now taken over the whole of the premises situated at 30, Holywell Lane, Great Eastern Street, E.C., which they lately held in conjunction with another concern.

### Reviews.

"Indian Motor Cycles, 1916." A publication worthy of the well-known Hendee firm. The illustration depicting a part sectional model of the Powerplus engine is particularly worthy of mention. The same also applies to the sectional picture of the two-stroke. The Hendee Manufacturing Co., Ltd., 366-368, Euston Road, N.W.

"Penzance and the Land's End District." (The Homeland Association, Ltd., 37-38, Maiden Lane, Covent Garden, W.C. 6d.) This is a useful guide book, written by a number of authors interested in the locality, each specialising on the subject on which he writes. The account of the antiquities, in which West Cornwall is particularly rich, is in every sense adequately dealt with, while the book also contains an excellent map of West Cornwall and a plan of the town of Penzance.

"Clubs, 1916." E. C. Austen Leigh. (Spottiswoode and Co., New Street Square, E.C. 5s. 4d. post free.) A list of over 4,000 clubs frequented by Englishmen in all parts of the world. Over 1,500 golf clubs are included. The information, we notice, is not always up to date or accurate; for example, the A.C.U. has no secretary according to this list, while neither the R.A.C. nor A.A. and M.U. has any object in life. In addition, the R.A.C. subscriptions mentioned are out of date.

The Kempshall 700×85 mm. non-skid cover, which is designed to fit 650×65 rims. The anti-skid Kempshall cover is slightly different in design, as will be gathered from an illustration published in our issue of February 17th.



"Complete Hints and Tips for Automobilists." (Iliffe and Sons Ltd., 20, Tudor Street, E.C. 2s. 6d.) A new edition of this useful book has lately been published. It consists chiefly of a reprint of the most valuable hints and tips which have appeared in *The Autocar*—a feature which has been very popular since it was first introduced in 1902. The new edition has been very fully revised and brought thoroughly up to date. Notwithstanding this fact, hints and tips which are likely to be of use to owners of out-of-date cars are still retained. A fresh feature is the section devoted to dynamos, accumulators, and electric lighting outfits generally for the motor car.

The **ONLY BELT** for Gradual Gears.



THE  
"ZILLA" BELT  
LEATHER & RUBBER.

**UNBREAKABLE:** Because the whole pulling strain is taken by a steel chain core, manufactured to withstand from 3 to 4 times the pulling strain of any motor cycle yet built.

**NON-SLIPPING:** Because the leather and rubber washers on the chain have 50% greater driving surfaces than leather or rubber belts, and the combination of leather and rubber will grip the driving pulley in any weather.

**FASTER DRIVE:** Because the washer and chain construction gives a flexibility which allows the Zilla Belt to "hug" the smallest pulley without that great internal friction and force required to bend an ordinary belt round it.

**JUST THE THING FOR SIDECAR WORK,** especially in changeable weather or in exposed positions.

## SPECIAL OFFER

7/8"	1"	1 1/8"	1 1/4"	
28/-	30/-	34/-	36/-	USUAL PRICE for 8ft.

22/-	23/-	24/-	25/-	SPECIAL PRICE
				for any length up to 8ft.

The "ZILLA" is the **ONLY PERFECT Belt**.  
Get a "ZILLA" and end all your Belt troubles.

To avoid delay, send P.O. or cheque to-day to:

The **ZILLA PATENT BELT COMPANY, Ltd.**,  
101, Great Western Street, MANCHESTER.

## SPECIAL LODGE RACING PLUG.



**C** The most successful plug yet produced for standing up to the hottest of racing engines without causing pre-ignitions.

Not recommended for low-compression or oily engines.

Price

**7/6**

each.

THE LODGE SPARKING PLUG CO., LTD.,  
BIRMINGHAM and RUGBY.

## Stewart MOTOR CYCLE SPEEDOMETER



## AN ESSENTIAL EQUIPMENT.

Consider the great risks you run in riding without a reliable speedometer, consider the numerous advantages of having a perfect speed and mileage indicator on your motor cycle, and then—give an order for a "Stewart," the best speedometer that money can buy.

You'll save its cost in next to no time, in fines saved and economies effected, while as to the pleasure it will give, that is a benefit which cannot be measured in money. Absolutely accurate, needle steady as the hands of a watch, and it registers from Zero to 75 miles per hour.

**Motor Cycle  
Model : : 63/-**

*From Traders and from*

The Cooper-Stewart Engineering Co., Ltd.,  
11, Broad Street, Bloomsbury, London, W.C.

(Stewart Warning Signal, 25/-)

# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**A.J.S., 1916.**—All models in stock, or for early delivery.—Moss, Wem. [X4806]

**A.J.S., 1916, 6h.p.,** actually in stock.—Crow Bros., 190, High St., Guildford. [X2514]

**JULIANS** Broad St., Reading. 'Phone: 1024.—Immediate delivery of all A.J.S. models. [X2833]

**SHREWSBURY** Agent for A.J.S.: 2½h.p., 4h.p., and 6h.p. models in stock.—J. C. Pickering. [X3443]

**A.J.S., 1914, 2½h.p.,** 3-speed countershaft gear, clutch and kick starter; exceptional bargain, £28.—Below. [X4748]

**A.J.S., 1916, 4h.p. twin,** in stock for immediate delivery; £76.—Elice and Co., 15-16, Bishopsgate Ave., Camomile St., E.C. [X551]

**A.J.S. 6h.p. Combination,** fine condition, new Sept., 1915; £478.—Box 201, c/o The Motor Cycle. [X4849]

**A.J.S. 5h.p. Combination,** perfect, wind screen, Cape hood, speedometer, lamp; photo; £50.—Scully, Morrison. [X4748]

**A.J.S. 1913 6h.p. Combination,** 3-speed, all accessories, perfect order; £47.—E., 16, Welldon Crescent, Harrow, Middlesex. [X4664]

**A.J.S. 4h.p.,** and sidecar, 1916 model, just delivered, £93/17; also 1917 2½h.p. model, £58.—Turpin, 22 and 29, Preston Rd., Brighton. [X716]

## Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone: 766.

Telegrams: "Perfection."

### NEW 1916 MODELS.

LEVIS, 2½ h.p., 2-stroke .....	£32 0
SUNBEAM, 3½ h.p., 3-speed .....	£73 10
SUNBEAM, 8 h.p., 3-speed, twin .....	90 gns.
EXCELSIOR (American), 7 h.p., 3 speeds ..	£75 0
CALTHORPE Minor, 2 seater .....	185 gns.
MORGAN, de luxe, and accessories .....	£117 18
NEW IMPERIAL, 2½ h.p., 2 speed .....	£36 15
NEW IMPERIAL, 2½ h.p., variable magneto ..	£37 18
DOUGLAS Models.—Orders booked now.	

### (U.S.A.) EXCELSIOR,

1916, 7 h.p., 3-speed model, 84×89, countershaft gear, chain drive, mechanical and hand lubrication, high-tension magneto, multiple-disc clutch with dual control, kick starter, 2 gallons petrol capacity; £75. Exchanges quoted. Easy Payments arranged. Sole Yorkshire distributors. Trade supplied.

### NEW 1915 MODELS.

*CONNAUGHT, 2½ h.p., 2-speed .....	£41 16
*WOLF-J.A.P., 2½ h.p., 2-speed .....	£38 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke ..	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed ....	£39 10
*ROYAL RUBY, 6 h.p., 3-speed .....	£87 0
U.S.A. EXCELSIOR, 7 h.p., dyn. lighting, etc.	£71 10
*Cash offers wanted.	

### PERFECTION SIDECARS

to suit American Excelsior and Harley-Davidson machines, 28×3 Dunlop tyre, grey coach-built body and chassis .....

£13 10

### SOLO MACHINES.

1915 4½ h.p. 2-speed LINCOLN-ELK, as new	£38 10
1913 3½ h.p. ROVER, 3-speed .....	£37 10
1913 3½ h.p. ROVER, Grado gear .....	£27 10
1912 3½ h.p. 2-speed TORPEDO .....	£19 10
1912 3½ h.p., 2-speed, F.E. BRADBURY .....	£27 10
1912 3½ h.p. 2-sp. BRADBURY, chain drive ..	£29 10
1912 3½ h.p. 2-speed F.E. PREMIER .....	£27 10
EXCELSIOR, 3½ h.p., 3-speed, Druid forks ..	£19 10
2½ h.p. 2-speed DOUGLAS .....	£24 10
KERRY, 3 h.p., magneto, Saxon forks .....	£12 10
5½ h.p. magneto REX, spring forks .....	£12 10
N.S.U., twin, 2-speed, spring forks .....	£15 10
TRIUMPH, 3 h.p., magneto, new tyres .....	£18 10
NEW IMPERIAL, 2½ h.p., 2 speeds .....	£25 10
REX, 3½ h.p., magneto, Grado gear .....	£8 15
P. & M., 3½ h.p., 2-speed, chain drive .....	£27 10

### £145 RITZ LIGHT CAR. £145

The last word in light car values; 10 h.p., 4-cylinder, mechanical lubrication, electric horn and lighting, hood, screen, tools; luxuriously sprung, and a grand top gear car. Deliveries from stock. Trial runs by appointment. Exchange liberally catered for.

### SIDECAR COMBINATIONS.

Brand new 6 h.p. REX Sidetite .....	£69 10
1914 3½ h.p. 3-speed ARNO and Sidecar ....	£36 10
1914 6 h.p. REX Sidetite, almost as new ..	£53 10
W.C. WILLIAMSON and Sidecar (new) .....	£89 15
1913 7-h.p. QUADRANT and Sidecar .....	£49 10
1913 3½ h.p. 2-speed PREMIER and Sidecar ..	£33 10
1910 3½ h.p. 2-speed REX and Sidecar .....	£24 10
6 h.p. 3-speed PEUGEOT and Sidecar .....	£22 10
3½ h.p. 2-speed P. & M. and Sidecar .....	£19 10
REX, 5½ h.p., 2-speed, and Sidecar .....	£22 10

### MISCELLANEOUS.

New 8 h.p. W.C. WILLIAMSON Cy-cl. ca. ..	£126 0
MORGAN, 1914, hood, screen, lamps, speedometer, overhauled and repainted, like new ..	£79 10
RENO 15 h.p., 4-cylinder Touring Car .....	£65 0
PREMIER 7-h.p. 2-seater Light Car .....	£67 10
1916 12 h.p. New Type OVERLAND .....	£220 0
New 1916 5-seater OVERLAND .....	£75 0
New Mechanical Horns .....	17/6
New Acetylene Tail Lamp, post free .....	1/4
At Mudscreen, cost 2/-, take .....	10/6

WANTED—Second-hand Douglas, for cash.

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the production of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**A.J.S. 1915 6h.p. Combination,** spare wheel, speedometer, Lucas lamps, Long horn, spare chains, etc., practically new; £85, lowest.—Almond, Stationer, West Bromwich. [X4752]

**2½h.p. A.J.S.,** 3-speed, kick-starter, very fast engine, semi-T.T. bars, slightly used, 1915 model; £48 (forty-eight pounds).—H. J. Marston, 50, Argyle St., Birkenhead. [X2423]

**A.J.S. 1915, 4h.p.,** with cane Watsonian sidecar, P.M. lamp, Low generator, Lucas Cylind. Cowey, all good condition; £58.—Smith, Sideley, Kimberley Rd., Leicester. [X4332]

**A.J.S., 1915, 2½h.p.,** 3-speed, P. and H. lamp, little used, like new, owner doctor foreign service; £50.—Machine can be seen Officers' Mess, Military Hospital, Bramshott. [X2416]

**1915 4½h.p. A.J.S.,** 2-speed, owner joined up; 1913 4½h.p. A.J.S. and Millford sidecar; 1913 2½h.p. A.J.S., 2-speed; all thoroughly overhauled.—Hussey, Vine St., Stafford. [X2504]

**LATE 1912 6h.p. A.J.S.,** countershaft gear, chain drive, kick starter, new tyres, complete with £13/15 Canoelet sidecar, splendid condition; any trial, sacrifice £38.—Elice, Dimple, Matlock. [X4758]

**A.J.S., 1914, 6h.p.,** 3 speeds, speedometer, head lamp, side and rear lamps, horn, and 24 in. Gloria sidecar; £75.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X4715]

**A.J.S. 6h.p. Combination,** new April, 1915, wind screen, lamp, horn, and tools, condition excellent, mileage under 5,000, tyres good; £85 (eighty-five pounds).—H. J. Marston, 50, Argyle St., Birkenhead. [X2422]

**A.J.S., 1912, 6h.p.,** 2-speed countershaft gear, chain drive, head lamp, horn, and rear lamp, and Gloria coachbuilt sidecar; £50.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X4714]

**A.J.S. 6h.p. Combination,** with hood, screen, £106/18/6; also 4h.p. solo, £76; delivered carriage paid, crate free, for cash orders; special quotation for short term payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X2324]

### Alldays.

**SHREWSBURY** Agent for Allons: all models in stock.—J. C. Pickering. [X3444]

**1915 Allon, done 200,** as new; £28; easy payments arranged.—Jones, Garage, Muswell Hill, N. [X2237]

**ALLON, 1916, 2½h.p.,** 2-speed, very little used, owner at Front, £35.—Jacob, 39, Lewin Crescent, E.C. [X2541]

**1915 2½h.p. Alldays—Matchless,** lamps, etc.; £22, or nearest offer.—Brigshaw, 135, High St., Strood Kent. [X2286]

**3½h.p. Allday, Roe 2-speed gear,** complete, tools, and accessories, just overhauled; £20.—Tilley Motors, Ledbury. [X4651]

**ALLDAYS—Allon,** all models; immediate delivery easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [X7676]

**BRAND New Allon Motor Cycles,** never used, just delivered, all latest improvements; lowest price £43.—C. Binks, Eccles. [X2491]

**1916 Allon 2-stroke,** 2-speed, done 50, as new £37, or exchange 5h.p. twin, Indian preferred.—C. Pritchett, 141, Merton Rd., Wimbledon. [X2451]

# ROAD CRAFT

Your enquiries  
will be welcomed.

## IN STOCK.

B.S.A., Model H	£64 0
HARLEY-DAVIDSON, 11F, brand new	£68 5
2½ h.p. A.J.S., sporting model	£58 0
4½ h.p. JAMES, 3-speed, and Sidecar	£80 10
7 h.p. INDIAN (Powerplus) and Sidecar	£101 10
3½ h.p. T.T. ROVER, Philipson pulley	£56 0
2½ h.p. A.J.S., Model B	£58 0
T.T. IXION, T.T.	£52 10
JAMES, 2-speed	£28 10
Lady's METRO, 2-speed	£38 10
HOBBART, 2-speed	£38 10
SPARKBROOK, 2-speed	£40 0
EXCELSIOR, single-gear	£30 18
OMEGA, 2 speed, 3 h.p.	£39 18
OMEGA, single-gear	£31 10
OMEGA, 2½ h.p. J.A.P., 2-speed	£39 18
Lady's IXION, 2-speed	£36 0

## SECOND-HAND MACHINES OVERHAULED.

1914 2½ h.p. PRECISION, T.T., with Enfield 2-speed	£27 10
1915 IVY, 2-stroke, practically new	£22 0
1914 4 h.p. 3-sp. TRIUMPH, only done 2,000 miles	£48 0
T.T. BRADBURY, 4 h.p., complete, fine order	£28 0
1914 3½ h.p. HUMBER, 3-speed, coach- built Sidecar, Lucas lamps, etc. A bargain	£40 0
1913 3½ h.p. TRIUMPH, 3-speed, coach- built Sidecar	£48 0
1913 6 h.p. 3-speed A.J.S. and coach- built Sidecar, lamps, etc.	£60 0
1910 3½ h.p. TRIUMPH, fine condition	£22 0
1911 TRIUMPH, just renovated	£25 0
1910 2½ h.p. ENFIELD, twin, mag., etc.	£13 10

## NEW & SECOND-HAND SIDECARS IN STOCK.

Mills-Fulford "Skiff," finished in black, complete with apron and mat, delivery from stock	£13 18
Burbury Wicker, canoe front, side door	£7 7
Burbury Coach-built, grey	£13 13
Burbury Coach-built, green	£13 13
Burbury slipper Coach-built, sporting model	£10 10
Burbury, Cane	£13 13
Light Wicker Sidecar, fits Triumph	£3 0
Art Cane Sidecar, fits Triumph	£2 10
Art Cane, practically new	£5 0
Coach-built, room for child in front, practically new	£6 0

## REARLIGHTS.

We stock the T.W.R. Aluminium Rearlights,  
price 7/6, and can supply per return.

One No. 7 REMINGTON Typewriter,  
in splendid order ..... 25

**WE STOCK  
AND  
RECOMMEND  
PEDLEY  
BELTS**

**The North Wales  
Motor Exchange,  
HOLT STREET, WREXHAM.**

Telephone: 283.  
Telegrams: "Motor Exchange, Wrexham."

## MOTOR CYCLES FOR SALE.

Douglas.

DOUGLASES.—Model V and War Office from stock;  
special quotations for short term payments.  
Lamb's, 151, High St., Walthamstow, and 50, High Rd.,  
Wood Green. [2322]

DOUGLAS, late 1914, 2-speed, and clutch, T.T.  
bars, fine condition, very fast; £38, or exchange  
5h.p. twin, Indian preferred.—C. Pritchett, 141, Mer-  
ton Rd., Wimbledon. [2455]

DOUGLAS, 2½h.p., 2 speeds, clutch, footboards, speed-  
ometer, just overhauled, mechanically perfect, new  
back tyre, tube, belt, and chain sprockets; £22/10.—  
Fendley, Castleknock, Lockerbie. [X4776]

DOUGLAS, 1916, T.T., brand new, in stock: £1 1914  
T.T., in nice order, £34, a 4h.p. combination disc  
wheels, practically new, the smartest in London.—Percy  
and Co., 337, Euston Rd., London. [2401]

DOUGLAS.—Immediate delivery models U. V. W.  
Book your orders now from the sole agent for  
Anglesey and Carnarvonshire. Tel.: No. 5.—Jones,  
Anglesey Motor Mart, Llanfairpwll. [X9486]

DOUGLAS, 1915, 2½h.p., T.T., 2-speed gear, all-  
black War Office model, 2½ tyres, Senspray, car-  
burettor, accessories; £42/10.—Elce and Co., 15-16,  
Bishopsgate Ave., Camomile St., E.C. [0479]

1915 Douglas, 3-speed gear, Spartan horn, absolutely  
perfect condition; to be cleared at 42 guineas, ex-  
changes, easy terms.—Julians, Broad St., Reading.  
Biggest motor cycle and light car dealers in the South.  
45 years' reputation. 'Phone: 1024. [X4812]

1914 Douglas, 2½h.p., 2-speed, specially enamelled  
red to order, footboards, 3 g.o. lamp set,  
Stewart speedometer, horn, knee grips, spares, and  
tools, exceptional military mount, condition perfect;  
£36/10.—Collett, Outfitter, Daventry. [X4832]

DOUGLAS Model H, 2 speeds, free, Lucas lamp and  
generator, speedometer, mirror, X'all saddle, new  
Palmer and Pedley, footboards, re-enamelled, plating  
good, very easy starting, suit beginner; £28, or near.—  
Seen 9 till 6 p.m., or appointment, at 10, Eagle Court,  
Clerkenwell, E.C. [2277]

Empire.

3½h.p. Empire, Precision engine, 1913, U.H. en-  
gine, closed mag., Sturmer-Archer 3-speed, and  
clutch, perfect condition; £25, or nearest.—Ginn,  
Carlton, Carlisle. [2407]

Enfield.

ENFIELD 2½h.p. Twin; £12.—Garage, Larkhill Camp.  
[1980]

JULIANS, Broad St., Reading. 'Phone: 1024.—  
Immediate delivery of all Enfield models. [X2835]

ENFIELD 1915 6h.p. Combination; a bargain, 265.  
—Wilkins, Simpson, and Co., 11, Hammersmith  
Rd., London. [2298]

ENFIELD Combination, 1913½ 6h.p. twin, fine en-  
gine, accessories; £50, offers.—3, Ashville, A.V.,  
Scarborough. [X4778]

ENFIELDS, 6h.p., 3h.p., electric Model de Luxe,  
in stock.—Newton's, Manchester sole agents, 5,  
Blackfriars St. [X2715]

1916 Enfield Combination, complete, not ridden 100  
miles; bargain, £82.—Hammond, 42, St. Phillips  
Rd., Newmarket. [2294]

ENFIELD, late 1915, 3h.p. twin, 2-speed, Miller lamp,  
done under 1,000; seen by appointment; £40.—  
Strong, Magor, Mon. [2369]

OFFICER'S Enfield 6h.p. Combination, new October,  
many accessories, splendid condition, not run 600;  
£75.—Box 1957, c/o The Motor Cycle. [2306]

ENFIELD, 2½h.p., 1913½, 2-speed, free, drip feed,  
perfect condition, all accessories; bargain, £25.—  
J. Hooper, 15, Uxbridge Rd., Hanwell, W. [2291]

ROYAL Enfield, 1915, 3h.p., 2 speeds, and kick  
starter; £38.—Eastern Garage Co., 418, Romford  
Rd., Forest Gate, E. 'Phone: East Ham 490. [X4717]

1912 6h.p. Enfield, special wide coachbuilt sidecar to  
seat 2, accessories, etc.; £45, cash or easy terms.  
—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff.  
[0722]

1916 3h.p. Enfield, 2-speed, new 2 weeks ago, and  
only used 3 times; great bargain, £42/10; owner  
at Front.—Alexander's, 115, Lothian Rd., Edinburgh.  
[1932]

2½h.p. Enfield, 1913, 2 speeds, clutch, all-chain  
drive, all accessories, excellent condition, over-  
hauled; nearest £27/10.—84, Spring Bank, Hull.  
[2411]

ROYAL Enfield, 1914, 2½h.p., 2-speed, twin, kick  
start, chain drive, speedometer and watch, splen-  
did condition; £33.—A.C., 4, Camrose St., Plumstead,  
S.E. [X4693]

ENFIELD Late 1913 6h.p. Combination, 2-speed, in  
first-class condition, speedometer, lamps, spring  
luggage grid; £48.—77, Parliament Hill, Hampstead  
(after 5). [2375]

ENFIELDS actually in stock for immediate de-  
livery, combinations, 3h.p., and 2½h.p. models,  
ready to drive away.—P. J. Evans, John Bright St.,  
Birmingham. [2450]

ENFIELD, the all-British combination.—We have  
them in stock, and are proud of it. £89/5 is the  
price, and it's the best thing at that figure, or any other  
for a matter of that. Exchanges quoted. If you prefer  
the Yankee article, see our advertisement under Excelsior  
(American).—Laytons' Garage, Bicester, Oxon.  
[X4892]

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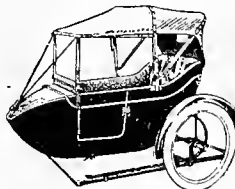
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## Enfield.

ROYAL Enfield 1914 6h.p. Combination, coachbuilt, speedometer, lamps, horn, etc.: £55.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X4724]

ENFIELD 1914 6h.p. Combination, wind screen, speedometer, lamps, horn, mirror, etc., an exceptionally fine conditioned outfit: £62.—S. 54a, Redcliffe Sq., Earl's Court. [X4861]

NEW 1916 Enfield 6h.p. Combination, Lucas, electric lighting; cost £105 this month; driven 20 miles; for sale cheap to best offer.—Thompson, Potato Merchant, 30, Orford St., Ipswich. [2426]

1913 Enfield Combination, 2 lamps, horn, speedometer, first-class condition throughout, numerous spares, overalls, new cover; trial: £48.—Particulars from Sparshatt, Grammar School, Ludlow. [X4822]

ENFIELD, 1915½, 2-speed, 3h.p. model, lamps, horn, Stewart speedometer, mirror, footkit, Beacon oilskin jacket and Penrith seated overalls; first cheque £45.—Box 199, c/o The Motor Cycle. [X4852]

ENFIELDS.—All models delivered from stock; cash orders carriage paid, crato free; special quotations for short term payments. Also 1914 6h.p. combination, special price £60; and 1915 ditto, £69/10; both complete with accessories.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2321]

ROYAL Enfield New Combination, 6h.p. and 8h.p., chain driven machines, fitted with handsome coachbuilt sidecar, countershaft gear and free engine, up-to-date, complete with storm apron; 85 gns.; tuition free, and free delivery to any address within 50 miles of London; best terms for cash, exchange, or extended payments.—Wauchope's, 9, Shoe Lane, London. [X4867]

## Excelsior.

BRITISH Excelsior, 3½h.p., clutch model, 1912, splendid condition, new tyres; bargain, £20.—Newham, 223, Hammersmith Rd., W. [2447]

1915 American Excelsior, 7h.p., 3-speed, as new, only used 200 miles; £55.—Alexander's, 115, Lothian Rd., Edinburgh. [1934]

EXCELSIOR (American).—Why pay £75 or more for a ——— when we offer you its genuine equal, that is American opinion at any rate, with 3-speed countershaft gear, at the special price of £60 new? He that hesitates is lost. Serve him right, too.—Laytons' Garage, Bicester, Oxon. [X4893]

## F.N.

1911 2½h.p. F.N., 2-speed, free engine; £15.—Apply. Poxon and Co., Canterbury. [2275]

F.N., 5-6h.p., 4-cyl., 2 speeds, F.E.; any trial: £20.—Avondale, Napier Rd., Wembley. [2376]

F.N., 2½h.p., 3 speeds, Armstrong; sacrifice 11 gns.—Percy and Co., 337, Euston Rd., London. [2399]

F.N., 5-6h.p., 2 speeds, sidecar, mileage 1,200, splendid order; £20, or exchange single-cyl.—46, Marmon Rd., Clapham Common, S.W. [2304]

## Grandex.

GRANDEX, 4h.p. J.A.P., free engine, Multiple pulley, slightly soiled; £37/10.—Colmore Depot, 31, Colmore Row, Birmingham. [X4659]

GRANDEX-PRECISION, 1916, 2-stroke, 2½h.p., quite new; listed £34, for £31: fine model.—Grandex, 86, Gray's Inn Rd., W.C. [1705]

GRANDEX-PRECISION Motor Cycle, 2-speed, F.E., mag., B. and B., only run 500 miles, new January, 1916, guaranteed in running order; £34, carriage paid to United Kingdom.—Apply to J. Monteath, St. Boswell's Roxburghshire. [2303]

## Harley-Davidson.

FOR Harley-Davidsons, see below.

HARLEY-DAVIDSON, model F; £68/5.—The Premier Motor Co. [X4796]

MODEL J, with dynamo lighting outfit; £76/15.—The Premier Motor Co., Aston Rd., Birmingham. [X4796]

YOU Save over £12 by purchasing direct from The Premier Motor Co., Aston Rd., Birmingham. [X4796]

SIDECARS for Harley-Davidsons. We save you money. Immediate delivery.—The Premier Motor Co., Aston Rd., Birmingham. [2530]

1916 Harley-Davidsons; all models in stock.—Parker and Son, St. Ives, Hunts. [2473]

SHROPSHIRE Agent for Harley-Davidsons; 1916 models, delivery from stock.—J. O. Pickering. [X3448]

HARLEY-DAVIDSON Models in stock, complete with Gloria sidecar.—Turpins, 22 and 29, Preston Rd., Brighton. [0713]

HARLEY-DAVIDSON, 1915, 8-9h.p., model 11J, 3-speed, electric lighting set and horn, equal to new; £65.—Jominy, Jewry St., Winchester. [2313]

1915½ Harley-Davidson, electrically equipped, Gloria sidecar, mileage 2,000, perfect; any trial: £78.—Howes, 42, Vauxhall Bridge Rd., S.W. [2429]

1915½ Harley-Davidson, 11J, 3-speed, dynamo lighting, done 50 miles, unscratched; £70; consider light-weight part.—77, Hammersmith Rd., Kensington. [2316]



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HARLEY-DAVIDSON, slightly soiled, 11J Model, with special Millford Empress sidecar; cost £100, £76/13; guaranteed perfect.—Colmore Depot, 31, Colmore Row, Birmingham. [X4657]

HARLEY-DAVIDSON 1915 Model 11F, and Mills-Fulford Empress sidecar to match, best lamps, Stewart signal, combination used 500 miles; £75; any trial.—Deane, Matlock Bath, Derbyshire. [X4796]

HARLEY-DAVIDSON, 7-9h.p., June, 1914, small mileage, good condition, trial solicited, owner on service, Lucas lighting, horn, Klaxon, coachbuilt sidecar; £52/10.—Roy, Ludgershall, Andover. [2437]

HARLEY-DAVIDSON, 1915 electric model, and Empress sidecar, £60, special cut price; special quotation for short-term payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2331]

LATE 1915 Electrically Equipped Harley-Davidson, Millford sidecar, hood, screen, parts, tyre, overalls, waterproof boots, cap, goggles, etc., all splendid condition; owner called up; only needs seeing; £80, or near offer.—Williams, 9a, Stratford Rd., Kensington. [2279]

FOR Best Terms and earliest delivery, place your order with the firm who introduced the Silent Grey in the Midlands. We offer the model F 7-9h.p. Harley Davidson 3-speed at £68/5, or the model J with dynamo electric lighting equipment £76/13; delivery same day that order is received. Carriage paid to any address. Tuition free if required. Get in touch with us now and save money.—The Premier Motor Co., Aston Rd., Birmingham. [2077]

## Henderson.

1915 4-cyl. Henderson, brand new, with 20 gns. sidecar, shop-soiled only; £82.—Alexander's, 272, Gt. Western Rd., Glasgow. [193]

IMMEDIATE Delivery from stock of the new 8-11 h.p. 4-cyl. Henderson, the all-weather motor cycle 82 gns.; exchanges arranged; trial run and tuition free.—The Premier Motor Co., Aston Rd., Birmingham. [253]

## Hobart.

HOBART, 1914, 2-stroke, good condition, accessories £15/10, or nearest; must sell.—Stewart, 106, Gai Lane, Lichfield. [X487]

## Humber.

1915 3½h.p. Humber, 3-speed, new condition; £40.—Apply, Poxon and Co., Canterbury. [226]

£8/10.—3½h.p. Humber and sidecar, U.H. mag seen running; must sell immediately.—Speckley, 45, Church Rd., Acton. [X487]

3½h.p. Humber, with Roe gear, thoroughly overhauled, lamp, generator, horn, large toolbag; £25.—Seen at 248, Bishopsgate, London. [247]

HUMBER, 3½h.p., 1913, 3-speed Sturmer-Arche Jones speedometer, lamp, tools, sidecar, not doi 5,000; £38.—F. Wheat, 59, Albert Rd., South Norwood S.E. [221]

HUMBER, 3½h.p., 2-speed, and 14 gns. sidecar, excellent condition throughout, complete with accessories; £35.—Green, Kingsley House, Paddock Wood. [241]

HUMBER Twin, 2½h.p., 1913, just been re-bushed re-enamelled, etc., guaranteed first-class condition; £20.—Firth, 27, Woodbridge Rd., Moseley, Birmingham. [X310]

HUMBER, 1914, 3½h.p., 3-speed, and Canoelet sidecar, head lamp, rear lamp and horn; £45.—Eastern Garage Co., 418, Romford Rd., Forest Gate. Phone: East Ham 490. [X4796]

## Indian.

INDIAN, 1916, new 5h.p. model, actually in stock. Moss, Wem. [X487]

1914 T.T. Indian, 5-6h.p., clutch £25, offers.—Ban Full St., Derby. [X47]

1914½ T.T. Clutch Indian, 75 m.p.h., new condition, 62, Park Av., Barrow-in-Furness. [X47]

SHREWSBURY Agent for Indians: all models in stock, or early delivery.—J. C. Pickering. [X34]

JULIANS' Broad St., Reading. Phone: 1024 Immediate delivery of all Indian models. [X28]

5h.p. 3-speed Indian, as new, and Bramble sidecar match; £70.—Parker and Son, St. Ives, Hunts. [24]

INDIAN, 1912, 7-9h.p., 2-speed, coach, cane sidecar lot perfect; £30.—Giffen, Southwold Rd., W. ford. [24]

1915 Indian, 5h.p., very little used, and in first class condition; £52.—Seen at 248, Bishopsgate, London. [24]

INDIAN, 1914, T.T., 7-9h.p., clutch model, special racing engine, very fast; 39 gns.—K. Bushey, Hampton Wick. [24]

1914 7-9h.p. Indian Combination, 2-speed, hood, electric lighting, etc., as new; £56.—289a, Bridge Rd., Leyton. [24]

1916 Indian, brand new, 5h.p., countershaft 3-speed and free engine £70, or near offer.—Gibbs, Crombe End, Radstock, Som. [24]

INDIAN, 1916, Power Plus, Model G, unscratched demonstration machine.—Particulars, J. J. O'nam, Braxington, Wiltshire. [X48]

INDIAN, 1915, 5h.p., 3 speeds, De Luxe sidecar; £40.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X4796]

## MOTOR CYCLES FOR SALE.

## Indian.

INDIAN, 1914, for sale, belonging to officer gone abroad, good condition, 7-9h.p.; price £43.—Apply 12, York Terrace, Regent's Park, N.W. [2264]

1915 7h.p. 3-speed Indian, clutch, kick starter, necessary spares, Gloria Projectile 30 gn. sidecar, good condition; £75.—Dr. Fraser, Attleborough. [X4789]

1915 Indian 7-9h.p. combination, mileage 1,600, condition as new, all accessories; £70, or 1915 B.S.A. in part exchange.—384a, Wells Rd., Bristol. [X4333]

INDIAN, 1915, 5h.p., 3-speed, electric head and tail, speedometer, horn, not done 1,000 miles, as new; £47.—Wolverson, Horseley Fields, Wolverhampton. [X4661]

INDIAN Road Racer, 4h.p., 2-speed, and clutch, lamp, accessories, etc., very fast; any trial; £34, or exchange lightweight.—C.S., 497, Old Ford Rd., Bow. [X4788]

1913 Indian (Red), 7-9h.p., 2 speeds, and 18 gn. Gloria sidecar, lamps, tools, spares, Low generator, splendid condition, just re-painted; £45.—J. W. Duncann, Llandaff. [X4842]

INDIAN, late 1914, 7-9h.p., combination, Millford sidecar, 2-speed, clutch, kick starter, electric equipment, speedometer, good condition; £48/10, lowest.—Martinez, Nestlea, King's Rd., Newbury. [X4801]

INDIAN, 1915, 3-speed coachbuilt sidecar, £55; a 1914, 2-speeds, 7-9h.p., and coachbuilt sidecar, electric equipment, hood and screen, speedometer, £45.—Percy and Co., 337, Euston Rd., London. [2397]

INDIAN 1915 3½h.p. Twin 3-speed Motor Cycle and sidecar, mileage 1,000, lamps, horn, speedometer, tools, spares, and accessories, complete; £56.—Apply, Mongonui, Cleave Houses, Northam, Devon. [2315]

INDIAN, 1915, 5h.p., 3 speeds, and clutch, semi T.T. bars, India light coach sidecar, accessories, complete, absolutely as new; exceptional bargain, £52.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

INDIAN, 1914½, 7-9h.p., electrically equipped, speedometer, tools, spares, coachbuilt Millford sidecar, hood, screen, upholstered removable child's seat, indisputable from new; £60; seen any time.—70, Coombe Lane, Wimbledon. [X4775]

INDIANS.—All models delivered from stock, with sidecars to suit; cash orders carriage paid, crate free; special quotation for short term payments. Also 1914 nearly new 7-9h.p., spring frame, electric starter model, £51.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2328]

INDIANS in Stock.—Latest models, Power Plus combinations, sporting Power Plus 3 speed models, standard 7h.p. overhead inlet combinations, with lighting set, the famous 5h.p. 3-speed double-purpose mount and 7-9h.p. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [2451]

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IXTOR, standard model in stock, immediate.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1995]

## James.

JAMES, 2-stroke, in stock.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X4911]

SHREWSBURY Agent for James; early delivery all 1916 models.—J. C. Pickering. [X3450]

JAMES, 1915, 2½h.p., 2-stroke, 2-speed, lightweight, in splendid order; £30.—Below.

JAMES 1915 Combination, done about 500 miles, 4½ h.p., 3-speed countershaft gear, clutch and kick starter, coach sidecar, Lucas horn, head and tail lamps, guaranteed sound; £58.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

3-SPEED 4½h.p. James Combination; 32 gns. or separate.—Troward, Heathurst, Vale of Health, Hampstead. [2340]

LATE 1914 4½h.p. James with coachbuilt sidecar, run 100 miles, equals new, all accessories; £50.—R. E. Jones (Garages), Ltd., Swansea. [0784]

1915 James, 4½h.p., with James Canoelet coachbuilt sidecar, complete, nearly new; price 62 gns., or exchange for solo mount.—Newham, 223, Hammersmith Rd., W. [2446]

1h.p. James, 2-speed, with special Canoelet sidecar, speedometer, horn, head light, side lamp, apron, and spares, only done 2,580 miles, in splendid condition; £50.—Milne, James Grove, Kirkcaldy. [X4875]

1h.p. James Combination, Montgomery sidecar, with luggage and can holder, wind screen, 700x80 over back wheel, lamps, and horn; the whole in new condition; any inspection; £48.—Harvey Hudson and Co., South Woodford, N.E. [X4690]

JAMES 1916 Combination delivered from stock; cash orders carriage paid, crate free; special quotations for short term payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. Also 1915 ½h.p. 3-speed twin, ridden 700 miles, at cut figure of £43. [2332]

## J.A.P.

1h.p. J.A.P., Druids, B. and B., Bosch, Brooks, 228/10.—Whitehead, Braunstone Gate, Leicester. [X4870]

J.A.P., 1914, 4h.p., T.T. bars, O.H. valves just thoroughly overhauled, exceptional sports appearance, 70 m.p.h. guaranteed; £30.—Ahl, 22nd Reserve Liverpool Regiment, Prescott. [X4843]

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1914 6 h.p. A.J.S. Com., 750 c.c. engine	70 0	25 0	80/8
1914 6 h.p. A.J.S. Com., hood and screen	75 0	25 0	89/7
1913 7 h.p. INDIAN and Sidecar	50 0	15 0	62/8
1914 8 h.p. ZENITH, c/shaft, and Sidecar	62 0	18 0	78/10
1915 5-6h.p. EXCELSIOR Combination; cost £86	77 10	27 10	89/7
Mod. J 7-9h.p. HARLEY-DAVIDSON, electric equipment, new; cost £86 13s.	76 13	26 13	89/7
1913 3½h.p. ARIEL, 3-sp. and Sidecar	40 0	10 0	53/9
1914 2½h.p. LEVIS, 2-sp. and Sidecar	32 10	10 0	40/4
1913 Lady's DOUGLAS, 2-speed	39 0	—	—
1914 3½h.p. SUNBEAM, 3-speed	46 10	—	—
1914 4-5 h.p. ZENITH, 1915 AUTO-WHEEL, single-speed	13 13	3 3	18/4
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J.A.P. and Sidecar, 6h.p., £32, perfect, all spares, new Duolet heavy rubber-studded cover, 26x2¼, 24; new Dunlop 1in. belt, 8ft., 12/6; six new best plugs, 12/-—Mason, 46, Miller St., Drottwich. [2354]

4 h.p. J.A.P., Bosch waterproof mag., 1914 B. and B. semi-automatic carburetter, adjustable pulley, tyres and belt fitted last year, horn, lamp, and generator, everything in sound condition; bargain, £25, or nearest.—5, Shrubbery St., Kidderminster. [2526]

## J.E.S.

J.E.S., in B.S.A. cycle, Dunlops, grand machine; 11 gns.—Young, Public Baths, Tooting. [2501]

J.E.S., 1916 model, 1½h.p. engine, brand new machine; usual price £25, take £20.—W. W. chope's, 9, Shoe Lane, London. [X4863]

## J.H.

J.H. Motor Cycles, latest models, in stock.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1988]

1915 J.H., 2½h.p., 2-stroke, Villiers engine, excellent condition, fully equipped, tyres and belt as new; £18.—Lawson, Dispatch Rider, Crystal Palace. [X4726]

## Juno.

JUNO, new 2½h.p. Villiers 2-stroke, semi-automatic lubrication, all latest improvements; £29/10, 41/8 month.—See below.

JUNO-V.T.S., 2½h.p., 2-stroke, second-hand, late model, very little used; price £24.—See below.

JUNO-J.A.P., 6h.p., Sturmer-Archer countershaft gear, semi-automatic lubrication, heavy 2½in. Dunlops, Druid forks, aluminium footboards, and all latest improvements, brand new; price £75/12. Catalogue for full particulars post free. All the above ready for immediate delivery.—Seen at Metropolitan Machinists Co., Ltd., Showrooms, 248, Bishopsgate, London. [2483]

## Levis.

1915 Levis Popular, good as new; £25.—Parker and Soc, St. Ives, Hunts. [2475]

LEVIS Popular, 1914 model, perfect order; £17.—4, Balfour Rd., Ilford, Essex. [2300]

JULIANS Broad St., Reading. Phone: 1024.—Immediate delivery of all Levis models. [X2637]

1916 Levis Popular, as new; £25.—Harris, 1, Paradise St., Rotherhithe. Phone: Hop 1555. [2434]

LEVIS Baby Model, 1914; bargain, £17/10.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [1998]

LEVIS 1916 Popular Models, £32; immediate delivery; exchanges.—D. J. Shepherd and Co., Enfield Highway. [2290]

LEVIS Popular, or new model E; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0764]

LEVIS, 2½h.p., 2-speed, new March, 1915, also spare tyre, good going order; offers.—Box 1946, c/o The Motor Cycle. [2261]

1915 Levis's Popular and model E, 2-speed, chain drive models, delivery from stock.—Wilkin, Hunter's Bar, Sheffield. [2470]

1915 Levis, 2½h.p., 2-speed Enfield gear, chain drive, spring frame, cost £54; bargain, £32.—Wilkin, Hunter's Bar, Sheffield. [2469]

LEVIS 1914 Model de Luxe, 2-speed, excellent running order, all accessories; £26.—M. C. Corder, The Brewery, Romford, Essex. [X3566]

LEVIS, 1914, 2½h.p., footboards, sight feed lubrication, mag. control, fully equipped; offers over £21.—Box 1381, c/o The Motor Cycle. [8497]

LEVIS Popular, 1915, semi-T.T. bars, fine condition throughout, fully equipped; first cheque £20 secure.—Box 1790, c/o The Motor Cycle. [1583]

LEVIS Popular, 1913, splendid condition, Bosch variable mag., Amec carburetter, all accessories included; only £16/10.—Norfolk Villa, Joseph's Rd., Guildford. [2508]

LEVIS 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. Phone: 1432 Regent. [0711]

LEVIS, 2½h.p., special T.T. frame, Enfield 2-speed gear, clutch, chain and belt, complete with lamps, horn, tools, coachbuilt sidecar attached.—Ager, Frederick Rd., Stechford, Birmingham. [X4695]

LEVIS, 1915, 2½h.p., Model de Luxe, 2-speed, counter-shaft, lamp, horn, etc., in splendid order; £34.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [1915]

A FEW 1915 Levis models going cheap, also 1914 De Luxe 2-speed at cut price of £27; special quotation for short term payment.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2327]

LEVIS Popular, 1916 models. We can deliver promptly at £32 cash, or by deferred payments; we have also in stock the standard Popular model at £28/1.—Oxfordshire Agents, Laytons' Garage, Banstead, Oxon. [X4894]

LEVIS 1916 Popular Model £32, and No. 1 with Enfield gear, Roman runs, £47/10; cash orders carriage paid, crate free; special quotations for short term payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2326]

## MOTOR CYCLES FOR SALE.

## Levis.

1915 Levis Popular, with footboards, perfect in every possible respect and unsurpassed, absolutely indistinguishable from new; 24 gns.; exchanges, easy terms.—Julians, Broad St., Reading. Biggest motor cycle and light car dealers in the South. 45 years' reputation. 'Phone: 1024. [X4809]

## Lincoln-Elk.

LATE 1915 4½ h.p. Lincoln Elk. 2-speed countershaft, Bosch, B. and B., ridden 300 miles, as new; accept £32, or nearest.—Brook, 88, Balgate, Lincoln. [X4819]

LATEST 1915½ 2-speed Lincoln-Elk, 4½ h.p., coach-built Canoelet sidecar and spares; bargain, £45, cost £60; trial arranged.—Hardy, Melbourne Cottage, North Mimms, Herts. [X4701]

1914 Lincoln-Elk, with 1915 4½ h.p. single-cyl. J.A.P. engine, countershaft, 2-speed, kick starter, nearly new tyres, coachbuilt sidecar, whole enamelled fawn; £46, or exchange Zenith.—55, High St., Hampton Wick. [X4609]

## L.M.C.

L.M.C., 3½ h.p., 2-speed countershaft gear, kick start and clutch, absolutely new, fully guaranteed; £45.—Colmore Depot, 31, Colmore Row, Birmingham. [X4655]

1912 4 h.p. L.M.C. wicker sidecar, 2-speed Roc gear, spare tube, valves, accessories, engine thoroughly overhauled last January by makers, perfect condition, whole enamelled grey, cost of overhaul £15, new apron; £28 cash.—Clayton, 116, Halifax Old Rd., Huddersfield. [X4747]

## Martin.

MARTIN, 6 h.p., brand new, cost £56, single geared; take £35.—65a, Rosendale Rd., Dulwich. [X4883]

MARTIN-J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear £37/10.—Sole London and District Agents Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.C. Tel.; Regent 1432. [X760]

## Matchless

8 h.p. T.T. Matchless-Jap Combination, overhead valves, very fast machine, and perfect; £35.—82, Caledonian Rd., N. [X4265]

1913 7 h.p. Matchless, Canoelet sidecar, all accessories; £55, cash or easy terms.—R. E. Jones (Garage), Ltd., Swansea, London, Cardiff. [X721]

MATCHLESS, 1914, 4 h.p. twin, 3 speeds, and Gloria sidecar; £50.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X4710]

MATCHLESS, 1913, 8 h.p., 2-speed, free engine, kick starter, Swan de Luxe sidecar, speedometer, Lucas lamps, sound mechanical order; £42/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X552]

1915 Matchless 8 h.p. M.A.G. Engine Combination, 3-speed gear, chain drive, Lucas lamps, speedometer, wind and Klaxon mechanical horns, condition perfect; accept £78; seen by appointment.—D.O., 235, Essex Rd., N. [X500]

## Mead.

1914 23½ h.p. Mead-Precision, engine good order; £20.—Apply, Poxon and Co., Canterbury. [X273]

## Minerva.

MINERVA Motor Cycle, 3½ h.p., good tyres, good condition, £6/10; one Rex engine, 3 h.p., nearly new, 35/—J. Thompson, 10, Napier St., Bury. [X4836]

## Moto-Reve.

MOTO-REVE, mag., new carburettor, wants belt; £6/10.—Butlin, 116, Fortress Rd., Keatish Town. [X4782]

## Motosacoche.

1913½ Motosacoche, 3½ h.p. twin, Enfield 2-speed; £23.—William Gossip, Knowsley, Inverness. [X4930]

1915 3½ h.p. Twin Motosacoche, 2-speed, air-cooled exhaust valves, with coachbuilt sidecar, brand new, shop-soled only; £56.—Alexander's, 115, Lothian Rd., Edinburgh. [X935]

## New Hudson.

NEW Hudson, 1915, 2-stroke, 2 speeds, lamps, horn, like new; £27, or near.—Lloyd, 108, Emmanuel Rd., Balham, S.W. [X415]

3½ h.p. New Hudson, 3-speed, and free engine, lamp, 32 horn, etc., perfect running order; £32.—Griffin, Coombe End, Radstock, Som. [X254]

BIG Six New Hudson Coachbuilt Combination, 3-speed countershaft drive, mileage 4,000; 56 gns.—Troward, Heathurst, Vale of Health, Hampstead. [X243]

NEW Hudson, 3½ h.p., 3-speed gear, handle start, and sidecar, exceptional lot; £40; guaranteed.—Colmore Depot, 31, Colmore Row, Birmingham. [X4658]

NEW Hudson, 1915, 2½ h.p., 2-stroke, magnificent condition; 19 gns.; cheapest New Hudson in England to-day.—Julian, Broad St., Reading. 'Phone: 1024. [X3024]

NEW Hudson, 1915, 6 h.p., 3-speed countershaft gear, coachbuilt sidecar, complete with lamp and horn, in excellent condition, and had very little use; £75.—Boumy, Jewry St., Winchester. [X2314]

NEW Hudson, 1915, 2-stroke, as new, semi T.T., footboards, Best and Lloyd, Miller head, horn, rear light, very low, very little used; £25/10.—Garner, 36, Cambridge St., Wolverton, Bucks. [X4851]

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We can supply any available new or second-hand motor cycle on payment of a small deposit and the balance in 12 monthly payments.

DELIVERY OF THE FOLLOWING 1916 MODELS FROM STOCK IMMEDIATELY, and upon the following advantageous terms:

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We also have in stock NEW IMPERIAL, B.S.A., IVY, INDIAN, ZENITH, A.J.S., SUN, NORTON, etc., which can be purchased on similar terms.

A liberal allowance can be made on your present machine and taken as a deposit.

Your enquiry will be esteemed and receive our immediate and careful attention.

### LIGHT CARS FOR IMMEDIATE DELIVERY.

10 h.p. ENFIELD Coupé, dynamo lighting £255

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10 h.p. ENFIELD 1915 Special 3-seater, dynamo lighting, almost new ..... £210

FORD 1915 2-seater, little used ..... £100

EXTENDED PAYMENTS can be arranged,

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## MOTOR CYCLES FOR SALE.

## New Imperial.

NEW Imperial-Jap, 1916 models in stock, from £36/15.—Crow Bros., Guildford. [X1878]

JULIANS' Broad St., Reading. 'Phone: 1024.—Immediate delivery of all New Imperial models. [X2838]

NEW Imperial, light tourist, immediate delivery; cash or easy terms.—Referee Cycle Co., 332, High Holborn. [X765]

1915 New Imperial-Jap, T.T., 2 speeds, long exhaust, very fast, splendid order; £24.—436, Whitehorse Rd., Thornton Heath. [X251]

NEW Imperials, latest models in stock; 2-speed, also kick-starter hand-controlled clutch models.—P. J. Evans, John Bright St., Birmingham. [X2453]

1916 Imperial-Jap, 2½ h.p., 2 speeds, ridden 78 miles, absolutely as new, lamps, horn, tools; cost £40/10, what offers?—King, 20, Bridge St., Cambridge. [X4921]

NEW Imperial, 2½ h.p. J.A.P., Albion countershaft 2-speed gear, late 1915 model, lamp, generator, horn; price £26.—Seen at 248, Bishopsgate, London. [X2484]

NEW Imperials, 1916 models, in stock; sole London agents: trade supplied; few 1915 shop-soled at reduced prices.—A. P. Rey, 173, Gt. Portland St., London, W. [X7832]

IMPERIAL J.A.P., 1915½, 2½ h.p., countershaft 2-speed, semi-T.T. bars, tyres as new; £29; must be sold this week.—Brendan, Beechwood Av., Thornton Heath. [X789]

NEW Imperial-Jap, 1915, 2½ h.p., 2-speed, P. and H. lamp and generator, rear lamp, horn, condition like new, extras; £30.—35, Gowlett Rd., East Dulwich, S.E. [X2447]

1915 New Imperial-Jap, 2½ h.p., 2-speed, variable ignition, in magnificent condition, new horn, etc. very great bargain, 25 gns.; also 1915 New Imperial No. 2 model, with 2-speed gear, clutch, and kick start to be cleared at 30 gns.; exchanges, easy terms.—Julians Broad St., Reading. Biggest motor cycle and light car dealers in the South. 45 years' reputation. 'Phone 1024. [X4811]

## Norton.

NORTON 1916 Big 4 h.p. Combination and T.T. Countershaft Model for early delivery.—Mos Wem. [X486]

NORTON, T.T., October, 1916, with lamps, horn, etc. good condition; £45, or offer.—Box L966, c/o The Motor Cycle. [X236]

1913 3½ h.p. 3-speed Norton, in excellent running order; £29; easy payments arranged.—Jones Garage, Muswell Hill, N. [X224]

NORTONS in Stock.—Latest Big 4 combination, T.T. and Brooklands road special.—P. J. Evans, John Bright St., Birmingham. [X245]

NORTON, 1914, 3½ h.p., T.T. model, very fast and reliable sole mount, guaranteed sound; £30.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X48]

1916 Norton, T.T. model, Philipson pulley, 4 four chain drive combination and all chain drive sporting model in stock.—Wilkin, Hunter's Bk Sheffield. [X247]

## N.S.U.

N.S.U. Combination, 4 h.p. mag., m.o.v., spring forks; £16/10.—24, Cargill Rd., Earsfield. [X48]

## N.U.T.

1915 N.U.T., 8 h.p. J.A.P. overhead valves, adjustable pulley, horn, tools, as new, guaranteed perfect; £45, or best offer.—Day, Okehampton. [X23]

## O.K.

O.K. Junior, 1915, 2 speeds, as new; £25.—65 Rosendale Rd., West Dulwich. [X48]

1916 Brand New 2 h.p. O.K.'s, two in stock, 2-speed countershaft, climb any hill; £23 each.—Griffin Coombe End, Radstock, Som. [X25]

2 h.p. 1914 O.K., 2-speed, lamps, horn, and spare perfect running order, climb anything; £19 Griffin, Coombe End, Radstock, Som. [X25]

O.K., 3½ h.p. T.D.C., Brampton gears, cane sidecar speedometer, lamps, horn, smart, sound outfit; £30; owner enlisted.—64, Spring Bank, Hull. [X24]

## P. and M.

ALMOST New 1914½ Phelon-Moore Combination fully equipped; great bargain, £65.—Adson, 4 Kirkgate, Wakefield. [X48]

P. and M., first-class condition, done under 2,000 miles, Lucas lamps, speedometer, etc., complete £50.—Box 200, c/o The Motor Cycle. [X48]

1912 P. and M. Combination, 2-speed, clutch, kick start, decompressor, horn, head, tail lamps; gns.—Troward, Heathurst, Vale of Health, Hampstead. [X23]

P. and M. Combination, handsome Montgomery coachbuilt sidecar, lamps, luggage grid, very little use, beautiful condition throughout; £48.—15, Warw Court, Holborn. [X23]

P. and M. Coachbuilt Combination, bought November, 1914; hood, screen, lamps, and horn, mileage 2,500, unused through winter, appearance as new, a trial and examination; £55.—Box L973, c/o The Motor Cycle. [X28]

**NEW & SECOND HAND  
MOTOR CYCLES.  
MOTOR CLOTHING  
ACCESSORIES**

MARCH 23RD, 1916.

# THE MOTORCYCLE

ESTABLISHED IN 1903

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## OVERSEAS TRADE.

**MOTOR CYCLE MANUFACTURERS' EXPERIENCES OF DIFFICULTIES CONNECTED WITH THE EXPORT TRADE. SOME ILLUMINATING FACTS FOR THE BOARD OF TRADE. THE DIFFICULTIES OF THE GOVERNMENT.**

**T**HIS subject is one which we have been dealing with for some time past. Our sole endeavour has been to foster British trade and improve the existing conditions for the export of motor cycles, not only in respect to the more ready collection and transport of goods by rail, but also to expose the delay at the docks and the time required to obtain licences from the Board of Trade to export goods to neutral countries. It will be well within our readers' memory that the Government have for some time past wisely exhorted manufacturers to concentrate on overseas exports with a view to preserving our balance of trade, imports at the moment exceeding by a 1.52 to 1 ratio the value of British exports. Motor cycle manufacturers have naturally, in common with others, done their utmost to carry into effect these requests, and, consequently, it is all the more irritating to them to find obstacles placed in their path. The matter became so serious and complaints so rife that we drew the attention of the Board of Trade to it, and received a reply requesting us to furnish the department with particulars of specific instances of delays which have occurred. A fortnight ago we mentioned this fact in these columns, inviting manufacturers to provide us with the necessary information, and we must express our thanks for the evidence furnished, which is an overwhelming proof that complaints are by no means unfounded. We may now express the hope that the Board of Trade will be able to bring about improved conditions—we recognise that the task is no easy one in view of the tax upon all modes of transport occasioned by the world-wide war—and so facilitate the

export of British-made machines. By so doing, not only will much-needed gold be brought into this country, but British trade connections will be preserved which will prove invaluable when peace returns. Undoubtedly if the Board of Trade is able to effect a general improvement the volume of export trade will increase, as manufacturers will be encouraged to do their utmost to concentrate on orders from abroad, whereas at present their zeal is damped by the obstacles encountered. These obstacles cannot be swept aside in a week, nor can they be wholly condemned, but in face of Government appeals to increase our exports, it is time that the matter should be ventilated.

We quote a few typical extracts from letters we have received from manufacturers, from which it will be seen that the difficulties in the way of exports mainly apply to neutral countries. The same difficulties do not exist when British possessions are concerned, licences to export not being necessary with our Colonies.

**Royal Ruby Cycle Company, Ancoats, Manchester.**

"We think it is quite time that something was done regarding the export trade of the country, and there is no doubt it would be very advantageous if some arrangements could be made whereby the material required for goods for export could be obtained with greater ease, and also that some facilities should be given to firms to clear these goods quicker than has been done since the war commenced.

"As regards the granting of licences. In one or two cases we have had great difficulty in getting these in reasonable time; but we are pleased to say that the last licence we wanted we obtained very quickly, but we think the reason of this was that the machines were without tyres. We experience the greatest difficulty in getting the goods away when ready. It often takes us weeks to get the goods removed from here, and then we find when



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they arrive at the docks that they are shut out from the boat, and have to wait until they can get cleared.

"We have a case now as under:

"For instance, on January 12th we handed the railway company here seven cases of motor cycles for shipment to New Zealand. They were sent to Liverpool to catch the s.s. *Olaki*, and although they were there quite a week or ten days before the boat sailed, for some reason or other these goods did not get taken on board. When they missed this boat in Liverpool we asked the shippers, Messrs. James Dowie and Co., 15, Water Street, Liverpool, to have them sent on to catch the next boat from London, and although they assured us that they made every effort they could to get the goods away, they were unable to get the railway company to take them from Liverpool to London. Consequently, the goods have been lying in Liverpool ever since, and we are hoping that they will be put on board the s.s. *Middlesex* some time next week."

**The Triumph Cycle Co., Ltd., Coventry.**

"The difficulties in obtaining licences to export motor cycles abroad, and also the difficulties in the way of transit, are very great. As regards the licences, we experience the greatest difficulties in obtaining permission to export machines to neutral countries. We do not think that we have a right to complain about this.

"As regards the railway companies, we have experienced some difficulty ourselves; but here again we understand that it is simply on account of the preference which Government orders must necessarily have."

**Hobart Bird and Co., Ltd., Coventry.**

"Prior to the war we were developing trade rather extensively throughout Holland, and for the past two months we have had a large number of our two-strokes prepared ready for shipment to that country, but we have not been able to obtain the necessary permit from our War Trade Department. We know that other manufacturers are experiencing the same trouble with regard to Holland, but the particular agent who is representing us has already had his books thoroughly examined by an accountant from the British Consulate, so that in this particular instance there should be no reason for our not shipping machines to him.

"Respecting Denmark, we were kept about six weeks without the necessary licences, but these have just come to hand, but it is a matter for regret that such time should elapse. Perhaps, however, with your assistance matters may be much improved."

**Douglas Brothers, Kingswood, Bristol.**

"We thank you for the attention and publicity you intend giving to a matter that should interest manufacturers in general.

"We cannot supply you with any information, as we have not experienced anything but the ordinary business delays in obtaining permits for shipping goods abroad.

"We believe, however, that there is some difficulty encountered, and with which to a great extent we agree, when permits are required for shipping machines to foreign countries, but we are very pleased to be in a position to say that our export trade at the present moment is done exclusively with British Colonies."

**A Birmingham Manufacturer.**

"Frankly, I cannot for the life of me understand the present extraordinary conflicting action on the part of the Government. Only a fortnight ago Mr. Asquith was emphasising the importance of increasing exports, yet, in spite of this, it is next to impossible to get goods shipped, and the difficulties put in the way of manufacturers as regards production are most serious. During Christmas week an order was cabled to us for one hundred machines from a new-firm, but we had to turn it down.

"Trade or no trade, it appears to me that the authorities regard the motor cycle merely as a *matter of luxury, and of no consequence whatever*, and that all machinery capable of making motor cycle engines should be on munition work. So far as I can see, our politicians do not recognise the value to the country of the goodwill of the industry.

"Where British manufacturers cannot supply, the Colonials must, in order to earn their daily bread, take American machines, and when the American is once in

there are reasons, and substantial ones, that make it difficult for the trader to go back to the British machines when the British manufacturers may be able to supply.

"I think it must be recognised sooner or later that the motor trade as an industry has probably been able to render almost greater service than any other industry, but our goodwill is suffering in consequence.

"There are plenty of luxury trades, particularly in this city, which industries have not probably rendered any service at all to the country, but they are allowed to go on as usual, whereas this industry, which renders good service, is handicapped in every possible direction."

**W. H. Whitehouse and Co., Friar's Road, Coventry.**

"We have certainly experienced delays in all of the directions you mention, but by what we might almost term a coincidence the whole of these have now been removed. We have obtained all the licences for which we have applied, and the railway company in turn has accepted the whole of the delayed traffic, so that possibly your efforts are already commencing to bear fruit."

**Hendee Manufacturing Company.**

"We have exported quite a few British-made sidecars, and really had no particular difficulty in getting them despatched.

"Where we are held up is on the question of tyres. We seem to be unable to obtain licences to ship tyres either to Sweden or Denmark."

**W. J. Green, Ltd., Croft Road, Coventry.**

"So far we do not think we have any cause for complaint in the question of licences for export of motor bicycles or delays in transit. There may have been an isolated case, but, generally speaking, no interruption of business. At the same time we may add our appreciation of the efforts you are putting forward in the interests of the trade."

**Tozer, Kemsley, and Fisher, Ltd., 84, Fenchurch Street, London, E.C.**

"The bulk of our motor cycles are shipped to the British colonies, consequently export licence is not necessary for these. We do no business in Europe, but when shipping motor cycles to Japan, Siam, and Java, we always have to obtain licences, and find we can obtain these without much difficulty or delay. We know transit difficulties have occurred."

**The Sun Cycle and Fittings Co., Aston Brook Street, Birmingham.**

"Up to the present we consider that we are fairly fortunate in getting licences, although there is bound to be delay, but we make no complaint, as, in our opinion, it is necessary for the Government to make all the enquiries they think proper in the interests of the country generally.

"The only difficulty that we have at the moment is that we have orders and actual money to the extent of £250 for motor cycles for shipment to Sweden, and, although our customer has got the necessary documents declared by the British Consul and the local Chamber of Commerce, we cannot ship these goods, as the War Trade Board will not issue a certificate on account of an arrangement made with Sweden that Sweden allows us to ship an equal quantity of goods through their country into Russia—a *quid pro quo* which, in our opinion, is one that we cannot complain against, and is in the interests of the Allies generally at the present time."

**A. J. Stevens and Co. (1914), Ltd., Wolverhampton.**

"It has been no uncommon thing for a period of five weeks to occur between the date of our application and the granting of the licence; on the other hand, in numerous instances we have received the grant within a week or ten days, and the latter experience tends, in our opinion, to show that there is much unnecessary delay and disorganisation in the department responsible for the issue of these licences, even after making due allowance for the fact that certain applications require more careful consideration than others. However, provided that application is accordingly made sufficiently in advance of the required date, this particular point does not appear to us to be serious when compared with the question of rail and dock delay.

"At our particular centre the latter trouble has assumed very serious proportions during the last two months, and

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if it increases it will virtually mean the extinction of our export business. As a case in point, at the present moment we have a consignment of motor cycles which has been awaiting acceptance by the rails for either Birkenhead or London Docks for the last month or more, and daily efforts to get these carried, by any one of three railway companies, for numerous vessels, the names of which have been duly passed to us by the shippers, have so far been without result! The docks are either 'entirely closed,' 'closed for all but war traffic,' or else 'No! The ss. — is not on our list!' Meanwhile, the money is standing idle, the foreign or colonial agents in question are losing their orders, and our hold on our Overseas trade is slipping from our grasp. More often than not nowadays the rails state that they cannot carry for the vessel whose name the shippers have passed to us, and after a week of futile efforts, the name of a fresh vessel will be passed to us from the shippers, with the information that 'this vessel is now loading at the — docks,' but fresh efforts on our part are, as likely as not, no more successful than before, and one can readily imagine the state of congestion which can rapidly arise in the packing department as export cases multiply for weeks through this trouble. We could, moreover, quote instances which go to prove our contention that the rails alone are often to blame in the matter."

**Humphries and Dawes, Ltd., York Road, Hall Green, Birmingham.**

"It takes upwards of a month for the War Trade Dept. to say yea or nay to an application, and in one case for exportation to a neutral country they have just refused us a licence for some thirty odd machines, although why they should do this with our goods we do not know, since the British war authorities say they are not the slightest use to them for war service, and do not patronise us.

"We may say our Dutch agent has offered to keep records and numbers of machines as to where every single one is sold, and further we believe the Netherlands Overseas Trust extract from possible importers a deposit of some hundreds of guilders as a precautionary measure against any breach of faith."

A leading manufacturer who prefers to remain anonymous writes: "On March 14th we received an official order from the Netherlands Overseas Trust for a quantity of sidecars to go to our agent in Holland.

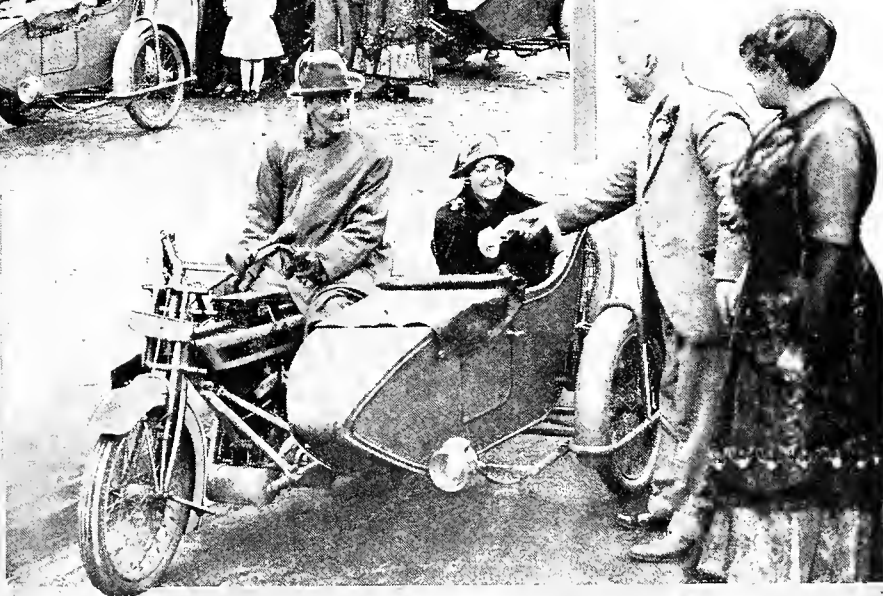
"We have the sidecars all ready to despatch, but are unable to obtain application forms for export licences from the War Office Board of Trade, their excuse being that they are entirely out of them, and do not know when they will have any more from the printers. This is certainly a nice state of affairs."

## A MOTOR CYCLE WEDDING.



Collier and Sons, Ltd.), and Mr. and Mrs. Mellano, of the Hutchinson Tyre Co.; while a congratulatory telegram was sent by *The Motor Cycle*. The motor cycle and sidecar shown in the illustration was a present from the firm to the bride and bridegroom.

After the ceremony Mr. and Mrs. Wensley left for Hastings, where the honeymoon will be spent. We wish them all joy and happiness.



ON the 15th inst., Miss Gertrude Collier, daughter of Mr. H. H. Collier, managing director of the manufacturers of the famous Matchless motor cycles, was married to Mr. Charles Wensley, at St. Margaret's Church, Plumstead Common. Miss Collier has worked for seven years in her father's office, and has proved herself invaluable. The wedding was entirely a motor one.

Among the guests were Mr. and Mrs. H. H. Collier, Mr. and Mrs. H. A. Collier, Mr. and Mrs. C. R. Collier, Mr. and Mrs. A. Walker (representing Messrs. H.

The motor cycle wedding of Mr. Charles Wensley and Miss Gertrude Collier. The start for the honeymoon on a Matchless sidecar outfit. Mr. H. H. Collier (inset) wishing the couple good fortune.



### Top Feed Carburetters.

"A Tramp" writes to emphasise a further defect in the average carburetter, on which petrol enters the float chamber at the top. The lid of the float chamber and the petrol union are both screwed joints, and "A Tramp" asserts that the screw threads of such lids are usually badly cut, and that, as it is generally difficult to screw up the lid to the same place every time it is dismounted, constant variations of jet level occur. It is bad practice—with so many duffers about—to employ double screwed joints, and top feed carburetters would be the better for spring clamped lids pegged into holes. But I do not know a single screwed lid with a bad thread, and deny the variation of levels which he suggests. So long as you do not cross the threads and screw the lid right home you get the correct level every time.

### Intermittent Sticking of the Bell Crank.

My experiences with intermittent sticking up of the contact breaker bell crank of a magneto have provoked a whole crop of parallels. Mr. J. W. G. Brooker has experienced it with a light car, and only traced the cause of his engine's starting reluctance when the bell crank finally stuck up for good. A long and interesting letter from Sgt.-Maj. Bernard Siffken—now unfortunately invalidated home from the Front—describes how his bell crank always sticks up in damp weather, but frees itself so regularly after a few attempts to start that he has never bothered to ease it. He adds that the trouble has not been at all uncommon in France with engines of all types and sizes, and endorses a staff opinion—from which I dissent very strongly—that the "baby" two-stroke is the best machine for winter despatch riding in Flanders. My own bell crank has been eased since I last wrote, and now functions admirably.

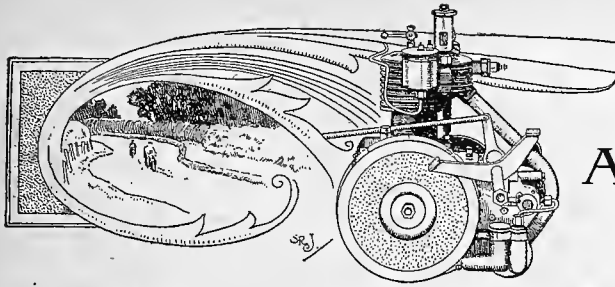
### American Advertising.

I have just read a booklet which—if I were a novice—would lead me to suppose there was only one sane motor cycle manufacturer in the world. Of course, it may be so, but I dare not award anything beyond the excellent Scottish verdict "Not proven" as yet. The firm in question sell a 1 h.p. two-stroke set for clamping inside the diamond frame of any push bicycle. I have not tried their set, so I must not dogmatise. But there would be several points on which I should require to be satisfied before I so much as rode it round a block. For example, is not the success of the Auto-wheel chiefly due to the fact that it dodges the need for strengthening a push bicycle frame before even the weakest motor set is fitted? If this is so, is it wise or right to advise fitting motor sets to push bicycles without qualification? Secondly, will even a 1 h.p. two-stroke engine run any appreciable distance on a

fixed gear of 10 to 1 without overheating? Or, if it will, how soon does the cylinder require decarbonising, and how does the warm little engine conduct itself on facing a long grade after, say, five miles of its alleged 25 m.p.h. on the level? Thirdly, is it quite accurate to imply that a buyer's choice is confined to selection between motor sets scaling 21 lb. and "ordinary motor cycles weighing about 250 lb."? Fourthly, is it even approximately true that any "petrol-lubricated" two-stroke is "practically free from oil and grease as compared with the regular motor cycle"? I ask these questions in all seriousness. The ultra-light-weight machine has fallen into discredit very largely because it could not behave itself on a gear low enough to make it genuinely roadworthy, and because the valves of wee four-stroke engines could not withstand prolonged hard work. If a lilliputian two-stroke will stand a gear of 10 to 1, half the troubles are solved immediately; with a 2 to 1 reduction on the chain, we only need a 5 to 1 reduction on the belt; and a pulley of the indicated diameter, coupled with the even torque of a two-stroke engine, makes an encouraging proposition. But—geewhizz—if I set any two-stroke engine in my acquaintance to run ten miles on even a 7 to 1 gear, the thermometers in the whole of the county would go up ten degrees apiece; why, my present two-stroke almost welds its piston to its cylinder after not more than 600 yards up a test-hill near my house on a bottom gear of 8½ or thereabouts.

### Handle-bar Clutches.

I read Mr. Batten's notes under the above title with great interest, but hardly thought he was sufficiently judicial. He is all for the handle-bar clutch control, as I am myself, but he did not state the factors which limit my own enthusiasm. Almost any old handle-bar control will do for a sidecar, because the machine is self-balancing, and as a consequence the slight temporary derangement of the steering, inseparable from handle-bar control of bad leverage, does not really matter. I doubt if Mr. Batten realises this point, because he happens to use a machine which has excellent clutch leverage; but I am slow to praise handle-bar control unreservedly, because so many makers are utterly ignorant of the simplest laws of leverage, and a handle-bar clutch on a heavy solo machine is a fearful nuisance unless the leverage is good, and the touch proportionately light. Give me a light handle-bar control, and I will esteem the man who praises foot control a raving lunatic; experience of stiff h.b. clutches is solely responsible for the survival of pedals, which are intrinsically wrong, stupid things. Brake pedals would have passed out of vogue years ago if only nature had endowed us with an extra hand.



## AMATEUR REPAIRING.

### How Two Brothers Overhauled a Second-hand Mount.

THERE must be many readers of *The Motor Cycle* whose interest in the pastime is not confined to purchasing a brand new model every season. There must also be a large number of comparatively young riders who are able and willing, nay, prefer to enjoy motor cycling without kick starters and electric equipment, or even speed gears and free engines. These excellent and respectable devices, though admirable in themselves, seldom fail to detract from the charm of a machine in the eyes of the young and enthusiastic.

It is principally for this class, whose heads are better stored with brains than their pockets with money, that the author gives here a short account of what he did to a particular machine in the way of repairs. Be it noted that no special tools or even a good supply of ordinary ones were used. A few spanners, screwdrivers, large hammer (most useful of "inducers"!), a hacksaw, and two or three files were the principal items in the outfit: the want of a vice was greatly felt, but many curious domestic fittings, such as an old broken grate bottom and a fender, were taught to act as substitutes, and held all manner of shapes during the work.

#### First-class Condition!

The motor cycle in question was a 1913 T.T. Ivy with a  $3\frac{1}{2}$  h.p. overhead valve Precision engine. It was obtained from a dealer in second-hand machines for another machine and a small cash payment in the usual manner. It was briefly described as being in "first-class condition." Having had a certain amount of experience with dealers, the author was under no illusions as to what to expect. Being on sick leave and having plenty of time to take the machine in hand, he was not dismayed at the state of affairs which is here briefly described:

ENAMEL.—A few islands in a sea of dirt and rust.

PLATING.—Fairly good.

TYRES.—Both quite worn out, canvas showing.

BELT.—Worn out.

ADJUSTABLE PULLEY.—Worn out.

FRAME.—Cup containing ball race at top of steering head cracked, evidently by the thrust of the spring forks. This cup was an integral part of the frame, and its being cracked allowed over  $\frac{1}{2}$  in. backward and forward play.

ENGINE.—Gudgeon pins and little ends worn out; one big end (the central one, working between the forked end of the other rod) with cracked bush. Several crank case bushes, including pulley side main bearing, loose and rotating in their bosses.

In general, nearly everything possible was loose and out of adjustment, and many small fittings were either lost or ruined.

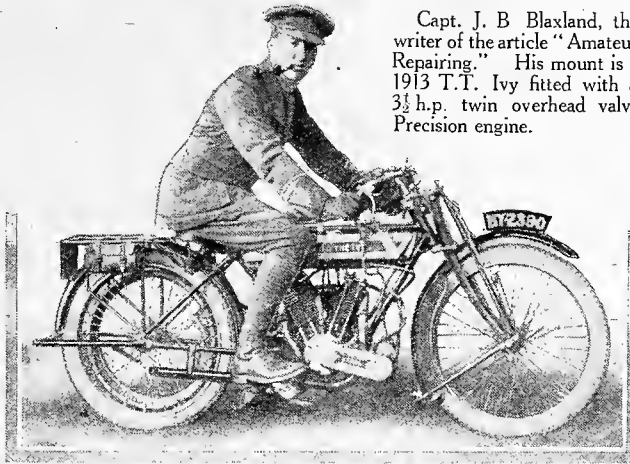
#### The Work Commenced

In spite of this somewhat alarming list, the machine had plenty of good stuff in it, and seemed well worth the money.

It was decided to do the job thoroughly, and to avoid all patching up. The pleasure of riding would be greatly enhanced by knowing everything had been thoroughly done, even though it meant a long delay. The evening of the Ivy's arrival saw the

author and his younger brother reducing the machine to its lowest terms in parts, bolts and nuts, etc. This was done till nothing remained in its place save the spokes and belt rim, which were all right. Next all enamelled parts were cleaned of their remaining enamel and rust and dirt.

The old enamel was removed by means of Nameloff, a wonderful preparation, whose action is as powerful as its odour! It softens the enamel, which may then be taken off with a scraper in long strips. Emery cloth and "elbow grease" removed the rust, and finally all the parts were as shining silver. This accomplishment was only achieved after long and patient work: without Nameloff it would be next to impossible unless one were "doing time" and lacked other interests. The parts for enamelling were then painted with a dark red shade of Velure. This is very slow in drying, it was found, but it gives as brilliant a surface as stove enamel, and if well crossed is smooth and quite free from the thick, lumpy look of most amateur efforts. One coat is sufficient when properly applied: the surface is spoilt by a second.



Capt. J. B. Blaxland, the writer of the article "Amateur Repairing." His mount is a 1913 T.T. Ivy fitted with a  $3\frac{1}{2}$  h.p. twin overhead valve Precision engine.



**Amateur Repairing.—**

The tank presented the only difficulty. It had been resolved to panel this in the usual manner, the colours being dark red and cream. The panel outlines were marked with indelible pencil on the tin, and then one colour was applied so as to reach exactly to the lines. Any mistakes were corrected and wiped clean at once. With patience and a steady hand it is not difficult to get a very good line this way. When the first colour had dried the other was applied in the empty spaces. No mistakes were permissible or there would have been a blotchy appearance. With care this ticklish job was successfully carried out, and the finish was very little inferior to the best professional work, though, of course, rather simpler. Transfers were obtained from the makers and fixed with hard varnish, and there was the completed article. Lining was not attempted, as anything but perfect work of this sort looks horrible, and, of course, many machines when new are not lined, yet look quite smart.

**Mending the Steering Head.**

When the parts were dry the machine was gradually and carefully assembled, many little details being attended to in the process, and every nut being scrupulously cleaned before being screwed up. The fractured steering head cup was repaired by a strong clip which was made from the old long exhaust pipe clip. This had to be carefully thought out and entailed much work, but anyone with commonsense would arrive at the solution, and it is absolutely sound and satisfactory after test. Its cost was *nil*, and it saved unbrazing the frame and fitting a new head. Several new clips for the silencer and long exhaust pipe were also made to replace small screws which were no use at all, and then the whole exhaust system was firm as a rock.

After some unavoidable delay, the engine parts that had been sent to the makers were returned repaired. The engine was then very carefully erected and timed and the whole power unit adjusted wherever

necessary before being inserted in the frame. All the controls were examined and the cables shortened and resoldered where necessary, and every little detail on the machine was thoroughly examined and adjusted. As there had been fitted two new tyres, a new belt, and new adjustable pulley, the appearance resembled that of a brand new model, and one had the satisfaction of knowing everything to be sound and satisfactory.

The final delight was that the little twin got into its stride immediately, the only thing lacking being power at low speeds. This was greatly improved by reducing the choke tube, but the author hopes to go one better still with a modern and more efficient carburetter.

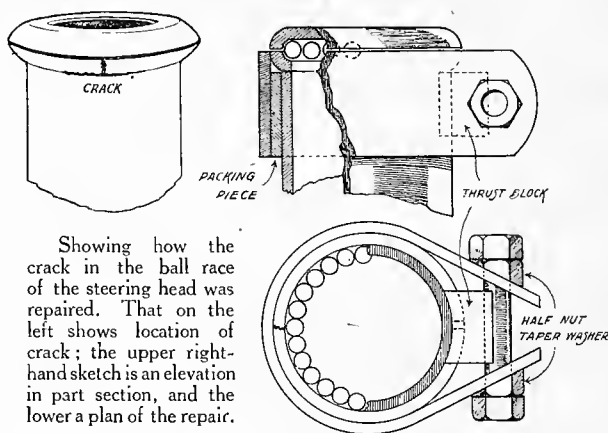
No trouble whatever has been experienced, and so, though very little money has been spent, the machine is in splendid trim. The only real expenditure was in time and trouble, but the work was all very interesting and stimulating. The total cost was about £7 10s.

As regards the machine, those readers mentioned at the beginning of this article will probably agree that for a neat, compact sporting machine it would be hard to beat this design. It affords a most delightful riding position and steers readily "hands off."

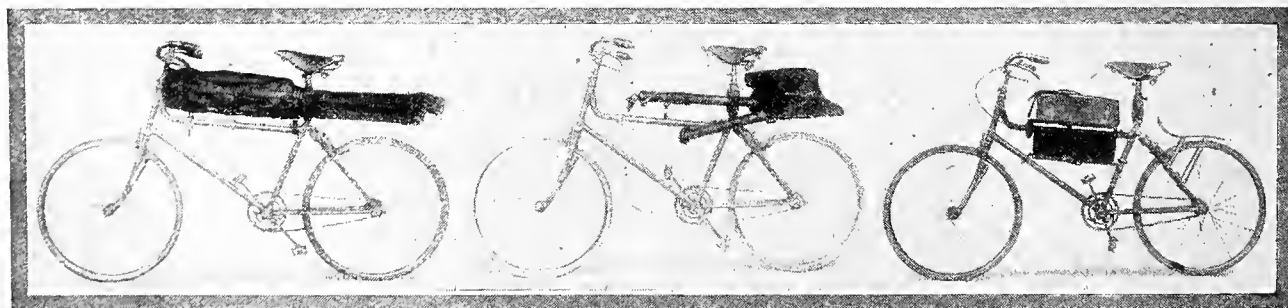
The little 3½ h.p. twin engine is an eye-opener in "revving"; there seems no doubt at all as to the efficiency of overhead valves.

In conclusion, any handy amateur can do the sort of thing described above if he really determines not to be beaten, and he will do it much better than anyone else—barring the makers—as it is his own beloved mount he is restoring to health. He will gain an enormous amount of knowledge in the process; will discover how to do difficult jobs with the simplest tools (which suffer in the process!), and will improve his vocabulary 50% because of the "cussedness" of inanimate objects, more especially bolts. But he will enjoy himself and get a really substantial reward for his trouble.

J. B. BLAXLAND.



Showing how the crack in the ball race of the steering head was repaired. That on the left shows location of crack; the upper right-hand sketch is an elevation in part section, and the lower a plan of the repair.

**PEDALS VERSUS ENGINE POWER. ITALIAN ARMY CYCLIST MACHINE GUNS.**

Italian army pedal cycles carrying machine guns in parts. One gun is spread over three machines, as illustrated. On the left is the bicycle carrying the gun barrel complete, then the machine carrying the tripod, and on the right the ammunition box and small parts. These bicycles are attached to the world famous Bersaglieri, and it is interesting to compare them with the more modern British motor machine gun outfits.

# THE HOCKLEY TWO-STROKE.

A Lightweight Specially Designed for Use in Overseas Parts.

**I**N order to produce a lightweight machine which is sufficiently strong to withstand the rough tracks encountered in some of the Overseas Dominions the Hockley Motor Co., Birmingham, are producing a 2½ h.p. two-stroke with a specially strengthened frame. This is done by an extra down tube, extending from the top of the steering head to the crank case cradle, by means of which the front of the frame is triangulated, and the steering head, which is unusually long, is amply supported.

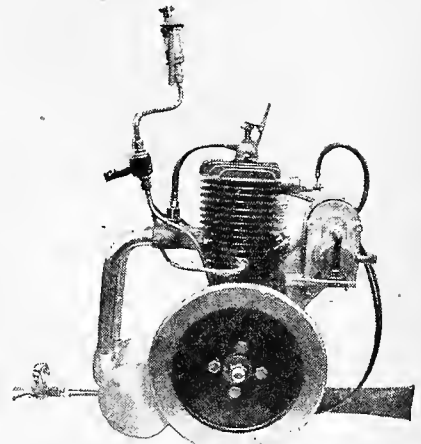
## The Engine.

The 2½ h.p. engine, which has a bore and stroke of 70 mm. (269 c.c.), incorporates several interesting features, the most important being, perhaps, the system of lubrication. This is carried out by means of a suction drip feed, which delivers the oil to a distributing box situated just above the level of the engine on the down tube of the cycle.

The oil is led from this box by three separate pipes, one going direct to the cylinder wall, the other two to each of the main bearings. A ball valve is fitted at the entrance to the distributing box, so that if the oil should be left turned on when the engine is stationary the oil does not flood the crank case. This method, we are told, has proved both economical and efficient.

The transfer passage in this engine is not cast entirely enclosed as in most engines, but is fitted with an inspection cover, and, being made in this manner, it enables better and more accurate machining to be effected. The exhaust is led to the silencer *via* two exhaust pipes, while the compression release is also connected by a pipe to the exhaust pipe, thus obviating the objectionable hissing caused when the release is direct into the air.

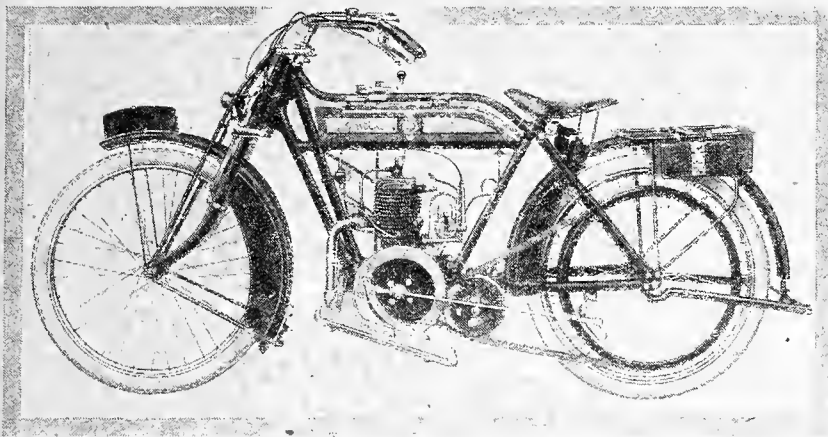
The silencer is merely an expansion box from which the gas leaves *via* an extension pipe.



The Hockley 269 c.c. two-stroke engine. Note the special lubricating device on the left, which takes oil to a distributing box, from which it is conveyed to the various portions of the engine. Also note double exhaust pipes and inspection covers to the transfer passage.

## Other Details.

The magneto is placed on a bracket cast in one with the crank case, is situated high up behind the cylinder in a place where it is well protected from the influence of mud and water, and driven by an enclosed chain. A two-speed, countershaft gear with chain and belt transmission is fitted. The belt rim brake is actuated by a most substantial pedal, while the good ground clearance and substantial frame construction should render this machine very suitable for Overseas use, for which it was primarily intended. Unfortunately, owing to the scarcity of material, especially aluminium, the firm tell us they have many more orders than they will be able to cope with for a considerable time.



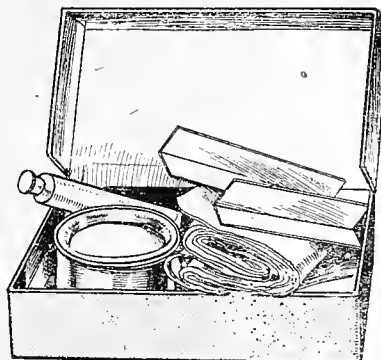
The 2½ h.p. Hockley lightweight two-stroke. The special design of frame is claimed to give great strength to resist the bad road conditions overseas, for which work the machine is specially intended.

## STOPPING PETROL LEAKS.

**M**ESSRS. THE COUNTY CHEMICAL CO., LTD., Bradford Street, Birmingham, have lately placed on the market a useful outfit for the purpose of stopping petrol leaks. With petrol at the present price, motor cyclists are naturally only too anxious to save every drop of the precious fuel, and a leaky tank or petrol pipe, irrespective of the inconvenience which attends it, will cause the motor cyclist deep anxiety when he thinks how rapidly the valuable fluid is escaping. The outfit contains a tin of Chemico Petrol Stop, a supply of bandage, a couple of angle plates, and a tube of shellac varnish.

### How to Effect the Repair.

The method employed to repair the leak is to cover the place copiously with the paste, after the surface to which the paste is to be applied has been thoroughly



The Chemico petrol leak repair outfit, a new introduction which is described herewith.

cleaned. The place should then be bound up as tightly as possible with the bandage, and the exterior surface thereof should then be painted with shellac varnish to prevent exterior moisture from reaching the paste, also forming a further protection for the repair itself. For the case of a repair occurring at the bottom or corner of the tank where the bandage could not be made to lie close enough to the repair to keep the paste up to its work, angle plates are supplied, and in a case of this kind the bandage is wrapped over the angle plate. It is not intended that the outfit should be other than a substitute for a proper soldered repair, but it is guaranteed to get the motor cyclist home, and a repair stopped in this way is claimed by the manufacturers to last satisfactorily for some hundreds of miles, and any reasonable length of time.

## THE COOPER SIDECAR.

A Handsome Body providing Closed Accommodation for Luggage.

**A** VERY attractive sidecar is that which is manufactured by Messrs. Cooper and Co., Belgrave Road, Birmingham. There are several excellent points about the design of the body, and apart from the appearance, which is most pleasing, probably the most attractive feature is the amount of room provided for the accommodation of luggage. It will be noticed from the illustration that the back of the body is bulbous in shape; the space within is entirely devoted to one large locker, access to which is obtained by the large door indicated by the dotted lines.

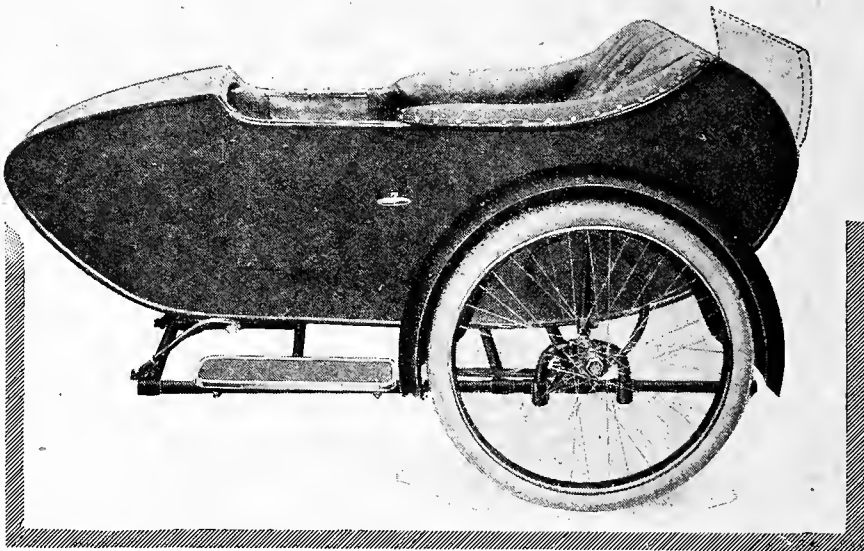
Although this bulbous back is in no way exaggerated, ample room is provided in the locker to carry comfortably a fairly large suit case or portmanteau. In this position the luggage is not only protected from the weather, but is not subjected to bumping and rattling, as when carried on the usual luggage grid. The nose of the body is constructed of metal reinforced by wood with a cane binding. In this manner the cracking and splitting of the joints so frequently noticed in coachbuilt bodies after wear is entirely overcome, while the wood reinforcement prevents denting. The upholstery is very well carried out in brown grained pegamoid, the back of the seat being sprung with the aid of coiled upholstery springs. A box spring cushion is provided, under which is situated the usual locker for spares.

### The Construction of the Chassis.

The chassis is quite a simple one, but is very strong, while the weight of the body is nicely distributed over the axle. Three-point attachment is used, and the

front connection is clamped to a special double tube framework on which it can be moved backwards or forwards for adjustment, while all tendency to twist is obviated. All three connections are quickly detachable, each requiring only one nut to be undone to remove them from their sockets. At the rear the body is suspended on Cee springs, while the front is supported on quarter elliptic. The method of attaching the springs to the chassis is noteworthy, as instead of being secured by the more usual loop

clips they are supported on special lugs brazed to the frame, to which the springs are securely clamped by substantial clips. The mudguard is also well designed, it being very wide, in addition to having a deep valance. It is supported on three strong tubular stays, from which it can readily be detached if required by undoing only three accessible nuts. A foot plate is attached to two lugs, also brazed to the frame, to facilitate mounting and dismounting from the car.



A Cooper coachbuilt sidecar, the features of which are referred to on this page.

## A DETACHABLE WHEEL AND TRANSMISSION SHOCK ABSORBER.

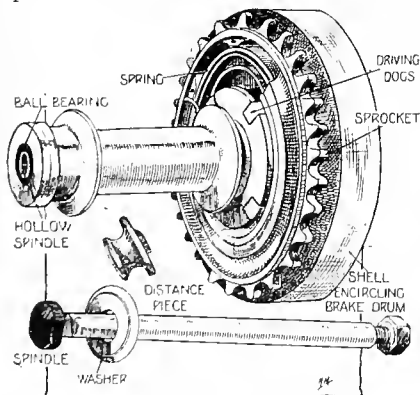
**A** N ingenious back hub comprising a transmission shock absorber and detachable wheel has lately been designed by Mr. David Levy, 17, Drewstead Road, Streatham Hill, S.W. At the end of the hub shell there is a disc in which four slots are cut, corresponding with four dogs on another disc, which is attached to the driving portion connected to the brake drum

by means of the spring. The wheel is removed by undoing the nut on the near side of the machine and withdrawing the spindle. On the spindle being withdrawn and the distance piece removed the whole wheel may be lifted out bodily. The hub runs on ball bearings on a hollow spindle.

### The Shock Absorber.

The transmission shock absorber consists of a coil spring, one end of which is attached to the periphery of the brake drum and the other end to the driving portion; consequently, any impulses of the engine are absorbed by the spring. In the event of the spring giving way or becoming detached dogs are provided which allow the drive to be solid. The movement of the spring is on ball bearings, as well as the sprocket wheel, which acts with the hub.

The design is particularly neat, and is well worthy of the consideration of the manufacturer who has not got a transmission shock absorber or a detachable wheel of his own. So far the device has only reached the model stage; but we are very well impressed with it, and consider it to be both well designed and ingenious.



Levy's detachable wheel and transmission shock absorber.



G. S. Oboukhoff, a prominent Moscow motor cyclist, who is now on active service with the army of our Russian Ally



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Too Strong a Mixture.

**[?]** I have a 1908 3 h.p. single-cylinder N.S.U., m.o.i.v., with low-tension Eisemann magneto and coil and Amac carburetter. It fires evenly when the throttle is slightly open, but when opened to half way it misfires. It will take full air at any speed. I have had trouble with a choked jet.—A.M.

The trouble seems to be due to the fact that you are using too large a jet, which causes the mixture to be so strong that the engine chokes. Try opening the air slides at the side of the spray chamber.

### Pre-ignition

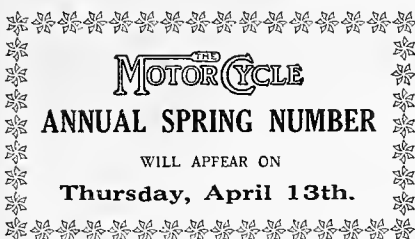
**[?]** I have a 1913 2 h.p. single-cylinder, single gear lightweight. (1.) It loses power quickly on hills. Often on a slight up gradient, with a head wind, it pulls up altogether, but starts again immediately when pushed off. (2.) It is fitted with a No. 26 jet B and B carburetter. Is this correct? (3.) If the pulley is twisted through the belt on, a certain amount of play is felt before the piston moves.—L.E.S.

(1.) The trouble is probably due to pre-ignition, which may be caused by either a faulty plug with unsuitable electrodes or to excessive carbon deposit. The piston rings being stuck in their grooves might also cause the engine to pull up in this manner when working hard. (2.) The size of jet you mention should be about correct. If too small a jet is fitted popping in the carburetter when trying to start will take place, and if too large a jet the engine will be inclined to choke. With your particular type of carburetter—that is, one that is not of the straight through pattern—if the correct sized jet is fitted it should not be possible to start the engine unless the air be fully closed. Then when running at speeds up to about threequarter throttle opening the engine should give the best results with the air opened to about the same extent. If more air than throttle is apparently needed at full speed, then the jet is slightly too large, while if at full speed only about half air can be given then the jet is slightly too small. (3.) It is probable that the big or small ends require rebushing; this should be remedied at once.

### Refusal to Start.

**[?]** My machine is a 1915 2½ h.p. single-cylinder lightweight, fixed ignition. I have had great trouble to get the machine to start, and found that there was no spark. I then returned the magneto to the makers, but the machine still refuses to fire, explosions continually taking place in the carburetter. The engine is perfectly free from carbon, the valves properly ground in, and the compression good. I should be obliged if you would let me know the likely cause of the trouble.—W.J.

First of all make sure that all ordinary adjustments are correct, i.e., that the plug is clean, and that a spark actually takes place between the points. This can be tested by removing the plug from the cylinder and placing the metal body against the cylinder, taking care that the terminal does not touch any part of the



machine; then revolve the engine smartly by pulling the back wheel over, when a good spark should be obtained. If no spark can be obtained, try a new plug. Make quite sure the high-tension wire is in order, and that the contact points are free and separating the correct distance, viz., .4 mm. You might also check the timing: exhaust valve to close top dead centre, inlet to close bottom dead centre; spark should take place when piston is within about 3 or 4 mm. from top of compression stroke. When these adjustments have been checked, next ascertain that petrol is reaching the carburetter, and that all passages and jet are quite clear; that no air leaks exist between the carburetter and engine. Make sure that all valves are closing properly. The clearance between the valve stems and tappets should be about .4 mm. If all these adjustments are correct an easy

start should be possible. Inject a few drops of petrol through compression tap to free the piston, slightly flood carburetter, shut air lever, and give only about one-third throttle opening.

### Sluggish Running.

**[?]** I have a 6 h.p. twin Rex machine, and, though I am a fairly experienced motorist, I cannot find out what is the matter with it. Even when riding solo it is impossible to travel more than 20 m.p.h. with 4 to 1 gear. Provided there are no bad bends in the road, I can climb a hill of 1 in 8 as fast as I can come down with engine firing. I can also travel as fast under ordinary circumstances with a sidecar as solo. Apparently it is not lack of power. I have tried a lower gear, but speed was reduced. I have tried the valves with all sorts of timings. At present the exhaust valves commence to open when the pistons are ⅞ in. from the bottom of the firing stroke. The inlet valves open just over the dead centre. The magneto points break when the piston is on top, with the ignition control lever almost fully retarded; so that I can fire very early if necessary. The spark at both plugs is very good. I have been wondering if the cause is that the flywheels are not properly balanced. Will you kindly say what you consider the cause of the trouble?—H.T.

There is evidently something very wrong with your machine; but it is difficult to say what the trouble actually is without seeing it. The symptoms certainly seem to indicate incorrect timing. You should make sure the exhaust valves shut at the correct time, viz., when the pistons are on the top dead centre. If this is correct the opening of the valves will come automatically correct, owing to the design of the cam. The opening position you mention seems about correct, provided the valves shut correctly. The other timing points you mention also seem to be right. You should make sure the valve springs are in good condition, and that the exhaust and inlet passages are both quite clear, and the silencer is in no way stopped up. Is it possible that incorrect balance might cause the trouble, though it is rather improbable. Try gearing higher.

### PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

In view of the decision of the Government to limit the import of material for the manufacture of paper it is imperative that every possible step should be taken to avoid waste of paper in any form. It has been the custom in the past for newsagents to order a certain number of papers for chance sales, and these copies if unsold become what are known as "returns"; in other words, waste copies.

In the case of "THE MOTOR CYCLE" the percentage of returned unsold copies has been remarkably low, but in order to conserve the supply of paper in future it is desirable that the waste of copies, ordered to accommodate occasional purchasers, shall as far as possible be eliminated.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in this matter by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.



### Machine for Business Purposes.

**?** My professional work involves me in much travelling, which, with the present restricted train services, leads to an enormous waste of time, and I am convinced that a motor cycle would prove an economy both of time and money. But what mount shall I get? I should have to do a minimum of 350 miles per week. The roads run through flat or undulating country, with only a few fairly stiff hills. I want a machine that is economical in consumption of petrol, as I must spend as little as is compatible with efficiency. Further, I should at times require a sidecar for my wife, but it would not always be necessary for my business runs. (1.) Would you advise a combination rather than a solo; and does a combination mean a much greater consumption of petrol when running empty? (2.) What horse-power would you suggest? (3.) Would a good second-hand outfit suit my purpose, or would you advise a new one? (4.) What mileage per hour should one allow on an average to a decent mount?—T.S.

(1.) If you intend doing most of your riding solo, and only taking a sidecar occasionally, we would not advise a heavy powerful bicycle such as is sold for use with a sidecar continuously. Of course, the higher the power and heavier the machine, the greater will be the petrol consumption. A single-cylinder is, of course, the least complicated, and requires the least attention; but, on the other hand, a twin, especially one of the horizontal type, is by far the more comfortable to ride and handier to manipulate, owing to the smoother running engine. There is very little difference between the general running cost of a twin and a single-cylinder of equal power, though probably the twin is lighter on tyres and transmission than a single. (2.) As you intend to use a sidecar occasionally, certainly not less than  $3\frac{1}{2}$  h.p. (3.) It would be better to purchase a good second-hand outfit rather than a cheap new one, though, of course, if you can afford it, a new outfit would

be preferable, as you then get the makers' guarantee. (4.) On give-and-take roads it takes a fast machine to average a greater speed than 20-25 m.p.h. for long distances.

### Double Pole Plugs.

**?** Would you kindly tell me if there is any great advantage in using double pole plugs in series with ordinary plugs on a 6 h.p. twin motor cycle when used for ordinary touring purposes, and not for racing or high speed, and can you advise me as to the best kind of plugs to use on such an engine (air cooled)? Is there any advantage in using single-point plugs, or are the two or three-point variety preferable? I am told the three-point plug with blade-like points is liable to cause pre-ignition. —H.C.

We do not think there is any particular object in using double-pole plugs. Use good single or multi-point plugs made by a well-known maker. A single-point plug is best if the engine is inclined to be oily, as the spark occurring at the same point each time tends to prevent oiling up. We do not advise the pattern in which the points have flattened ends.

### READERS' REPLIES.

#### Lack of Power.

As an old subscriber I am much interested in "J.R.'s" letter re his poor compression on front cylinder. I have run a 4 h.p. horizontal twin for a year, the first 2,000 miles with constant trouble in the front cylinder due to lack of lubrication. I had an oil tank fitted on to bolt under the petrol tank, and sight feed attached, with copper pipe on to the front cylinder. The result has been that I have done a big subsequent mileage with no recurrence of the trouble, and instead of my oil sump wanting refilling every 100 miles it will go nearly 400, by reason of the much cooler running. The maker of my attachment made two or three of these; the price is 24s. complete, and it is only a matter of having the cylinder tapped.—J. M. ROWELL.

In reference to "J.R.'s" trouble, "Lack of Power," in your issue of March 9th, I think he will find that the trouble is caused through the cam which operates the rod that lifts the exhaust valve becoming worn. The continual thrust of the end wears the periphery of the cam, with the result that the exhaust valve does not get sufficient lift to allow the waste gas to escape. "J.R." will, of course, need to take off the cover of the timing gear.—F. S. FANCEY.

### Hub Gear Sluggish Change.

Re query of "A.H." in *The Motor Cycle* of March 9th regarding trouble in changing gears with three-speed hub, this trouble is due to the load on the gear wheels inside the hub being too great to allow the spring actuating the gear change to slide the lower dogs into mesh, and is aggravated by presence of dirty oil. If "A.H." will *de-clutch* when changing down and close throttle slightly during the process, as in car driving, he will find his trouble disappear. The same difficulty is sometimes evident on starting from rest, even on the level, after having started the engine in the usual way with the kick starter or pedals, and while endeavouring to change down to middle or bottom before engaging clutch. In this case, slow up the engine before changing down. Hub gears give highest satisfaction with a slow-running or pilot jet carburettor on this account. Change up with a touch on exhaust lifter only, but use clutch for all changing down. Clutch failure is due to dirty condition of hub or to unsuitable or thick oil. Use sperm oil or ordinary good cycle oil, and wash hub out with paraffin frequently.—F.E.S.

### EXPERIENCES WANTED.

"J.K." (Liverpool).—Grado multi pulley for use on Triumph.

"SD 1755" (Darvel).—T.D.C. de Luxe with variable pulley and with two-speed countershaft gear.

"H.F.G." (Purley).—1915 5 h.p. Indian and sidecar. Durability, consumption, reliability, speed, and tyre wear.

### RECOMMENDED ROUTES.

BERKHAMSTED TO BIRMINGHAM.—R.H.D.

Berkhamsted, Fring, Aylesbury, Bicester, Aynho, Banbury, Gaydon, Warwick, Knowle, Solihull, Birmingham.

BROMYARD TO COLWYN BAY.—W.F.C.P.

Bromyard, Tenbury, Ludlow, Craven Arms, Shrewsbury, Chirk, Llangollen, Corwen, Cerrigy-Druidion, Llanrwst, Tal-y-Cafn, Colwyn Bay.

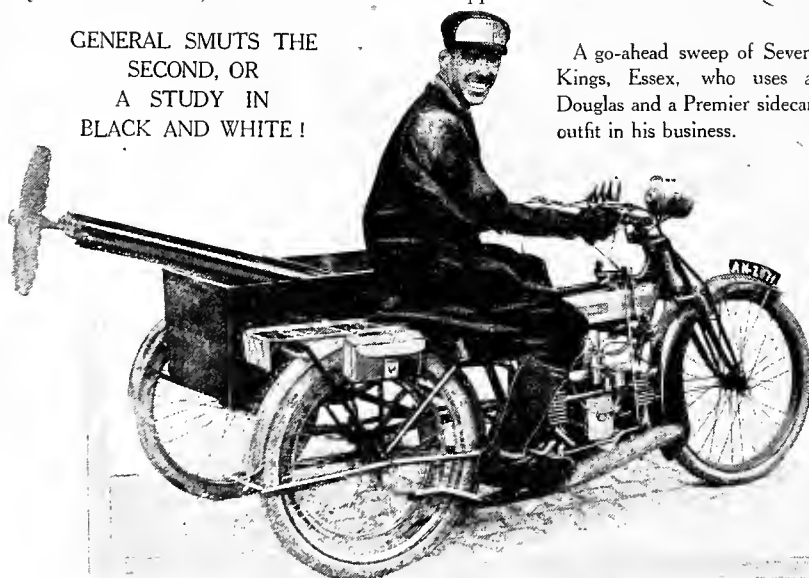
BRIGG TO ROMFORD.—J.G.E.

Brigg, Lincoln, Leadenham, Grantham, Stamford, Norman Cross, Alconbury Hill, Huntingdon, Godmanchester, Cambridge, Bishop's Stortford, Harlow, Epping, Theydon Bois, Abridge, Romford.

CARDIFF TO BRADFORD VIA BIRMINGHAM.—S.G.T.

Cardiff, Newport, Monmouth, Ross, Ledbury, Malvern, Worcester, Droitwich, Bromsgrove, Birmingham, Sutton Coldfield, Tamworth, Ashby-de-la-Zouch, Nottingham, Mansfield, Worksop, Doncaster, Wakefield, Bradford.

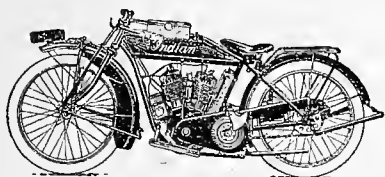
GENERAL SMUTS THE  
SECOND, OR  
A STUDY IN  
BLACK AND WHITE!



A go-ahead sweep of Seven Kings, Essex, who uses a Douglas and a Premier sidecar outfit in his business.

# Indian

Reliable  
under  
every  
condition  
and  
economical  
to  
run.



Model B, 5 h.p., 3-speed.

Send for List.

**HENDEE MANFG. CO.,**  
"Indian House,"  
366-368, Euston Road,  
London, N.W.

Telephone: Museum 1643.

Telegrams: "Hendian, Eusroad, London."

Irish Branch ... 10, Wicklow Street, Dublin.

Australia ... 109-113, Russell Street, Melbourne.

Canadian Works ... 12-14, Mercer Street, Toronto.

*The West End Garage  
and Repair Works,  
Eign Street,  
Hereford,  
3rd March, 1916.*

*Messrs. Hendee Manufacturing Co.,  
Indian House,  
Euston Road, N.W.*

*Dear Sirs,—You will no doubt  
be interested to know that we have  
been using one of your 5 h.p.  
Combinations for hire and other  
business purposes.*

*Although the machine has done  
many hundreds of miles, it has run  
perfectly the whole time, and now  
pulls better than when new.*

*The ease of control may be judged  
from the fact that one of our  
apprentices often takes a passenger  
of 11 stone for journeys of 50 miles  
and over.*

*The petrol consumption averages  
80 miles to the gallon on give and  
take roads.*

*Faithfully yours,  
(Signed) W. R. L. PAGE.*

*In answering this advertisement it is desirable to mention "The Motor Cycle."*

# B.S.A.

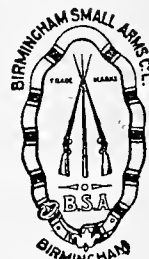
## MOTOR BICYCLES

### FOR SOLO & SIDECAR

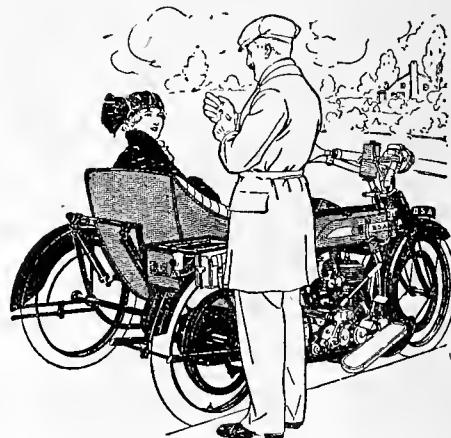
Business riders, tourists, naval and military men, all testify to the satisfaction which B.S.A. Motor Bicycles are giving, and whether you require a machine for commercial or pleasure purposes you too will appreciate B.S.A. reliability and efficient service. The  $4\frac{1}{4}$  h.p. B.S.A. fitted with B.S.A. Countershaft Three-Speed Gear will take a sidecar almost anywhere and, owing to its economical yet powerful running, is far and away superior to a heavy higher powered machine.

THE 1916 LIST OF B.S.A. MOTOR BICYCLES SENT POST FREE ON REQUEST.

THE BIRMINGHAM SMALL ARMS COMPANY LIMITED,  
13, SMALL HEATH, BIRMINGHAM

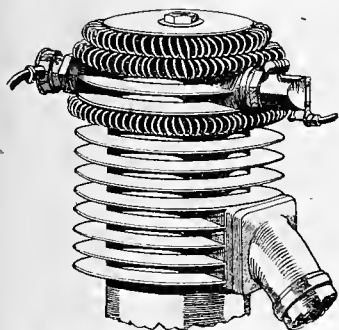


THE MARK OF THE  
"PERFECT IN EVERY PART"  
MOTOR BICYCLE.



**COOLGUARD SPRINGS.****Simple Device for increasing the Cooling Surface on an Air-cooled Engine.**

**C**OO LGUARD springs are made by the Priory Accessory Co., Coventry, for assisting the cooling of an air-cooled engine, more especially for small two-strokes. They consist of oval wire springs, which can be fitted



Coolguard springs shown fitted to a two-stroke Triumph cylinder to reduce the temperature.

round the cylinder head of any air-cooled cylinder, the narrow edge fitting between the existing radiating fins. By this means the surface exposed to the air for cooling purposes is very considerably increased. This method of cooling, as was pointed out in an article on cooling in *The Motor Cycle* of January 20th, was utilised without any other assistance whatever on the early de Havilland air-cooled  $3\frac{1}{2}$  h.p. engine, on which it proved most satisfactory.

The fitting of these Coolguard springs as an additional cooling device has the advantage that, although the amount of surface exposed to the atmosphere for radiation is increased con-

siderably, the passage of air to the existing cylinder flanges is hardly affected. Being made of steel wire, nickel-plated, they can be sprung into position on the cylinder irrespective of its size without difficulty. Though there is no doubt that had they been made of copper or brass they would have been even more efficient, they certainly would not have been so handy to fit, and would also have been more liable to be damaged by rough usage.

**WALBRO SIDECAR COMBINED HOOD AND SCREEN.**

**T**HE simple sidecar windscreen made by Messrs. The Walbro Cycle and Motor Co., Liggin Road, Ely, which was first described and illustrated in *The Motor Cycle* of December 31st, 1914, has now been improved and made to combine the effects of a hood and screen in one simple device. The original screen consisted of a curved sheet of transparent material somewhat similar to the scuttle dash windcreens used on aeroplanes. The latest Walbro screen has been extended, and now not only screens the passenger,



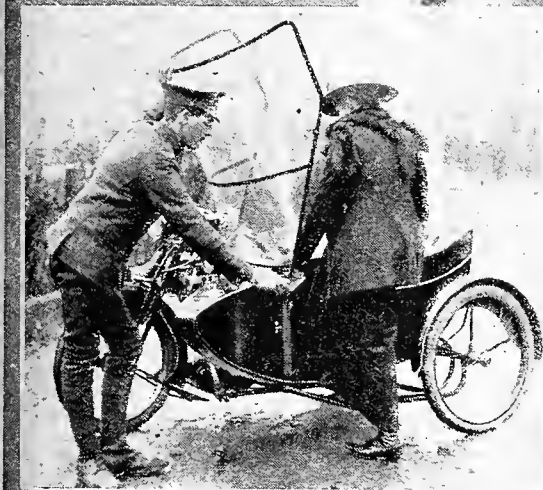
but also has the effect of a hood, and it is claimed to be a perfect protection for the passenger against wind, rain, or snow, and, being entirely made of transparent material, gives a perfect view of the countryside. In order to facilitate conversation between the driver and passenger a speaking trumpet is inserted in the screen. The whole shield is hinged in the front and lifts up bodily when it is desired either to enter or dismount from the car. One of the chief advantages over the ordinary hood and screen is that, owing to its shape, the wind resistance is reduced to a minimum, while it is extremely light and inexpensive.

**THE SPRING FRAME IVY.**

**S**PRING frames are certainly beginning to interest the British manufacturers, and we know of several firms who will undoubtedly be making machines so equipped by the time the war is over.

One of the latest firms to manufacture a spring frame is Messrs. S. A. Newman and Co., Birmingham, the makers of the Ivy. This machine has been undergoing tests for some time, and has now been passed as quite satisfactory, but there is little hope of the firm being able to deliver this model till after the war.

The rear springing has been obtained in a more or less orthodox manner, the back chain stays being hinged on substantial steel bushed bearings behind the gear box. The ends of these stays are attached to two laminated springs by means of two hinged uprights, in a similar manner to that adopted in the Indian. The springs are attached rigidly to the bicycle frame under the seat lug. When a sidecar is attached to the machine the rear main connection consists of a tube bolted through this lug. The wheelbase has only been increased  $1\frac{1}{2}$  in. by the springing.

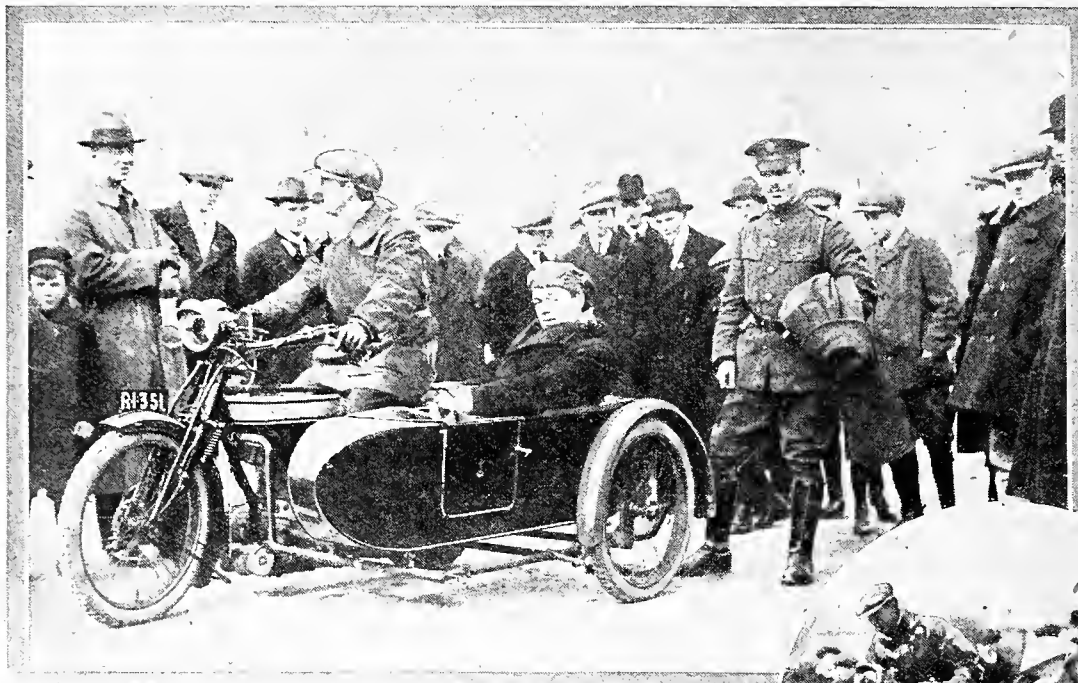


The latest Walbro sidecar windscreen has been considerably extended since it was first illustrated in *"The Motor Cycle,"* of Dec. 31st, 1914, so that it now takes the form of a combined hood and screen. Being made of transparent material, it in no way interferes with the passenger's view of the surrounding scenery, whilst conversation with the driver may be carried on by means of a speaking trumpet.



## ST. PATRICK'S DAY TRIALS.

THE  
DUBLIN  
CLUB'S  
TRIP TO  
GLENDA-  
LOUGH.



R. Fennell (4 h.p. Norton sidecar) on the starting line. The figure in uniform is T. E. Greene, the well-known Irish competition rider, who is now in the Mechanical Transport Section of the A.S.C., and was home on leave for a few days previous to going on service overseas. C. E. Kettle (4½ h.p. B.S.A.) leaving the checking station at Kilmacanogue.

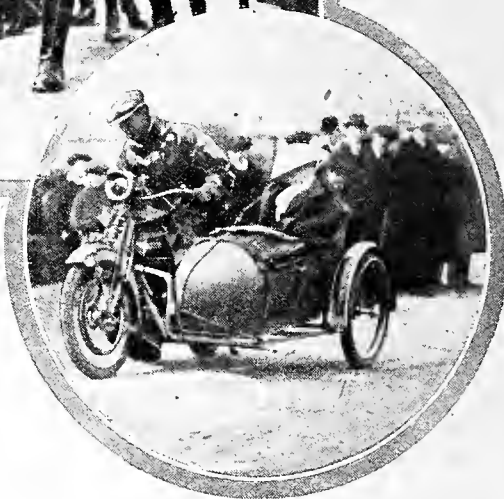
**T**HE opening competition of the season of the Dublin and District Motor Cycle Club was held on Friday last, St. Patrick's Day being a Bank Holiday in Ireland. After a long spell of exceptionally bad weather, it was a pleasant change to find the conditions agreeable for motor cycling, although the roads were very heavy in parts.

The route was a relatively short and easy one, to Glendalough and back, and with two hours' interval at the turning point and no secret checks to worry one, the trial was not of an arduous character. Out of an entry of fourteen, twelve riders competed. The conditions of the trial required the competitors to make non-stop runs between each of the three sections into which the course was divided. The only one of these that gave trouble on the outward journey was between Kilmacanogue and Mountain Stage Tavern, this section including the ascent of the Sugarloaf from the Rocky Valley. The road was so greasy that some of the solo riders came over, while Kettle (B.S.A. sc.) had an involuntary stoppage to adjust a throttle wire. Most of the competitors were on time at Glendalough. The return journey was easier, being by the Vale of Clara, Rathnew, Newtownmountkennedy, and Bray, and of those who checked in at Glendalough the following reached the finish:

R. Arm-trong (8 Enfield sc.)	L. Carter (7-9 Excelsior sc.)
R. Fennell (4 Norton sc.)	D. Allen (2½ Sun)
J. McKenzie (5 Indian sc.)	M. Keegan (3½ Triumph)
T. Morrogh (2½ Douglas)	S. Allen (3½ James)
P. Hurse (4½ B.S.A.)	P. H. Morrogh (2½ Douglas)
S. Redmand (3½ Indian)	

## CORK TO DUNGARVAN.

The Cork and District M.C.C. took advantage of the Irish Bank Holiday on Friday last to open their competitive season. The event was a reliability trial to Dungarvan and back, and a field of twenty-four turned out for the event. The weather was mild and springlike, in striking



contrast to the Arctic weather recently experienced. Of the two dozen competitors the following eighteen completed the journey:

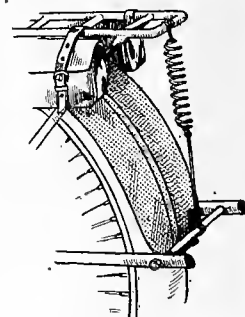
H. Lester (6 A.J.S. sc.)
Lt. M. Sullivan (3½ Sunbeam)
D. Lucy (2½ Douglas)
R. Perico (2½ Douglas)
J. Gibbins (2½ A.J.S.)
E. O'Sullivan (3½ Triumph sc.)
C. Neff (7-9 Harley-Davidson sc.)
C. S. Hostford (4 A.J.S. sc.)
P. J. Frost (6 Enfield sc.)
F. L. Dooley (4½ B.S.A.)
C. B. Franklin (7-9 Indian sc.)
L.-Cpl. Walsh (4 Triumph)
P. J. O'Hea (7-9 Indian)
E. MacSweeney (6 Sunbeam sc.)
E. Creagh (6 A.J.S. sc.)
J. Atkinson (3½ Ariel sc.)
J. Murphy (7 Indian sc.)
M. P. Lawton (3½ Triumph)

As most of the competitors secured full marks, the awards and placings will depend on the variation from schedule time at the various checking stations.

## Norton Extensions.

The new works of Norton Motors, Ltd., are now in process of occupation, and all correspondence intended for this firm should be addressed to Philips Street, Aston, Birmingham.

## A WAR ZONE FITTING.



Back stand clip, consisting of spring from stand to carrier, fitted to a military Douglas by Cpl. H. R. Willoughby, R.E.

# "THE MOTOR CYCLE" RECRUITING SECTION.

## Central Office for Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

## Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

**R**ECRUITING for the Motor Machine Gun Service is still brisk, the applications hitherto having exceeded the vacancies. More batteries having left for active service, there is further accommodation at the training centre, and this week it was expected that another large batch of motor cyclists and car drivers would be enrolled.

On Tuesday afternoon Mr. Geoffrey Smith, editor of *The Motor Cycle*, was to test in Coventry about a hundred recruits, yesterday (Wednesday) he was due in Nottingham for the same purpose, and on Saturday afternoon next, the 25th inst., he will be in London (at *The Motor Cycle* Offices, 20, Tudor Street, London, E.C.) to accept suitable men who have made application in and around the Metropolitan area.

Suitable applicants from the London district have been notified to attend, and it may be impossible to see all the others who may present themselves.

Only experienced motor cyclists and car drivers may be accepted at present. Applicants must be of good physique, possess good eyesight, and be medically fit for service abroad.

The conditions of enlistment are:

Pay 1s. 2½d. per day, all found.

Enlistment for duration of war.

Usual separation or dependants' allowance.

Age limits, 19 to 40.

## Latest M.M.G.S. Recruits.

A list of recruits accepted last week is appended.

Adams, S. J., Ware.	Lowson, A., Dundee.
Adamson, G. J., Cupar, N.B.	Lyne, E. C., Hove.
Andrew, A. W., Tenbridge.	Malpass, C. T., Raynes Park.
Barracough, H., Coventry.	Manser, G., London.
Beattie, B., South.	Meade, J. V., Barking.
Benson, W., Peterborough.	Merry, J. P., Salisbury.
Bissett, G. H., Dundee.	Miller, B. G., Falkirk.
Blackmore, G. M., Southsea.	Milne, H., Rochdale.
Bradford, F. J., Wolverhampton.	Moore, F., Halifax.
Clayton, O., Great Harwood.	Naylor, G., Harwood.
Coles, J. J., Westgate-on-Sea.	Newington, W., Wadhurst.
Colquhoun, J. W., Bootle.	Nixon, H., Grimsby.
Crummie, J., Hull.	Phillips, C., Chesham.
Dawson, W. T., Boston.	Powell, R. J., London.
Dean, G. E., London.	Raven, F., Greenford.
Dyer, F., Curry Rivel.	Raynor, F., Grimsby.
Edwards, W. C., Coventry.	Reed, R. S., Evercreech.
Elliott, A., Hull.	Rivers, G., South Molton.
Evans, E. T., Maesteg.	Roberts, A. L., Leicester.
Fibbens, C., Woking.	Rosenthal, A. A., Nottingham.
Firth, F. S., Grimsby.	Ross, A., Seaforth.
Fisher, R. H., Reepham.	Sykes, E., Bournemouth.
Fuller, F. W., Carshalton.	Taylor, P. A., Ebbw Vale.
Gloyn, C. F., Plymouth.	Thompson, A., Northwich.
Graham, W. F., Tamworth.	Thornhill, H., Derby.
Grewcock, G., Barwell.	Tomkins, A. T., Coventry.
Griffiths, F. J., Birkenhead.	Trickett, D., Coventry.
Hawgood, A. A., Derby.	Utting, R. A., King's Lynn.
Haywood, D. H., Bengeworth.	Weatherall, F. W., London.
Hibbens, C., Huntingdon.	Weatherill, W. G., Blackhill.
Hood, B. J., Bath.	Webby, J., Yeovil.
Husbands, A., Tonypandy.	Williams, A. E., Manchester.
Jacobs, H. W., Bristol.	Williams, T., Bootle.
Johnson, C., Warr.	Williams, T. J., Ebbw Vale.
Jones, A. W., Bargoed.	Winter, D., A.
King, W. R., Wishaw, N.B.	Witter, H., Southport.
Kirby, F. A., Norwich.	Witty, J. A., Leeds.
Kitson, J., Bradford.	Woods, R. D., Derby.
Lawn, H., Thirsk.	Woolmer, G. G., Royston.
Lawson, A., Darvel.	Yallop, R. R., Norwich.
Lee, L., Stockingford.	Yates, H. I., Blackpool.
Leeming, C. H., Walsall.	Zimmerman, H., Hull.

Among the above were a number of men originally passed for the R.E. signal service, besides a number of married men who had not previously attested.

On this page an application form appears which should be used in preference to old ones. Readers should fill in each item carefully, but replies cannot be issued for a day or two owing to the mass of correspondence—much of it quite unnecessary if only the notes and instructions on this page were attended to. The vacancies are for immediate service only.

The next inspection of recruits in the Midlands is on Tuesday next, the 28th inst., at the Recruiting Office, Masonic Buildings, Coventry.

A number of applications have been received from Scotland, Ireland, and Guernsey. Motor cyclists living at a long distance from Coventry would do well when applying to enclose two testimonials as to their driving ability, if they wish railway warrants to be sent to them without delay and further correspondence.

The Editor regrets that several applications from motor cyclists were received too late to permit an interview before the writers were due to report themselves under the Group system.

Three months' riding experience is not considered sufficient experience for the M.M.G.S. One applicant who stated that he had had nine years' experience did not know the make of carburetter on his machine, nor could he give any reasons for falling off in power in an engine. Another with "three years' experience" talked of his Rex machine being fitted with a twin-cylinder two-stroke J.A.P. engine!

A goodly number of applications for transfers from other units have been received, but these must stand over for the present. It may save needless correspondence if it is mentioned that transfers from Territorial regiments are impossible.

## APPLICATION TO JOIN THE MOTOR MACHINE GUN SERVICE.

Name .....

Address .....

Chest measurement ..... Height .....

Group No. ....

or Age .....

Class No. ....

How long have you been a motor cyclist? .....

Can you execute running repairs? .....

Are you fit for overseas service? .....

Occupation .....

When are you called up? .....

WHAT DATE COULD YOU JOIN? .....

After filling in the above particulars return to:

MR. GEOFFREY SMITH,  
Inspecting Officer,  
19, Hertford Street,  
COVENTRY.

[Issue March 23rd, 1916.]



## TIME TO LIGHT LAMPS

GREENWICH TIME.

March 23rd	...	6.46 p.m.
" 25th	...	6.49 "
" 27th	...	6.52 "
" 29th	...	6.55 "

### The Soldier's Razor.

Owing to difficulty in obtaining Army razors, an Army Order issued last week states that all men joining from March 20th onwards will be given an allowance of 2s. in lieu of the issue in kind of a razor.

### Bromley Trap—War Office Victim.

Amongst victims of the Bromley, Kent, trap (still being worked up to 8 p.m.) was a staff officer at Whitehall and a Catford lady motor cyclist, Mrs. Leng. The latter informed the constable that this was the first time she had been stopped after 10,000 miles. Fined 40s.

### A Sidecar Race in Victoria.

The Victorian M.C.C. held a sidecar race, in which there were seven starters. Results on handicap were:

1. H. McCall (6 h.p. J.A.P.). Time 1m. 16½s.; handicap 20s.
2. S. Nunan (7 h.p. American Excel-sior). Time 1m. 9½s.; handicap 8s.
3. P. Priestley (7 h.p. Ideal J.A.P.). Time 1m. 2½s.; scratch.

### Another War Zone Newspaper.

*On Service* is the latest journal published behind the firing line in France, and judging by the first number, a copy of which we have received, it strikes a higher note than similar publications. Lt. S. A. Rowlandson is the editor, and it appeals mainly to men in the Mechanical Transport at G.H.Q. The following extracts are very amusing:

Did the old soldier expect us to believe him when he said his worst experience was when he was end man on the British front of 300 miles, and the order came "Left form," and having to mark time for three weeks?

#### From "Answers to Correspondents":

CRL. F.—Many thanks for your article on "A Transport of Delight." Our paper, being so clean, we cannot print it—besides we could not possibly allow nineteen split infinitives in 450 words.

FANCIER.—You are quite wrong. G.H.Q. is not a dog's home.

Interest is added to the foregoing, when it is remembered that the replies are published in the first number.

We wish *On Service* every success, also the gallant fellows on whose behalf it is compiled.

## SPECIAL FEATURE

OVERSEAS TRADE.

::

AMATEUR REPAIRING.

THE CYCLE CAR OF THE FUTURE.

### Well-known Motor Cyclist Interned.

Many of our readers will remember Basil Vickers-Jones, the rider of a Premier twin, who put up such notable performances in Tourist Trophy Races of the past. Vickers-Jones was considered one of the finest cornerists of the day when the short triangular course in the Isle of Man was used. After retiring from Tourist Trophy and other events he took up an important position with the Premier works in Bavaria, and was interned on the outbreak of war. We had the pleasure of receiving a communication from Mr. Vickers-Jones last week, who wrote on behalf of several other engineers boxed up in an internment colony in Raabs on the Thaya, Lower Austria, expressing their displeasure in getting very behindhand in the matter, which used to be their profession. He begs us to forward a bundle of copies of *The Motor Cycle* and *The Autocar* to enable them to keep themselves up to date. On the day Mr. Vickers-Jones wrote he mentions that they had been speaking of setting on foot an "engineers' reunion," so as to keep their minds a little fresh. He goes on:

"We are altogether about sixty English in Raabs. There are also many others in the neighbouring villages. We have a full-blown 'university.' Besides being able to learn many languages, we also have very interesting lectures, etc. Mr. Campbell-Taylor, of the Daimler Co., is at present giving a course on 'Motor Car Design and Construction.'"

### The Active Service Press.

The advent of *On Service* shows that the popularity of the newspapers published, and in many cases printed also, just behind the firing line in France, is on the increase. Offhand we can recall the following published by the British:

*The Strafer.**The Listening Post.**On Service.**Our Mag.*

### Hind Cars.

We have forecars and sidecars in this country, and the Americans have lately gone a further step by introducing a "hind car." It is a sort of trailer permanently connected to the rear of the bicycle. Several such vehicles were tried in England many years ago. We recollect trying one made by Mr. G. Hilton, of Rugby, in 1904. The bicycle was a 2½ h.p. chain-driven Humber with a sloping engine.

### Bad Roads in the War Zone.

One result of recent snow and rain has been to make the roads in the war zone on the Western front (which are none too good at any time) in a shocking condition, and despatch riders have been having a far from cheerful time of late on this account. Cpl. Howard Lane, a former prominent member of the Sutton Coldfield M.C.C., tells us that the results now being obtained under such trying conditions from motor cycles are wonderful.



G. S. Oboukhoff in uniform, and mounted on a Williamson sidecar outfit. He is a pioneer motor cyclist of Russia, and holds several records. Mr. Oboukhoff has the Singer and Williamson agency for the Moscow district, and after the war intends visiting England on business.

**Our Spring Number.**

A ladies' feature will be included among the special articles in preparation for *The Motor Cycle* spring number on April 13th next.

**Army Motor Cyclists.**

A record number of recruits were expected for the Motor Machine Gun Service this week.

**Brisk Overseas Demand.**

The demand for British-made motor cycles from abroad is far greater than our manufacturers can cope with under the present war conditions.

**British Exports.**

Manufacturers relate in this issue the difficulties with which they have to contend in exporting motor cycles Overseas. The Board of Trade have the matter in hand, and an improvement in the existing conditions is confidently expected as a result of the experiences detailed.

**The National War Funds.**

At the week-end the principal relief funds stood as follow:

The Prince of Wales's National Relief Fund (£3,073,000 distributed) .. .. .	£5,827,874	0	0
Tobacco Fund .. .. .	102,134	0	0
Fund for the Sick and Wounded .. .. .	3,514,280	0	0
The Queen's Work for Women Fund .. .. .	168,713	6	10
Polish Victims' Relief Fund .. .. .	121,708	0	0

**Through a Foot and a Half of Snow.**

During the recent snow a draft of despatch riders, fifty in number, left for Devonport, a distance of 250 miles, in the charge of two artificers. After sixty miles had been covered one of the machines seized, and the artificers had to remain with it. The rest continued their journey, but being informed ten miles further on that the road was impassable for a distance of eight miles owing to snow 18in. deep, they took another route. Later the artificers, having repaired the machine, and not being warned of the snow, made their way through it, but with difficulty. One of these men is a well-known track rider. Their experiences should make interesting reading.

**The Position of the Private Owner.**

The official crusade against motoring and motorists continues, while cinema shows and many other means of sending money out of the country are let alone. "Don't use your car or motor cycle for pleasure during war time," says the latest official poster, but the amount of evidence that we have collected which shows what motorists are doing and how little purely joy-riding is indulged in is stupendous, and we can only hope that when this is summarised and placed by the R.A.C. and A.C.U. before the Government departments concerned the attitude of the latter will undergo a very decided change. Again we urge our readers to do all they can to help their country, and to enjoy the use of their machines for *recreative purposes* as little as possible, but that they should lay by their machines altogether would, we think, be unwise and unprofitable. The position of the motorist has undergone no change up to the time of writing, and we do not anticipate any official announcement until the Budget appears in the first week of next month.

**Motor Cyclist Airman Missing.**

We regret to learn that Sec.-Lt. M. A. J. Orde, R.F.C., son of Mr. J. W. Orde, secretary of the R.A.C., is missing.

**The Impressive Sight of Motors.**

According to the special correspondent of *The Times* the Portuguese Minister in Berlin, Senhor Sidonio Paes, remarked upon his arrival in Paris that it was a pleasant change after Berlin. "Motor cars circulate freely, and the whole spirit of the nation is very different from what I had been led to expect."

**Resignation of Sir William Goff.**

We are informed that Sir William Goff, Bart., D.L., J.P., one of the original directors of the Dunlop Rubber Co., has resigned his seat on the board. Sir William has been Chairman of the Irish Automobile Club, and an active pioneer of motoring in Ireland.

**N.S.W. Motor Cyclist Recruits.**

Fred S. Roberts, who came from Sydney, N.S.W., last summer to enlist in the M.M.G.S., is now a sergeant in the 25th Battery. Du Bois being a friend of Roberts, the last-named was naturally particularly interested in the experiences of du Bois on the *Möwe*, recorded in the last issue of this journal.

**IMPORTS OF CARS AND MOTOR CYCLES TO BE PROHIBITED.**

It will come as no surprise to those readers who have closely watched the course of events to learn that the British Government has decided to place a ban upon the importation of motor cars for private uses. The term "Motor Cars," of course, includes motor cycles within the meaning of Government Acts. Cars and motor cycles are not the only articles affected by this new order, and it is understood that the ruling will apply equally to all countries, including the British Dominions and Colonies.

**A Sad Accident.**

The fatal accident to the Rev. Thomas Francis Stewart, a member of the Hartlebury College of Clergy, and formerly vicar of St. Paul's, Worcester, whilst motor cycling in Worcestershire, is very sad. He was a well-known man locally, and had only recently returned from a year's service as naval chaplain.

**A Proposed New Speed Limit.**

A ten miles per hour speed limit order has been applied for in respect of roads at Smethwick and West Bromwich. Motor cyclists able to assist the Automobile Association in opposing the order are invited to communicate their views to the secretary at Fanum House, Whitcomb Street, W.C.

**The New Taxes.**

All sorts of forecasts are being indulged in as to the attentions of the Chancellor of the Exchequer toward motorists in his new Budget. It has been stated that the existing taxes will be doubled. Whilst it is hoped that the new taxes may not prove so severe, car owners as well as motor cyclists must be prepared for an increase to help to pay for this costly war.

**Average Prices OF Second-hand Machines.**

From "The Motor Cycle" of March 16th, 1916.

Make	Year	H.P.	Average for last week.	Latest weekly average obtainable
A.J.S. ....	1915	3-sp. sidecar ..	£82	—
" .....	1914	6 3-sp. sidecar ..	—	£72
" .....	1913	6 3-sp. sidecar ..	—	£48
" .....	1912	6 3-sp. sidecar ..	—	£44
" .....	1915	2 3-speed .....	—	£46
Allon .....	1915	2 2-stroke .....	£32	—
" .....	1916	2 2-stroke .....	£36	—
Ariel .....	1914	3 3-sp. sidecar ..	—	£53
" .....	1913	3 3-sp. sidecar ..	—	£44
Bradbury ..	1914	6 3-sp. sidecar ..	—	£63
" .....	1914	4 3-sp. sidecar ..	£41	—
B.S.A. ....	1915	4 3-sp. sidecar ..	£70	—
" .....	1914	4 3-sp. sidecar ..	£50	—
" .....	1913	3 2-sp. sidecar ..	—	£44
" .....	1915	4 3-speed .....	—	£50
" .....	1913	3 2-speed .....	—	£32
Calithorpe ..	1915	2 2-speed .....	£26	—
" .....	1914	2 2-speed .....	—	£16
Clyno .....	1914	6 3-sp. sidecar ..	—	£63
" .....	1913	6 3-sp. sidecar ..	£51	—
Douglas .....	1915	2 3-speed .....	£46	—
" .....	1915	2 2-speed .....	£45	—
" .....	1914	2 2-speed .....	£34	—
" .....	1914	2 2-speed T.T. ..	—	£35
" .....	1913	2 2-sp. kick start ..	—	£32
" .....	1913	2 2-speed T.T. ..	—	£29
" .....	1913	2 2-speed .....	—	£31
Enfield .....	1915	6 2-sp. sidecar ..	£70	—
" .....	1916	6 2-sp. sidecar ..	—	£69
" .....	1914	6 2-sp. sidecar ..	£58	—
" .....	1913	6 2-sp. sidecar ..	£49	—
" .....	1915	3 2-speed .....	£39	—
" .....	1914	3 2-speed .....	—	£33
A. Excelsior ..	1914	7 2-sp. sidecar ..	—	£55
H.-Davidson ..	1915	8 3-speed .....	£67	—
" .....	1915	8 3-sp. sidecar ..	£74	—
Henderson ..	1915	4-cyl. sidecar ..	—	£80
Hobart .....	1915	2 2-speed .....	—	£29
Indian .....	1915	7 3-sp. sidecar ..	£73	—
" .....	1915	7 T.T. ....	—	£43
" .....	1914	7 2-sp. sidecar ..	—	£55
" .....	1914	7 2-speed .....	—	£44
" .....	1914	7 T.T. ....	—	£44
" .....	1915	5 3-sp. sidecar ..	£62	—
" .....	1915	5 3-speed .....	£50	—
James .....	1915	4 3-sp. sidecar ..	£61	—
" .....	1913	4 3-sp. sidecar ..	—	£40
Lea-Francis ..	1915	3 3-speed .....	—	£63
Levis .....	1915	2 1/2 de Luxe .....	—	£37
" .....	1915	Popular .....	£23	—
Matchless ..	1915	8 3-sp. sidecar ..	—	£80
" .....	1914	8 3-sp. sidecar ..	—	£74
" .....	1913	8 2-sp. sidecar ..	£49	—
New Hudson ..	1915	6 3-sp. sidecar ..	£61	—
" .....	1915	2 2-speed .....	£24	—
New Imperial ..	1915	2 2-speed .....	£27	—
" .....	1914	2 2-speed .....	—	£25
O.K. ....	1915	2 2-speed .....	—	£30
" .....	1914	2 2-speed .....	—	£21
P. & M. ....	1914	3 2-sp. sidecar ..	£60	—
" .....	1913	3 2-sp. sidecar ..	—	£43
" .....	1913	3 2-speed .....	—	£40
Premier .....	1914	3 3-sp. sidecar ..	—	£48
" .....	1913	3 2-sp. sidecar ..	—	£32
Quadrant .....	1915	4 3-sp. sidecar ..	—	£60
" .....	1914	4 3-sp. sidecar ..	—	£66
Rex .....	1914	6 2-sp. sidecar ..	—	£48
" .....	1913	6 2-sp. sidecar ..	£38	—
Rover .....	1915	3 3-sp. sidecar ..	£63	—
" .....	1914	3 3-sp. sidecar ..	£43	—
" .....	1913	3 3-sp. sidecar ..	—	£37
Rudge .....	1915	5 Multi sidecar ..	—	£41
" .....	1914	3 Multi sidecar ..	—	£38
" .....	1915	3 Multi T.T. ....	—	£38
" .....	1914	3 Multi .....	—	£36
" .....	1913	3 Multi .....	—	£28
Scott .....	1914	3 2-sp. sidecar ..	£48	—
" .....	1913	3 2-sp. sidecar ..	—	£42
Sunbeam .....	1915	6 3-sp. sidecar ..	—	£66
" .....	1914	6 3-sp. sidecar ..	—	£74
" .....	1915	3 3-sp. sidecar ..	£69	—
" .....	1915	3 3-speed .....	—	£63
" .....	1914	3 3-speed .....	—	£52
Triumph .....	1915	2 2-stroke .....	—	£36
" .....	1914	4 3-sp. sidecar ..	£46	—
" .....	1914	4 3-speed .....	£45	—
" .....	1913	3 3-sp. sidecar ..	£46	—
" .....	1913	3 3-speed .....	£31	—
Williamson ..	1914	8 2-sp. sidecar ..	£50	—
" .....	1913	8 2-sp. sidecar ..	—	£55
Zenith .....	1911	8 Gradua sidecar ..	—	£67
" .....	1914	6 Gradua sidecar ..	—	£52
" .....	1913	6 Gradua .....	—	£53



## Motor Machine Gun Batteries.

OUR photographs are of two new batteries of the Motor Machine Gun Service, ready for active operation in the great war against the common enemy. The upper photograph shows the 22nd Motor Machine Gun Battery, the lower, picture the 4th Light Armoured Motor Battery, whose equipment consists of armoured cars with motor cycle mounted infantry supports. The M.M.G.S., which is now a branch of the Machine Gun Corps sanctioned last year by His Majesty the King, has lately been extended, and embraces all kinds of mobile machine guns.





## 22nd MOTOR MACHINE GUN BATTERY.

Motor bicyclists, sidecarists, and car drivers form the *personnel* of this comparatively new arm of the Service.

The formation of the sidecar batteries is eighteen Vickers-Clyno sidecars (in three sections), a sidecar outfit for the commanding officer, Triumph motor bicycles for the use of the section commanders and an orderly, and five transport cars.

Vehicles of the Light Armoured Motor Batteries, the newest and most up-to-date motor section of our gallant Army, consist of motor bicycles, armoured cars, transport vehicles, and repair lorries.

The excellent stamp of men forming the M.M.G.S., drawn from the ranks of young and sporting motor cyclists and car drivers, has many times evoked the praise of the commanding officer, Lt.-Col. R. W. Bradley, D.S.O., and already a number of men have gained special awards for conspicuous gallantry in the field.

It will be recalled that Viscount French, the Commander-in-Chief of the Home Forces, recently paid a visit of inspection to the training centre of the M.M.G.S., and at the same time decorated two men for distinguished services.



## 4th LIGHT ARMOURED MOTOR BATTERY.

O.C., Capt Scriven,  
on his right Lieut.  
A. R. Gurney, on his  
left Lieut. W. T. C.  
Barnes.

*Photographs by  
H. R. Gwyer  
Gibbs, specially  
for "The Motor  
Cycle."*

## ANOTHER MOTOR CYCLIST AIRMAN KILLED.

**W**E learn with extreme regret that Graham Price, the well-known private owner competitor rider of Bat motor cycles, who was attached to the Royal Flying Corps, has met his death during a fight in the air with an enemy aeroplane. Like so many brave motor cyclists, he became an expert pilot, and, like so many others, alas! he has gone to swell the ever-increasing motor cyclists' roll of honour.

Graham Price was a keen competition rider, and his name often figured in the principal events in 1914. In the last London to Edinburgh run he gained a gold medal for the double journey on a 5 h.p. Bat and sidecar. Riding a similar mount solo in the Scottish Six Days he experienced bad luck, and retired on the second day; but in the English Six Days, when he again rode a solo machine, he earned a gold medal.

In the early days of the war Price joined the R.E.'s, as a despatch rider, and was in the famous retreat from Mons. It was only at the early part of this year that he obtained his commission in the R.F.C., and it was only a short time ago that we heard of this aviator attacking at the same time three Fokker and two other enemy aeroplanes. His parents have received a personal telegram from the King condoling with them in their loss.

An officer in the Dublin Fusiliers who served for twelve months in France as a despatch rider with poor Price pays a high tribute to his qualities as a soldier. This writer considered him to be by far the most efficient despatch rider he had ever come across, and the best friend and comrade one could wish for. He had a peculiar genius as a motor cyclist.

Another example of his fine character was shown by a letter he recently sent to his mother, in which he said: "If I am killed do not grieve for me, but feel proud that you had a son to give in the country's cause."

It is sad to think that when the next important motor cycle trial is held many familiar faces will be missing.

## CORK CLUB'S TRIAL.

**A**T the moment of going to press we have received results of the Cork and District M.C.C. Irish Bank Holiday trial, a brief report of which appears on page 278 of this issue, the figures in brackets denoting the number of marks lost:

**FIRST CLASS AWARDS.**—D. Lucy (0), F. L. Dooly (1), Lt. M. Sullivan (2), C. S. Hosford (2), A. Lester (3), P. J. O'Hea (3), E. Creagh (3), J. Gibbins (4), C. B. Franklin (4), P. J. Frost (5), E. MacSweeney (5).

**SECOND CLASS AWARD.**—C. Neff (9).

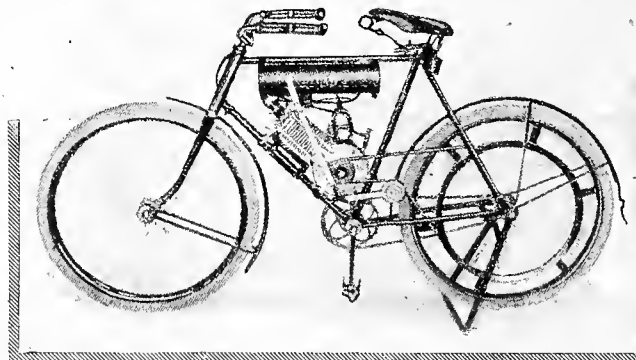
**THIRD CLASS AWARDS.**—R. Perico, L.-Cpl. Walsh, J. Atkinson, J. Murphy.  
**NEW HUDSON CHALLENGE CUP.**—D. Lucy.

**NOVICE PRIZE.**—E. Creagh.

**TEAM PRIZE.**—D. Lucy, J. Gibbins, and R. Perico.



The late Flight Lieut. Graham Price, as he appeared in his last motor cycle trial—the A.C.U. Six Days of July, 1914, and as a despatch rider. He was later granted a commission in the Royal Flying Corps.



The 2½ h.p. single-cylinder four-stroke Shaw motor attachment

## AN HISTORIC COPY OF "THE MOTOR CYCLE."

**W**E have received from Sgt. James H. Lauder, of the 1/3rd Lowland Field Ambulance, a copy of the last Buyers' Guide issue of *The Motor Cycle* that has quite a history attached to it. Sgt. Lauder tells us that the particular copy of the paper reached him while on duty not far from the front line two or three days before the evacuation of Cape Helles. On the last night—which will never be forgotten by those who passed through it—it was brought away with the last personal belongings.

The experience of our publishing department is that the Buyers' Guide number is the issue of the whole year for which there is the greatest demand, both at the date of publication and afterwards. But, however insistent and tempting the demand for copies of the issue of November 25th, 1915, may be, we shall retain such a famous copy as the one sent us by Sgt. Lauder.

Our correspondent was at the time of writing in Egypt, and he is very enthusiastic concerning motor cycling around Cairo, where there are some good roads.

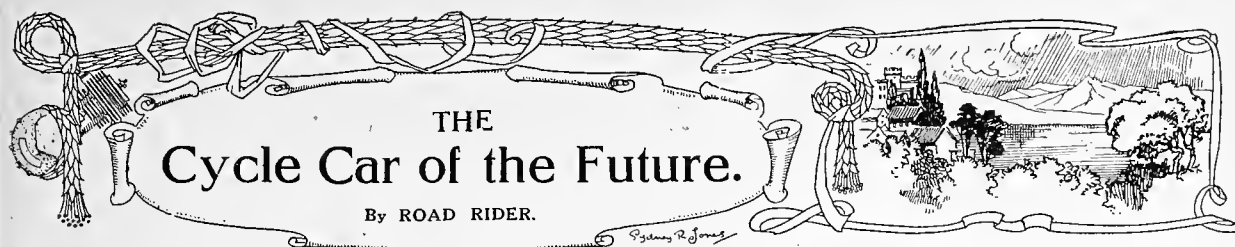
## THE SHAW MOTOR ATTACHMENT.

**M**OTOR attachments for pedal cycles have always been attractive to a section of the community, and many and varied have been the different types devised for meeting the demand. One of the latest is known as the Shaw; it hails from America, and the agency in England has been taken up by Messrs. Bramco, Ltd., of Ellys Road, Coventry.

This outfit consists of a 2½ h.p. four-stroke single-cylinder engine which clamps to the down tube of an ordinary pedal cycle. A belt rim is supplied which has to be attached to the rear wheel of the cycle, the power then being transmitted by means of a round leather belt over a jockey pulley, by means of which the belt tension may be slackened, so allowing it to slip, enabling a free engine effect to be obtained. Shaw outfits can be obtained with either magneto or battery ignition.

The speed is controlled by the twist grip method, so popular in America. A small cylindrical tank over the engine contains the petrol and oil, there being sufficient for a journey of about seventy-five miles, the lubricant being supplied to the engine *via* a drip feed. It is claimed that speeds ranging between 4 and 35 m.p.h. can be obtained, but we should think that an ordinary cycle ridden at 35 m.p.h. without spring forks would not be particularly pleasant.





I HAVE a sturdy belief in the ultimate future of cycle cars and still drink to "der Tag," even though I was not amongst those who fancied that their day had come two or three years ago, when violent and premature attempts were made to persuade the trade and public that the lighter branches of motor engineering were already in a position to establish a new industry. I have faint, but sincere, hopes that the oft-promised and long-delayed economical four-wheeler on motor cycling lines is near at hand. The war has made our designers and factories less groovy and stereotyped in their outlook. It has distributed those ideals of lightness which are an essential feature of aviation work. Above all, the debts which war will leave have impoverished the nation for at least a generation and will bequeath a compulsion towards economy which the trade will be forced to respect. Therefore many of our less conventional engineers are thinking cycle cars, and a fresh boom—possibly premature, possibly sensible—is quite likely to succeed the arrival of peace.

This being so, there are one or two factors, easily overlooked on the drawing desk, which I should like to emphasise.

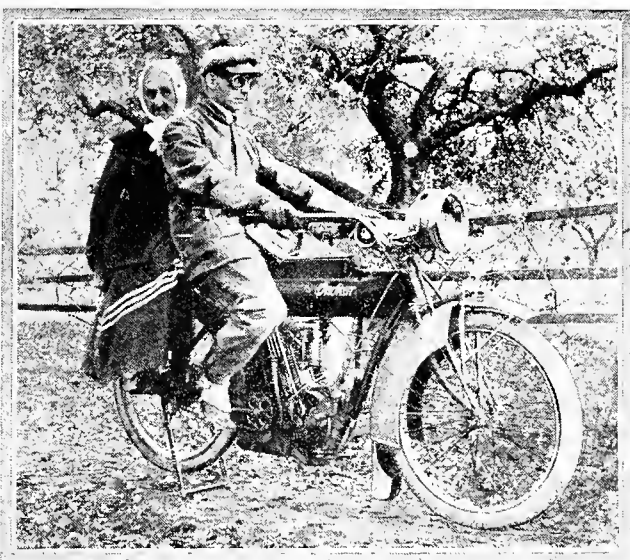
#### What Designers must Avoid.

Previous cycle cars have been great sinners in respect of vibration. To this general statement there are hardly any exceptions. The man of moderate means will put up with a good deal of vibration, Motor bicycles vibrate—especially if the frame be rigid, the speed high, and the road a war-broken British highway of to-day. But the average premature cycle car vibrated more than any motor bicycle, partly because its chassis was imperfectly sprung, partly because its engine belonged to one, or other of those classes which are grossly unbalanced, especially when running free. The car—light or heavy—has created a very high standard for four-wheelers in this matter; and a cycle car which aspires to lead a boom must be genuinely free from unreasonable vibrations, whether arising from road or engine. The problem is easier than it looks. Light chassis can be properly sprung, e.g., the Baby Peugeot. Small air-cooled engines can be decently balanced, e.g., the Douglas and the big Williamson.

Secondly, cycle cars of the past were mostly rather hot and smelly. Their air-cooled engines were usually mounted in front, and being air-cooled reached a high temperature. Being left uncovered for cooling purposes, they were seldom clean. A traction-engine sort of smell assaulted the occupants' nostrils almost permanently. Both motor bicycles and motor cars create somewhat similar odours, but not to the same extent, and in these two cases the odour is trailed behind, and the users escape it.

Thirdly, the passengers of past cycle cars cannot "see over the hedge," a fault with which the sidecar passenger can sympathise. Admittedly, some of the finest scenery in the British Isles is hedgeless. The sides of mountain roads are usually unfenced, and it does not then matter whether the passenger's eye-level is 3ft. or 6ft. above road level. But in all the tamer and most frequented counties the hedges are high enough to shut off all the surrounding landscape from a person seated in the average sidecar or cycle car, and nothing is duller than being driven interminably between two walls of green. This problem is difficult of solution, as light weight demands a low centre of gravity if the vehicle is to be safe. Some people will say that the vogue of the sidecar proves that low seating does not matter. I am of rather a different opinion. The sidecar scores because it is detachable and cheap. The cycle car will always have to reckon with the competition of the light car, and will be weighed in the balance with it. If cycle car occupants are seated unduly low, potential purchasers will always be meditating "For another £50 I could get a light car," or "I wonder if I couldn't pick up a decent second-hand light car for the same money," and in the early days of the cycle car boom, when it really comes, the movement will need all available support.

I believe that all the three points raised in this article are vital to a successful resuscitation of the—shall we say "defunct" or "hybernating" or "moribund" cycle car movement.



ANOTHER RECORD—PILLION RIDING AT 92!  
A Warren, Ohio, U.S.A., lady, who, at the age of 92, enjoys trips mounted on the carrier of a motor cycle.





The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

#### Unfit for Service.

Sir,—I was very pleased to read your leader in *The Motor Cycle* of the 2nd inst., as it is time something was found for those who are slightly unfit.

Take my case. I am 24 years of age, with over six years' experience as a cycle mechanic, can ride a motor cycle, and have some small knowledge of repairing, and have been rejected on account of defective eyesight. Knowing that my eyesight was not of the best, I tried for the R.A.M.C. in November last, and was rejected, and as far as things go at present I am apparently of no use. However, I think I could be of some use in some things, such as the A.O.C. or the R.N.A.S. workshops.

R.M.P.

#### Aluminium Pistons for Two-strokes.

Sir,—I would like to add a little evidence to your very interesting article on the subject of the use of aluminium for pistons for two strokes.

I have conducted many experiments with the use of aluminium on other parts as well; but I had one case of an engine running on a semi-Diesel forced induction system in which it was practically impossible to use a top ring on the piston at all unless the latter was constructed of aluminium and ribbed inside for cooling. The engine was a four-stroke model, but it is a very excellent proof that aluminium pistons for two strokes are of value particularly where the surface is rather large in relation to the volume, on machines of large capacity.

It is possible to alloy aluminium with many other metals, and to increase hardness without materially affecting its conductivity, but the greatest care is necessary to ensure that the exact composition of the "aluminium" is known when purchased, and there are many precautions which are essential after casting and during the process of pouring into whatever special mould is chosen.

A. M. Low, A.C.G.I., D.Sc., etc.

#### Derby Groups and the M.T., A.S.C.

Sir,—I am writing to ask you if you are aware if there is any truth in the rumour, which has gained considerable currency, that men of the Derby groups, attested and signed on for the M.T., A.S.C., will only receive the minimum rate of pay, instead of 6s. per day, as hitherto. If such is the case, it appears that married men like myself, willing to do their share, will have to suffer in more ways than one, besides being called to the Colours prematurely, though at the same time they may be fully qualified for the full rate of pay which numbers of single men already enjoy.

I may state I have been a regular reader of your valuable paper for the past eight years, and devour its interesting columns from beginning to end.

GROUP 40.

[The fact of men specifying any particular section at the time they were attested does not necessarily mean that they are drafted to that section on being called up. It is only in case there are vacancies that this can be done. It was announced some weeks ago in Parliament that the 6s. per day rate would not be paid in future to Army Service Corps men. The present rate of pay is 1s. 2d. per day for learners, this amount being doubled on the driver becoming proficient. The new decision has been announced in the pages of *The Motor Cycle*—see issue for January 6th.—Ed.]

#### Paraffin as a Fuel.

Sir,—After reading H. S. Wallis's letter in your valuable paper of March 2nd, I set about making my machine suitable for the use of paraffin. In the meantime *The Motor Cycle* of March 9th came to hand, and I read this passage from the letter of T. H. Ward: "To use paraffin in an ordinary high-class motor engine is sheer abuse. After a few months running every part of the engine will be badly worn." Mr. Wallis says a B.S.A. ran 1,000 miles on paraffin. He then took it down, and found it to be in splendid order. Now, sir, as a working man who feels the pinch of petrol at 2s. 6d. per gallon, and being afraid of spoiling my engine, I hope someone who knows what paraffin is will tell us in as simple language as possible why paraffin is bad for engines.

A POOR MAN.

Sir,—Seeing T. H. Ward's letter in your correspondence columns has led me to give my experiences with paraffin.

My machine is a 2½ horizontally-opposed engine, which has been running perfectly for nearly a year. Faced by the increased price of petrol, I bethought me of paraffin, which I first tried, without any alteration to the carburettor, in the proportion of 1 to 1 (½ gal. strained paraffin to ½ gal. No. 2 petrol). My first attempts to start the engine were fruitless. I injected petrol, placed hot rags round the carburettor, etc., and finally, after half an hour's pushing and running, I became overjoyed by a feeble popping which told me that the engine was actually firing at last. The acceleration, or what should have been acceleration, produced a knocking like a smithy; hills which I could before climb on top brought me down to low gear. I then got rid of this mixture and filled up with two parts petrol to one part paraffin. This mixture gave but slight advantage over the last, and it was only finally on a mixture of 4 to 1 that I could gain anything like the usual power and flexibility which I had before.

On overhauling the engine after about 500 miles running on these mixtures, I found that there was more deposit than after 2,000 miles on pure petrol, and when at last I got rid of the last of these mixtures and got back to petrol there was some pleasure in riding and in being able once again to start from cold in five yards.

F.R.G.S.

#### Suitable Mount for One-legged Rider.

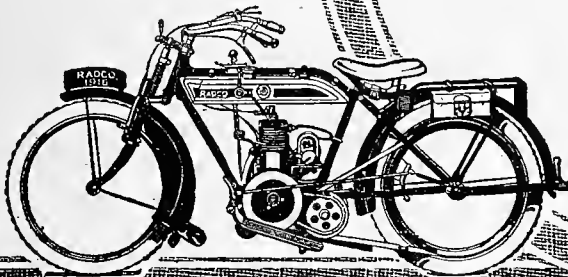
Sir,—Some correspondence has recently appeared in *The Motor Cycle* concerning suitable mounts for men who have lost the use of limbs. My left leg is practically useless. At one time I drove a small Rover car, which was easily adaptable for the right leg. Later I looked round for a motor cycle which I could manage, and at last concluded that by having the brake pedal of an "A.J.S." altered for right foot operation (a simple alteration which the makers carried out free of charge) it would be possible for me to ride it. I took delivery of this machine in July last, and can honestly say that it has given me every satisfaction. To anyone situated like myself I can confidently recommend it as a reliable and easy machine to manage. During the whole of the past cold spell I have been able to start it up without even priming the cylinders. By the way, ease of starting is facilitated if the starting pedal is covered with two layers, one over the other, of the ordinary rubber and canvas tubing used for water connection on cars. It provides a surface which can be "felt" by the foot. I found that my boot slipped from the polished pedal fitted, also that the stop at its end cut the soles of my boot.

H. TAPLEY-SOPER.

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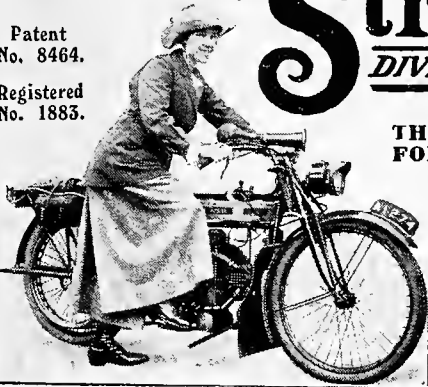
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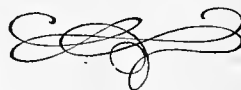
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### Diesel Engines for Motor Cycles.

Sir,—In reply to the suggestion of "Cheap Fuel," in your issue of March 9th, I think, for the following reasons, Diesel engines could not be used on motor cycles and cars.

First of all, this class of engine is seldom made under 50 h.p., and, of course, this necessitates it being started by compressed air, or an auxiliary machine. The cycle of operations of a four-stroke Diesel engine is as follows: On the downward stroke of the piston air is drawn into the cylinder and compressed on the upward stroke to a pressure of between 450 to 500 lb. per sq. in. Just before the piston reaches the top of its stroke oil fuel is injected into the combustion chamber by means of compressed air at a pressure of about 900 lb. per sq. in. Owing to this high pressure and the design of the pulveriser through which the fuel enters the cylinder, the fuel is completely atomised, and combustion takes place owing to the very high temperature of the compressed air already in the combustion chamber, this probably being 1,500° to 2,000° F. Work is then done on the piston on its downward stroke, and the final stroke expels all the exhaust gases through the exhaust valve arranged in the cylinder cover. Owing to the heaviness of the fuel the above high pressures and temperatures are essential. From the above I think it will be obvious why an engine of the Diesel type could not be used for the propulsion of a motor car or cycle.

W. E. G. MARSHALL (R.N. Artificer).

Sir,—In your issue of March 9th I notice one of your correspondents ("Cheap Fuel") raises a query as to the possibility of using a Diesel engine for a motor cycle. May I point out the impossibility of this? To begin with, the first prohibitive factor is weight per h.p. developed, the Diesel engine being heavier than a gas engine. Secondly, vibration. I do not think it would be possible to build a frame strong enough to stand this, even supposing it were possible to build a Diesel small enough for cycle or car purposes. Thirdly, we have the question of controllability, constant speed being almost necessary in order to obtain the high efficiency of this engine, and at slow speeds the power curve falls so rapidly, and as it is undesirable to govern a motor cycle engine automatically, the human element would enter into this item too much. Fourthly, we have the high temperatures reached in the Diesel cycle, and a large volume of water per h.p. developed is necessary to overcome this in comparison with the modern highly efficient petrol engine. There are many other factors which prohibit this type of engine for car or cycle purposes, but the above are sufficient.

"Cheap Fuel" mentions the fact that there would be no electrical ignition. It is this very fact which puts so high a weight factor on the Diesel engine per h.p., due, of course, to the necessary high compression ratio, and after all the present magnetos are so efficient that one is almost apt to forget their existence on the machine.

The nearest approach to the Diesel principle for car or cycle purposes is the very interesting engine invented by Dr. Low, and which I hope to hear more of in the future, but he uses petrol, I believe. I should very much like to know if Dr. Low has experimented with diluted fuels.

M. VACY-ASH, Capt., M.T., A.S.C.

Sir,—I read with interest the letters of your correspondents on the subject of Diesel engines.

The efficiency of the ordinary motor cycle or car engine is very low, as by far the greater part of the fuel is wasted in producing heat. The following engine would eliminate much of this waste. Have a cylinder without any cooling devices and lagged with asbestos. This would keep in all the heat except that lost by the exhaust. Pre-ignition would be prevented by letting in air only through the inlet valve and by injecting petrol into the combustion chamber just as the piston begins to descend. This engine would not carbonise, as any deposit would be burnt up by the pure air on the compression stroke. To prevent damage to the valves, etc., by excessive heat, water could be injected at the same time as the fuel through a separate jet. The temperature could thus be varied between, say, 200° C. and red heat. The production of steam would convert into work the heat usually lost by cooling devices, and representing about 80% of the energy of the fuel burnt. Of

course, it would be run with sparking plugs. This petrol-steam engine would be highly economical, and produce great power. The compression ratio need not be abnormal, and I should like to know why such an engine should run at constant speed. I hold that, as the air taken in and the petrol injected can be regulated, this engine should prove as flexible as any other, possibly more so, as it is partly a steam engine.

There is nothing original in the above ideas, but I should like to see them criticised by your readers.

I would be obliged if Dr. Low would divulge the nature of the "dangerous deposit" found in engines run on paraffin.

A. B. K. WATKINS.

### Carbonisation.

Sir,—I have considerable respect for your correspondent "Ixion." Week by week he is generally interesting, well-informed, and good reading. From my own experience, however, and that of various friends, I think he is quite wrong in his frequently repeated grumbles as to the necessity for decarbonising every 1,000 or 2,000 miles with a decent engine.

In your issue of the 16th inst., for instance, he says again: "Even if it were true, as some of your correspondents allege, that any sensible rider can get 4,000 or 6,000 miles out of a decent engine between decarbonisations."

From my own experience I have never found it necessary to decarbonise except at about 4,000 miles interval with any of the following engines, i.e., 3½ h.p. Ariel, 7 h.p. Indian, four-cylinder Henderson, 2½ h.p. Douglas, and the following twin J.A.P.'s, i.e., 85 × 85, 76 × 85, 70 × 64½, and 90 × 77½ (the 76 × 85 and 90 × 77½ J.A.P.'s were special high compression engines), except, perhaps, where a great deal of riding had been done over very dusty roads.

"Ixion" attributes the rapid carbonising of his engines partly to what he calls his road burning proclivities, but I daresay my average speed on a long journey would work out about the same as his.

I know that my experiences in the above matter are in no way abnormal, and all that is necessary is always to secure good carburation and use nothing but the best and most suitable oil obtainable for one's particular engine. I have used a great deal of oil costing 7s. and 7s. 6d. per gallon, but consider this an economy, in view of the better wearing of the engine in general, and more particularly the piston rings.

If "Ixion" cares to comment on the above, let him please note that I am not insensible to the bad running of an internally dirty engine, and that I take an engine down as soon as it develops the well-known symptoms (not necessarily knocking).

My late riding has chiefly been on twin engines, but when talking of decent engines twins are, of course, included, and, as a matter of fact, first-class singles are very little behind them from the carbonisation point of view.

V. OLSSON.

### MEMBERS OF THE LEGION OF FRONTIERSMEN WHO ARE NOW IN THE ARMY.

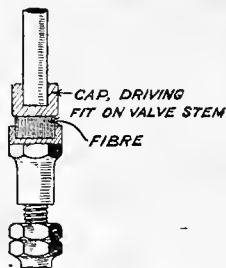
The driver and owner of the Matchless outfit is 2nd Air-mechanic G. W. Eves, R.F.C. He speaks very highly of his Matchless, on which he has covered many miles on despatch work, including a rapid run from London to Edinburgh with three up as shown.





### Valve Tappets.

Sir,—I think some improvement might be made in the silence and wearing qualities of the tappets of a motor cycle engine. With the usual broad-faced tappet bearing against the narrow end of the valve stem a hollow is gradually worn in the tappet. If the tappet is not in line with the valve stem and is free to revolve unequal wear takes place, and thus the clearance varies; there is also a tendency for the end of the valve stem to widen out. Would it not be an improvement to have a larger bearing surface on the end of the valve stem as suggested in sketch, and why not make use of fibre to gain silence, as on some car engines?



J. B. BURNETT, JUNR.

### A Two-stroke Engine after 1,000 Miles.

Sir,—I beg to put before you my own experience of a 24 h.p. lightweight two-stroke Velocette engine. My log book shows that the machine has now covered more than 1,700 miles.

Though it was high time to take the cylinder down after the first 600 miles, I was not a little surprised to find, after what I had heard about two-stroke engine carbonising, that the top of the piston and the two piston rings were absolutely free of carbon deposit, and not the slightest trace could be found on them. Since then I have had to take the engine down three times for removing carbon deposits which accumulated, and without the slightest doubt at a far quicker rate than before.

As a designer of high-powered air-cooled engines, I am very interested in the discussions regarding this subject, and though I shall refrain from sending to your valuable paper a hasty conclusion, I am convinced from my own experience that the wear of the engine has much to do with carbonisation.

The writer of your article seems to come to the same conclusion, since he says that in most instances cleaning is required every 300 or 400 miles; but he seems to have experienced no trouble practically for the first 1,000 miles, when he writes: "Do not put off the day of cleaning too long, if the rings are to be preserved!" After the first stripping of the engine, when I found there was no deposit whatever, the piston rings being free in their grooves, I refitted the cylinder as before, but when I took the engine down the second time after 1,200 miles I found the rings absolutely stuck in and resisting all endeavours to get them free. The result was that I have to break them and fit new ones, which, by the way, made no difference to the rate of carbonisation which the engine developed.

I should not like any of your readers to draw a conclusion that the Velocette shows a special tendency to carbonisation; on the contrary, it has shown marvellous qualities. I am using it every day in all sorts of weather, and for solo running and reliability this little machine has given me every satisfaction.

G. BOURCIER.

### Floatless Carburettors and Amateur Historians.

Sir,—I was amazed to read in a motor cycling journal a week or two ago a correspondence with regard to spray carburettors without float mechanism. The writers were apparently under the impression that a carburetor without a float was something of a novelty, and one writer, contradicting another as to the time when these were originated, stated that he knew of one as far back as 1909. I can perhaps throw a little light on to this subject by telling you what you doubtless already know, viz., that a number of motor cycle spray carburettors were made without float mechanism as far back as 1900, and possibly there were some even earlier.

I remember one in particular which worked remarkably well. Broadly, it consisted of a needle and diaphragm. The point of the needle entered the spraying jet, and the lift was controlled by a screw device. The air opening remained constant, and one regulated the supply of petrol by operating the screw so that the needle could rise more or less. As the petrol issued from the jet hole it struck the diaphragm

of the valve on the under side, the chamber in which the diaphragm worked being a double cone, the largest diameter being around the diaphragm. The sides of the cone were corrugated, and helped to break up the petrol which was also still further broken up by being rapidly drawn round the edges of the diaphragm. It was called a diaphragm, but it was in reality merely a brass plate formed with the valve needle. You will understand that with the alternative ebb and flow in the inlet pipe the valve was rapidly drawn upwards and returned to its seating, but it was limited in its movement by the screw stops.

The explosions produced by this type of carburetor were particularly strong, showing that the mixture must have been very nearly perfect. The only trouble with it was that the arrangement for controlling the supply of petrol, although it worked very well, was not sufficiently finely graded to enable a novice to handle it with ease. It required a certain amount of knowledge as to what to do when approaching a hill. For example, if the valve were opened too far and the mixture thereby enriched too much, the engine failed. If commonsense were used this type of carburetor was very successful.

I could send you rough sketches of several spray carburetors of the floatless type which were fitted to early motor cycles; to talk of them as being novelties in 1909 is very far from the mark. It was thought in the early days that a float feed was unsuitable for a motor cycle owing to the extra vibration of rigid fork machines causing disturbance of the float mechanism. Events, however, have proved that the supposition was incorrect. Nevertheless, I still believe that it would be quite possible to make a perfect carburetor without a float feed, as the constant level could be maintained in another way and be quite satisfactory and very much cheaper.

OLD HAND.

### Spring Frame Design.

Sir,—As we read so much of late in your columns regarding spring frames I am prompted to ask: What is a "spring frame"? The query is, I think, justified when we have on the one side springing as used by the P.V. and Indian firms, and on the other side that of the Bat and Edmund type.

Although in the first instance the rear wheels are sprung in relation to the complete frame, and in the latter only the seat pillar is sprung, the back wheel remaining as in a rigid frame, each of these firms uses the term "spring frame." It is obvious that they both cannot truthfully claim the same term, even if they are of different types, as their principles, in the main, are so different.

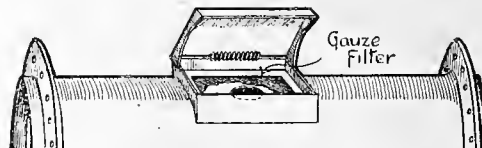
I have opinions on the matter, and think that yours and those of your readers would be very interesting on what I consider the next big step in motor cycle construction.

H. A. STEYTLER.

### Hub Lubrication.

Sir,—I enclose a sketch of an improvement I have made for hub lubrication on smaller motor cycles, which I hope may be of some use to your readers.

There is little doubt that in the ordinary method of hub lubrication much dust and dirt accumulates round the lubricator, and is carried from there into the bearings. One



way of avoiding this is to have no lubricator, and remove the whole wheel to replenish with grease; but removing a back wheel is often a very tiresome business.

I have made an attempt to design a hub lubricator with a removable gauze filter attached, so that no dust or dirt can be carried into the bearings, and yet it can be replenished with oil on the spot. The lubricator is larger than usual, shaped like those on Bosch magnetos with the detachable gauze filter inside. Thus when dirt accumulates on the gauze it may be taken out and cleaned.

C. L. WHEATLEY.

We wish to call the attention of all users of E.I.C. Magneto  
(whether they be on Government Service or not) to the Guarantee  
as printed below.

E.I.C. MAGNETO GUARANTEE

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MANUFACTURERS OF  
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**This is to Certify** that we undertake to replace any part free of charge which (during a period of 12 months from the date on which the machine leaves our Works) breaks down or unduly wears due to faulty workmanship or material. Providing that the magneto is returned to us complete, carriage paid and make of machine from which it has been removed stated. It is to be understood also that our guarantee does not hold good if the magneto has been disassembled, i.e. end-plates or magnet removed.

In the event of any failure to give satisfaction occurring which cannot be righted by simple adjustments as set out in our instruction leaflet, the magneto should be returned to us intact, together with full name and address of sender, which should be attached to magneto, also a letter stating all required particulars regarding same sent per post.

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Signed for and  
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of the Company \_\_\_\_\_  
Directors

This Guarantee was not issued till late in 1915, therefore there may be some users of E.I.C. Magneto who have not received same. The Guarantee is now enclosed in Instruction Booklet, both of which we wish every user to have in his possession.

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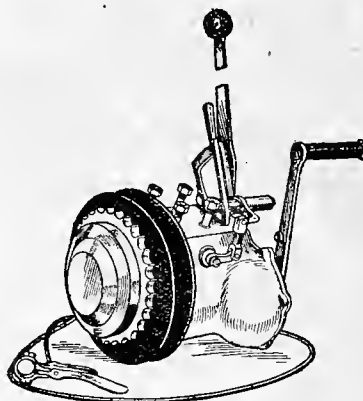
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no other.



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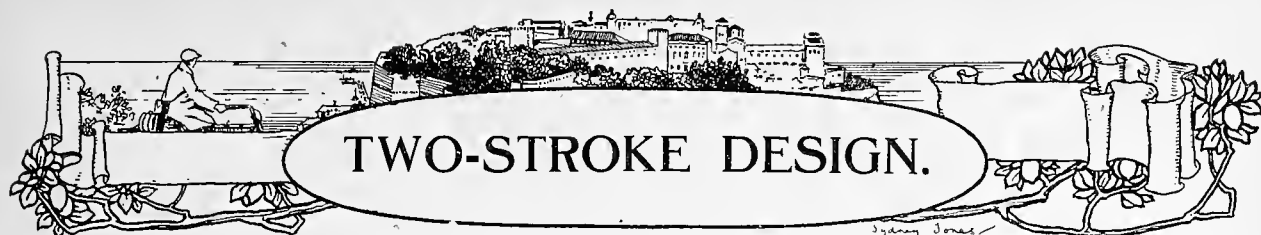
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## TWO-STROKE DESIGN.

**A**LTHOUGH this branch of internal combustion engineering is nearly as old as its four-stroke rival, it is not by any means in such an advanced stage. Comparatively little written matter on this subject exists at all, and that which does exist differs widely in opinion. Taking a certain piston displacement as a basis to work upon, it is evident that it is possible (theoretically) to convert twice as much fuel into energy with a two-stroke as with a four-stroke. At low speeds this may be very approximately the case, but as the speed increases the value of  $\eta p$  falls considerably in types which have piston-operated ports, and which rely on crank case compression for recharging the cylinder. With four-stroke engines the value of  $\eta p$  at high speeds is almost entirely dependent upon the efficiency of the valve mechanism, and as the charging periods are roughly  $200^\circ$  in the four-stroke to  $90^\circ$  in the two-stroke, it will be seen that volumetric efficiency, important as it is in the former, is doubly so in the case of the latter. There seems to be great diversity of opinion as to what is the ideal pressure at which the charge should be admitted into the cylinder.

It is possible, by means of disc cranks and the use of a differential or stepped piston, with a closed end to obtain crank case compression ratios of 3 to 1 and over. This, coupled with a large port opening, undoubtedly makes for a good volumetric efficiency, even at moderately high speeds.

The much-talked-about stratification of gases, by which it is claimed that the induced gas keeps to one side of the cylinder, forcing the exhaust gas in front of it, is very often a myth.

If stratification is obtained at high speeds it is absolutely lost at low. This is easily proved by the amount of unburnt gas which passes into the silencer with the exhaust, and which greatly accounts for the excessive consumption of some of these small engines.

The exhaust port, being of necessity uncovered first, is left open after the transfer port has closed and further helps this waste.

Again, the intake port to the crank case is open for a very short period only, and operates on the carburettor in a series of violent staccato sucks. Owing to the great difference in inertia between the petrol and air column it will be seen that at low speeds a large amount of fuel will be lost due to the continued spraying of the jet after the port has closed. The mixture will want careful variation to suit different speeds, which is amply substantiated by the fact that it is quite an art in lever manipulation to make some engines two-stroke at low speeds.

Again, condensation of petrol vapour occurs in the crank case, and having a great affinity for oil it soon helps to diminish the latter's lubricating qualities.

Of course, the great advantage of this type of engine is due to its simplicity, a highly desirable feature in all engineering products, but it seems to the author that in the pursuit of this ideal not enough attention has been paid to the essential.

### Points to be Considered.

As regards future developments. If the two-stroke is to be developed for car requirements, and also for high-powered motor cycle construction, as it undoubtedly will be, some methods will have to be devised which—

- (1.) Keep a good value of  $\eta p$  at high speeds.
- (2.) Economise fuel.
- (3.) Admit of automatic carburation even at greatly varying speeds.

The possibilities of the differential or stepped piston for pre-compression of the working charge have by no means been given a fair trial. The engine would, of course, have an even number of cylinders, and the pre-compression space of one cylinder would be coupled up to its neighbour, cranks being at  $180^\circ$ .

By using aluminium alloy the extra dimensions of the piston do not give any weight troubles, especially as the shaft speed of a two-stroke need not be as high as that of a four. The gudgeon pin can be placed low down and the end closed, as the larger portion gives good wearing surface for any side pressure due to angularity of the connecting rod.

Scavenging may be by pure air, and the fuel admitted in a liquid state under pressure as in a Diesel, the chief trouble here being to arrange a pump which will deal with small enough quantities, about .05 c.c. per stroke at full load on a 85 mm. x 88 mm. engine.

### Concerning Cooling.

If the design of the engine gives a value of  $\eta p$  similar to that of a four-stroke at a corresponding speed, say 70 lb. at 2,500 r.p.m., water-cooling will become a necessity—the lower value of  $\eta p$ , and therefore the smaller amount of heat generated, being the only reason why it has not become universally employed at present.

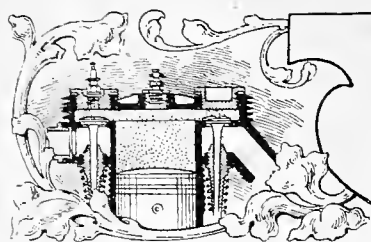
As regards balance, the four-stroke has an unbalanced primary force, while the two-stroke has an unbalanced couple. To keep this as low as possible the cranks should be kept close together and fitted with balance weights.

In conclusion, it may be said that in the author's opinion the head of the cylinder is the best place for admitting the fresh charge, by means of some suitable valve, and through a belt of ports situated all round the cylinder, thus avoiding as much as possible a streaky mixture. The piston could thus be dome-topped and the exhaust released through a similar belt uncovered at the bottom of the stroke.

A. C. WICKMAN.

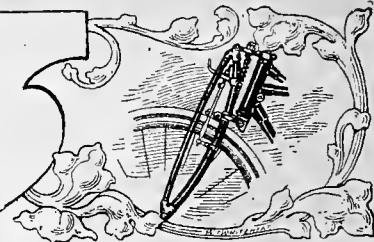
\* An engineering term—mean effective pressure x mechanical efficiency.





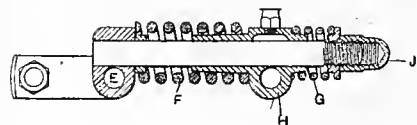
# PATENTS.

Abridged by ERIC W. WALFORD.



## The Latest Brampton Fork.

As was the case in the original construction, the fork girder A is connected to the lower part of the steering column by a pair of links B, and the same springs C are employed to take the vertical load. In the present construction, however, the single upper resilient connection is replaced by duplicated link members D, which afford greater lateral stability. One link D is shown in detail in the small view. It is provided with an eye E at one end for attachment to the steering column, and at the other end it is screwed. Upon the link are springs F and G, between which is a slide H attached to the upper end of the fork girder. The springs and slide are retained in place by a helmet nut J screwing upon the threaded end of the

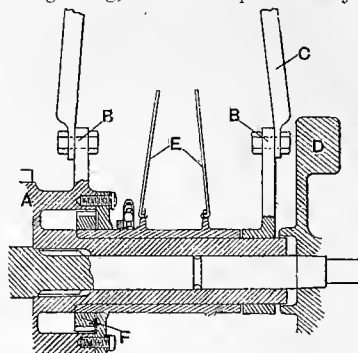


link. The operation is the same as in the original well-known pattern, an up-and-down motion being afforded by the links B, whilst the slide H permits a certain amount of to-and-fro motion under restraint of the springs F and G. —H. S. Yoxall and J. J. Richardson, No. 17,583, 1914.

## An Auxiliary Driving Wheel.

One of the earlier forms of application of a motor to a cycle was the Singer motor wheel, in which the engine, tank, etc., were arranged within the circumference of a wheel, which could either be used at the front or the rear. The construction here illustrated comprises a complete wheel and power unit, but in this case the engine and gear are arranged outside the wheel and on either side of the frame. The crank case A is provided with limbs B whereby it is attached to the stays C after the ordinary rear wheel has been removed,

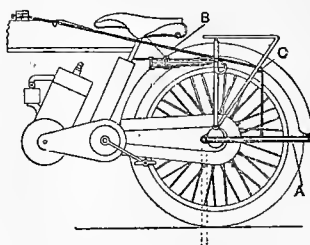
The crankshaft is extended to carry the flywheel D on the opposite side of the wheel to the engine, and the hub of the wheel E is driven through change-speed gearing, the final pinion only of



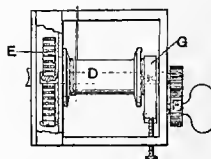
which is illustrated at F. The disposition of the main parts is clearly shown in the side view. —Auto-Wheels, Ltd., and A. M. Pooley, No. 22,165, 1914.

## Rear Stand Improvement.

The stand A itself is of the ordinary kind, and is pivoted to the chain stays as usual. The invention lies in the operating mechanism, for which purpose there is employed a cable B passing over a pulley C, and attached at one end to the stand A and at the



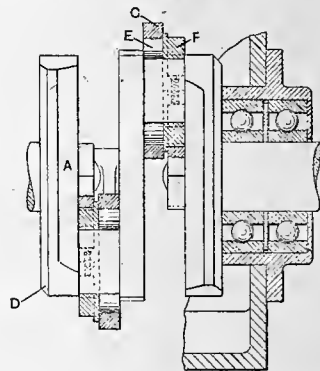
other to the operating mechanism shown in the smaller drawing. This mechanism is located on the top tube, and comprises a spool D, on which is wound the cable C. At one end the spool is connected to a spiral spring E, whilst at the other is a winding device F and a locking band G. The construction is such that in operation, assuming the stand to be in the raised position, the spring E may be wound up and locked. When it is desired to drop the stand, the band G is freed, allowing the spool to rotate, paying off the cable B, and permitting the stand to fall. To raise the stand, the spring E (which, as



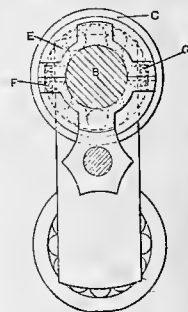
stated, has been previously wound) is caused to rotate the spool in the requisite direction for winding up the cable B, whereby the stand is raised. No actual manual operation is therefore required by the stand itself. —J. M. Herrington, No. 8,027, 1915.

## Roller Big-end Bearings.

Where a two-throw crankshaft is employed, and it is desired to use roller bearings for the big ends of the connecting rods, it is usually necessary for the crankshaft to be of the built-up



type. The construction illustrated, however, enables a single piece shaft to be employed. The shaft A is case-hardened, and the crank pins B themselves form the inner races for the rollers. The outer races C are constituted by the enlarged ends of the connecting rods, and the crank webs are bevelled as shown at D to enable the big ends to pass over them into position around the crank pins. The big ends are narrower than their pins, in order to afford sufficient space for the rollers E to be passed into position. The clearance is then taken up by the insertion of split filling pieces F, which are assembled on the crank pin and locked by grub screws G. —G. E. Bradshaw, No. 24,190, 1914.

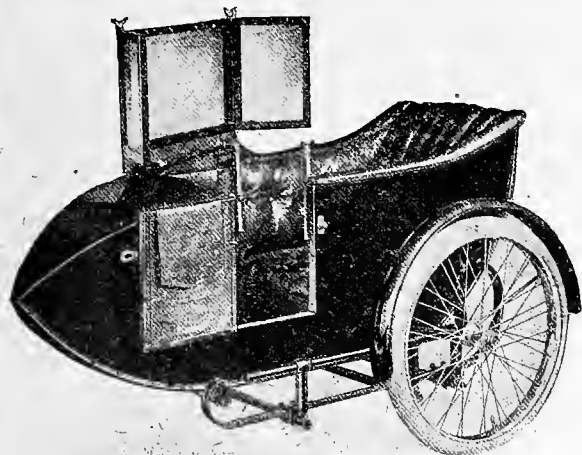


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**A**N ideal windscreen—keeps the passenger always snug and cosy in the coldest weather and free from draughts.

The side wings are detachable, and the screen can be tilted to any angle. It will fit any make of car.

A twist of a wing nut is sufficient to release the catch and let the screen swing across and allow the passenger to alight.

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YOU CUT YOUR FUEL BILL IN TWO**

if you adopt my system and use my fuel. You can, of course, use petrol or benzol without alteration.

Price of  
Carburetter  
complete—

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plus 10% extra  
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FIT ANY  
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Small extra Tank  
to clip on Frame,  
Pipe & 3-way Tap  
to enable you to  
get an easy start  
when stone cold.

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plus 10%  
war advance.



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### MY 3-PHASE JET DAMPING CARBURETTERS

have such perfect vapourising properties that they enable you to use fuel at 1/- per gallon in 42-gallon casks, which you are allowed to keep on your premises. Your engine will tick over dead slow, and pull dead slow in traffic, yet give the full power. It is almost impossible to tell you are not running on petrol at 2/6 a gallon. It cannot damage your engine or soot it up, and makes Motor Cycling possible in these times.

I give you my personal assurance of the truth of what is stated above. Please send at once for full particulars of the carburetter, and also for my Treatise on Carburation, and terms of One Month's Approval Trial.

**C. BINKS, Ltd., Eccles.**

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Postal Orders sent in payment for advertisements should be made payable to **LILFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

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For the convenience of advertisers letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money is deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding 10 in value, a deposit fee of 2s. 6d. is charged, when under 10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Lilffe & Sons Limited.

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Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

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**ADVANCE** 7-h.p. Twin Combination, 2-speed counter-shaft, Bosch, B. and B.; £20, or offer.—87, New Park Rd., Brixton. [2731]

### A.J.S.

**A.J.S.**, 1916.—All models in stock, or for early delivery.—Moss, Wem. [X5435]

**A.J.S.**, 1916, 6-h.p., actually in stock.—Crow Bros., 190, High St., Guildford. [2514]

**1914 A.J.S.**, 2½-h.p.; £40.—Linington, 54, Commercial Rd., Portsmouth. [2657]

**A.J.S.** 3-h.p. Twin, 1911 model, good condition, £16.—Stiles, St. Andrew's, Norwich. [2776]

**JULIANS**, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all A.J.S. models. [X2833]

**A.J.S.**, 6-h.p. Combination in stock.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X5428]

**SHREWSBURY** Agent for A.J.S.: 2½-h.p., 4-h.p., and 6-h.p. models in stock.—J. C. Pickering. [X3443]

**A.J.S.**, 1913, 6-h.p., 3-speed, C.B. sidcar, lamps, speedometer, etc.—Hudfield, Chemist, Matlock. [X5125]

**A.J.S.**, 1913, 2½-h.p., 2-speed, clutch, just completely overhauled by makers, all accessories; any trial, bargain, £28, or exchange higher power.—Box L1,028, c/o The Motor Cycle. [2872]

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10291.	3½	NORTON, variable gear	£37 10
10292.	4½	1914 3-sp. E.S.A. and Sidcar	£50 0
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10301.	8	1913 BAYARD Light Car	£125 0
10302.	10	1915 RITZ Light Car	£110 0
10303.	6	1912 2-sp. MATCHLESS & Sc.	£40 0
10304.	2½	1913 2-sp. DOUGLAS	£30 0
10305.	6	1914 3-sp. BAT and Sidcar	£55 0
10306.	3½	1912 3-sp. PREMIER & Sc.	£30 0
10307.	3½	1910 Single-speed TRIUMPH	£22 10
10310.	4½	1915 3-sp. QUADRANT & Sc.	£62 10
10254.	2½	1910 2-sp. ALLON	£35 0
10257.	6	1914 3-sp. BAT	£37 10
10260.	3	1914 2-sp. ENFIELD	£32 10
10262.	2½	1915 Model U DOUGLAS	£48 0
10267.	2½	1915 2-sp. NEW HUDSON	£30 0
10268.	10	1913 2-sp. HENDERSON & Sc.	£55 0
10271.	2½	1915 2-sp. LEVIS	£37 10
10272.	8	1916 ENFIELD Com. dynamo	£95 0
10274.	2½	1915 2-str. ROYAL ENFIELD	£32 10
10287.	8	1914 Grand Prix MORGAN	£100 0
10289.	3½	1913 3-sp. TRIUMPH	£37 10
10290.	4	1911 3-sp. TRIUMPH	£42 10
10238.	8	1913 ZENITH and Sidcar	£8 10
10233.	1½	AUTO-WHEEL	£20 3
10232.	2	1915 2-stroke WOLF	£20 3
10231.	4	1914 2-sp. T.T. SINGER	£40 0
10226.	8	1914 C/shaft ZENITH and Sc.	£60 0
10225.	2½	1915 2-sp. CALTHORPE-J.A.P.	£27 10
10223.	2½	1911 2-stroke CLYNO	£27 10
10221.	1½	1911 2-sp. J.E.S.	£20 0
10205.	3½	2-sp. M.S.U.	£20 0
10200.	15	1915 TRUMBULL Light Car	£100 0
10172.	10	1914 2-sp. HENDERSON & Sc.	£55 0
10144.	2½	1915 2-sp. DOUGLAS, W.O.	£50 0

10142.	3½	1913 3-sp. SINGER	£32 10
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10113.	10	1913 4-cyl. FORD	£67 10
10109.	3½	1909 F.E. TRIUMPH	£25 0
10093.	3½	1913 3-sp. ROVER Combination	£40 0
10091.	2	1912 CENTAUR	£15 0
10087.	6	1914 4-cyl. Baby PEUGEOT Light Car	£97 10
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10070.	6	1914 2-sp. ENFIELD Combin	£65 0
10068.	3½	1912 QUADRANT, variable gear	£20 0
10042.	3½	1913 3-sp. DOUGLAS, Model U	£48 0
10021.	3½	1912 SWIFT	£20 0
10009.	4½	1915 3-sp. JAMES	£52 10
9953.	2½	1915 2-sp. 2-stroke TYLER	£27 10
9946.	2½	1914 3-sp. T.T. FORWARD	£29 0
9931.	6	1914 3-sp. A.J.S. and Sidcar	£73 10
9896.	3	1913 2-sp. twin ENFIELD	£35 0
9867.	4½	1911 2-sp. ENFIELD	£22 10
9847.	4½	1915 3-sp. QUADRANT	£42 10
9839.	3½	1907 TRIUMPH and Sidcar	£22 10
9772.	3½	1914 w-cooled 3-sp. HUMBER	£35 0
9746.	6	1914 3-sp. NEW HUDSON and Sidcar	£60 0

9633.	2½	1912 PREMIER, variable gear	£18 10
9542.	2½	1915 2-sp. SUN-VITESSE	£32 10

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## MOTOR CYCLES FOR SALE.

### A.J.S.

**A.J.S.** 6-h.p. Combination, 1916; £102/18; exchanges considered.—Campion Garage, London Rd., Derby. [2621]

**A.J.S.** 5-h.p. Twin, coachbuilt sidcar, perfect condition; £35.—Ireland, Sankey, Warrington. [2659]

**1912 A.J.S.**, 2½-h.p., 2-speed, clutch, good condition; bargain, £17/10.—Box L1,020, c/o The Motor Cycle. [2882]

**A.J.S.** 4-h.p. Combination, absolutely new, unsold; note price, £87.—Haworth, 42, Burlington St., Blackburn. [2580]

**A.J.S.**, 2½-h.p., 1915, expensive speedometer, lamp, etc., only ridden 300 miles; £47.—Campion Garage, London Rd., Derby. [2622]

**A.J.S.**, 1914, 2½-h.p., 2-speed, clutch, kick starter, complete, accessories; £38.—Pocock, 46, Lewin Rd., Stoke Newington. [2679]

**A.J.S.** 4-h.p., and sidcar, 1916 model, just delivered, £93/17; also 1916 2½-h.p. model, £98.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

**1914 A.J.S.** Combination, not used since September, 3 Lucas lamps, dissolved acetylene outfit, 2 extra Lucas generators, excellent condition; £65 nett.—Haworth, 42, Burlington St., Blackburn. [2578]

### Alldays.

**SHREWSBURY** Agent for Allons; all models in stock.—J. C. Pickering. [X3444]

**ALLON**, 1915, 2-speed, clutch, all in very good condition; £35.—Redfern, Honiton, Devon. [X5389]

**1914 Alldays** Matchless, 2½-h.p., 2-stroke, 2 lamps, accessories; £17.—111, Grove Lane, Camberwell. [2646]

**ALLON**, 1916, 2½-h.p., 2-speed, not run 30 miles; a snap; £36.—Ideal Cycle Co., Thundersley, Essex. [2755]

**3½-h.p. Alldays** Roc 2-speed gear, complete, tools, and 2 accessories, just overhauled; £20.—Elley, Motors, Ladbury. [X4652]

**ALLDAYS** Allon, all models: immediate delivery; easy terms 2½ extra.—Referee Cycle Co., 332, High Holborn. [0763]

**1915 Allon**, 2½-h.p., 2-stroke, countershaft drive, all accessories; £25.—Wilkins, Boot Stores, High St., Edgware. [X5209]

**ALLDAYS** Allon, 2-stroke, 1915, as new, with accessories; £27, or near offer.—99, Nightingale Lane, Balham, S.W. [2672]

**ALLON**, 1915, 2-speed, 2-stroke, tyres and condition absolutely perfect.—Dove, Pleasureton, Northumberland Av., Gosforth, Newcastle. [X5432]

**ALLDAYS**, 3½-h.p., 3-speed, chain drive, coachbuilt sidcar, built Sept., 1914, with all accessories, in splendid condition; price £40.—Telephone: Barnet 5471. [2577]

**ALLDAYS** Allon, 1916 model, 2½-h.p., 2-stroke engine, countershaft 2-speed, luxuriously fitted with black finished lamp, horn, and speedometer, ridden 20 miles; cost £48; private owner, will accept £35.—Ideal Cycle Co., Thundersley, Essex. [2676]

**ALLDAYS** Allons, all models from stock; we give special attention to the requirements of novices; deferred payments by mutual arrangement; also 1915 Allon single-speed £27, and 1916 2-speed clutch model £75.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2765]

## MOTOR CYCLES FOR SALE.

## Alldays.

1915 Allon 2-stroke, and Watsonian coachbuilt featherweight sidecar, lamps, horn, etc., only ridden 800 miles, excellent condition: £35.—3, West St., Ditchling, Hove, Sussex. [2575]

3 1/2 h.p. Alldays and Sidecar, with 2-speed, free engine, 2 new tyres, and belt, Bosch mag., B. and B. carburettor, adjustable pulley; must be sold; nearest £30.—Estate Office, Bonaces Rd., Edmonton, London, N. [X3997]

ALON. 2-stroke, 2-speed, clutch model, supplied new in December, 1915, very little used; 34 gns., very great bargain.—Julians, Broad St., Reading. Biggest motor cycle and light car dealers in the South. 45 years' reputation. 'Phone: 1024. [X4813]

## Antoine.

ANTOINE, 1912, 3 1/2 h.p., good condition: £12.—G. W. Lavington, Leighfield, Pollards Hill East, Norbury [2559]

## Ariel.

1915 3-speed Ariel, kick starter, accessories: £48.—Whiting, Castlethorpe, Bucks [2681]

ARIEL. 5-6 h.p., 1914 1/2, coachbuilt sidecar, kick starter, in perfect condition, new tyres; accept £60.—Williams, 65, Wydelhurst Rd., Addiscombe, Croydon. [2590]

## Arno.

3 1/2 h.p. Arco Combination, 1913, good order, new tyres and belt;—bargaie, 20 gns.—18, South Bruton Mews, Bond St., W. [2784]

## Auto-Wheels.

UTO-WHEEL De Luxe; £15/15, 25/3 monthly.—See at 248, Bishopsgate, London. [2827]

UTO-WHEEL, perfect running order, £27/10.—F. Deeming, 53, Loog St., Atherton. [X5505]

UTO-WHEEL; bargain to immediate purchaser, £4/10, first cheque.—Poole, Tullamore. [X5454]

1915 Auto-Wheel De Luxe, £15/15, very little used; £9/10.—Compton, Elmswell, Bury St. Rd. [X5525]

UTO-WHEEL, 1915, late model, unscratched, can be seen running, guaranteed, £8/8.—Geo. Smith, 268, Laveador Hill, Clapham Junction. 'Phone: Battersea, 1271. [2901]

UTO-WHEEL, with Humber bicycle, complete; a bargain at £12; in perfect order, shock absorber fitted; on view in Crordou; owner going abroad.—Shirehampton, Ninehams Gables, Caterham. [X4708]

## Basil.

BASIL-J.A.P., 1913, 4 h.p., 3-speed, clutch, beautiful machine; £25.—Speechley, 45, Church Rd., Acton. [X5420]

## Bat.

BAT, 1914, 8 h.p., T.T., 3 speeds, countershaft, speedometer, in real good order; £36.—Percy and Co., 337, Euston Rd., London. [2732]

1914 Bat-Jap, 5-6 h.p., Millford sidecar, wind screen, hood, 3-speed, kick starter, 3 lamps; £55; excellent condition.—Haworth, 42, Burlington St., Blackburn. [2582]

BAT-J.A.P., 8 h.p., 1915 B. and B. carburettor, Sturmeys 3-speed, coach sidecar, excellent condition; £45.—Rushdon, 1a, Harberson Mews, Harberson Rd., Balham. [2853]

1914 Bat-Jap, 8 h.p., Montgomery coach sidecar, little used, 3 speeds, French grey, will ride within 20 miles Walwyn; £45 cash; must sell.—Martin, Whitwell, Welwyn, Herts. [2617]

BAT, 5-6 h.p., late 1915 model, countershaft 3-speed gear box, spring frame, J.A.P. engine, lamp, horn, spares; cost £30; all as new, only done 250 miles; accept £65.—Buxter, Waratah, Lower Walton, Warrington. [X5211]

BAT-J.A.P., 1914, 6 h.p., special 85-64 1/2 overhead valve engine, 3-speed gear, kick-starter, T.T. model, Kempshalls, little used, in quite new condition, and very fast; £45.—Wallis, 49, High St., Saffron Walden, Essex. [X5492]

1914 5 h.p. Bat, coach sidecar, Armstrong 3-speed, clutch, Bosch, Amac, with Pilot jet, spring seat, luggage carrier, 2 front lamps, electric rear lamp, many spares, bought Jan., 1915, perfect condition; £50; exchange Harley-Davidson, Matchless combination.—28, Mitcham Rd., Tooting. [2616]

## Blackburne.

BLACKBURNE, late 1914, T.T., 3 1/2 h.p., 3 speeds, hand clutch, special blue finish, as new, and Mills-Fulford sidecar; £44.—H.S., 7, Coolhurst Av., Crouch End, N. [2551]

## Bradbury.

BRADBURY, 4 h.p., 2-speed combination, grand order; £25, offer.—Avis, 68, Weltje Rd., Hammersmith, W. [2563]

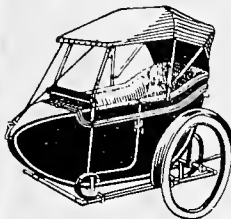
BRADBURY, 1913, 4 h.p., 2-speed, free engine, new coachbuilt sidecar; £29.—29, St. Leonard's St., Bow, E. [2822]

BRADBURY, 1913, 4 h.p., N.S.U. gear, recently overhauled, good tyres; £26.—Stafford, 14, Harper St., Liverpool. [X5347]

BRADBURY, 1912, 4 h.p., S.A. 3-speed gear, speedometer, and sidecar; price £27.—J. Keenan, 31, Chester Rd., Traunmere, Birkenhead. [X5448]

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3 1/2 h.p. LINCOLN-ELK, 1912 model ..... £15 15  
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3 1/2 h.p. SINGER, 1912, 3-speed model, with cane Sidecar ..... £25 0  
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3 h.p. HUMBER Tricar ..... £5 5  
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## Bradbury.

FOR Sale, 1914 Bradbury motor cycle, 4 h.p., 2-speed gear, free engine, in both clutch and pulley, and sidecar, coachbuilt, good condition; £40.—Nelson, Stainwells, Scawley, Brigg. [1945]

BRADBURY, 4 h.p., free engine, kick starter, 2-speed countershaft, very powerful, tyres new, in grand condition, hardly been used; great bargain, £35.—McVoy, 65, Burton Rd., Brixton, London. [2841]

1914 6 h.p. Coachbuilt Combination, countershaft 3-speed, enclosed chain drive, new 26 x 3 heavy Pedley hack tyre, F.R.S. lamps, mechanical horn; £50.—The Premier Motor Co., Aston Rd., Birmingham. [2694]

## Brown.

3 1/2 h.p. Brown, T.T., inst. running order; £8; exchange for lightweight; any trial.—Andrews, Chestnuts, New Romney [2651]

## B.S.A.

SHREWSBURY Agent for B.S.A.; delivery from stock.—J. C. Pickering. [X3445]

B.S.A., 1914, chain drive, with sidecar; 50 gns.—33, Coten End, Warwick. [X5408]

1916 B.S.A., countershaft 3-speed models in stock.—Lambert's, Thetford [2610]

B.S.A., 1916.—Both models in stock, or for immediate delivery.—Moss, Wem. [X5436]

1916 4 1/2 h.p. 3-speed Countershaft B.S.A.; £62.—Parker and Son, St. Ives, Hunts. [2863]

B.S.A. 1912 Clutch Model, nearly new belt and tyres; 20 gns.—Stiles, St. Andrew's, Norwich. [2778]

JULIANS, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all B.S.A. models. [X2834]

B.S.A., 1916 model K's, actually in stock; £62.—Freeman, 50, Brighton Rd., Redhill, Surrey. [2281]

B.S.A., 1916, 3-speed, model K, just received from works; £62.—5, Elm's Buildings, Seaside Rd., Eastbourne. [2809]

B.S.A., late 1913, clutch model, in new condition, perfect; £36; exchange.—Ideal Cycle Co., Thundersley, Essex. [2754]

B.S.A., 1916 models, in stock, model H £64; B.S.A. No. 2 sidecar, £18/18.—Hucklebridge, 133, Sloane St. London, S.W. [X4779]

B.S.A., 1915, model H, with coachbuilt sidecar, screen, hood, lamps, etc.; 70 gns.—Baker, 102, Temple St., Bristol. [X5452]

B.S.A., 1915, chain drive, Montgomery sidecar, speedometer, lamps, spare tyre and tube; £56.—Giles, 112b, Balmoral Rd., New Brompton. [X5504]

B.S.A. 1915, 4 1/2 h.p., 3-speed, clutch, kick starter, and coachbuilt sidecar, excellent condition; £60.—J. Godden, 17, London Rd., Reading [X5440]

B.S.A., 1915 1/2, K model, 4 1/2 h.p., new tyre, and belt, all accessories, Rudae coachbuilt sidecar, good as new; £65.—Dodd, Caister-on-Sea, Norfolk. [X4699]

B.S.A., 1915, 4 1/2 h.p., chain-cum-belt, 3-speed, complete; worth £50 easily, accept £45, bargain, cash only.—Layton's Garage, Bicester, Oxon. [X5395]

B.S.A., 1916, 4 1/2 h.p., model K, chain-cum-belt, 3 speeds, kick-starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton, London. [X5380]

B.S.A., 1914 1/2, 4 1/2 h.p., countershaft, 3 speeds, kick-starter, coachbuilt sidecar, in real good order; 45 gns.—Percy and Co., 337, Euston Rd., London. [2733]

B.S.A., 1916, 4 1/2 h.p., countershaft, chain-cum-belt models; we can deliver from stock at £62 cash, or deferred payments.—Layton's Garage, Bicester, Oxon. [X5401]

B.S.A. 1916, 4 1/2 h.p., countershaft, chain-cum-belt, used twice, guaranteed unsold and perfect; cost £62 Feb. 4th, accept £53/10.—Tollady, Hemmingford, Bicester. [X5404]

1914 3 1/2 h.p. B.S.A., chain-cum-belt, 3 speeds, little used, perfect condition, speedometer, lamp, etc., accessories; seen by appointment; £42/10.—Box 221, c/o The Motor Cycle. [X5210]

B.S.A., 1916, 4 1/2 h.p., chain-cum-belt combination, only done few miles, F.R.S. and Lucas lamps, speedometer, horn, hood, screen; what offers?—Brown, 36, James St., Perth. [X5359]

B.S.A., 1916, model K, £62, or with Canoelet model 1 1/2 sidecar; £75/15; good make 1914 machine, in first-class condition, taken in part exchange.—J. J. Shepherd and Co., Enfield Highway. [2601]

A. L. PITTS, B.S.A. representative in the town they are made, can give deliveries of all models, carriage paid; tuition free; spare parts per return.—50-54, Evesham St., Redditch. Tel.: 91. [X5531]

B.S.A., 4 1/2 h.p., 1915 1/2, 3-speed, chain drive, aluminium sidecar, sporting model, disc wheel, large number accessories, not run 600, guaranteed perfect; cost 90 gns., accept 70 gns.—Brown, Glover's Court, Preston. [X5449]

B.S.A., models H and K, from stock. To tradesmen who are short staffed, let us quote and demonstrate one of our commercial combinations; deferred payments by mutual arrangement. Also 2 second-hand models 1912 clutch £29, and 1913 2-speed £40.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [2764]



## MOTOR CYCLES FOR SALE.

## B.S.A.

B.S.A., 1914 $\frac{1}{2}$ , T.T., Lucas L.W. horn, Millers Magnification lens head light, rear light, tools, pump, new condition throughout, guaranteed perfect, mileage under 1,000; £42.—Trowsdale, 45, Tossion Terrace, Newcastle-on-Tyne. [X5411]

B.S.A., 1914, 4 $\frac{1}{2}$  h.p., chain, 3-speed, 1915 Bramble 1516 sidecar, speedometer, mirror, 2 lamps, 2 horns, new spares, re-tread, 2 chains, 2 sprockets, etc.—A.C.U. insurance, £45, excellent condition; £57.—West 204, Maldon Rd., Colchester. [2751]

B.S.A., 1914, 4 $\frac{1}{2}$  h.p., countershaft all-chain model, complete with B.S.A. sidecar, excellent outfit. Equipment includes sidecar wind screen, 2 lamp sets, Junior Long horn, etc.; accept £46, no offers, cash only.—Layton's Garage, Bicester, Oxon. [X5396]

B.S.A.—New 1916 models from stock; inspection card dially invited. All-chain drive £64, chain-cum-belt transmission £62, fitted with B.S.A. countershaft gear, free engine, and kick start; B.S.A. sidecars to fit, £16; gradual payments entertained; second-hand machines taken in exchange; generous allowance; tuition and free delivery. Buy from B.S.A. appointed agents. Phone: Holborn 5777. When dealing with Wauchope's, purchasers can deal with confidence.—Wauchope's, 9, Shoe Lane, Fleet St., London (just off Ludgate Circus). [X5481]

## Calthorpe.

1914 Calthorpe Junior, 2 h.p., 2 speeds, good condition; £15.—4, Talbot St., Burnley. [X5360]

SHREWSBURY Agent for Calthorpes; all models in stock, or for early delivery.—J. C. Pickering. [X3446]

CALTHORPE, new, splendid lightweight, with latest mag., 2 $\frac{1}{2}$  h.p., 2-stroke; £28/16.—Seen at 243, Bishopsgate, London. [2828]

CALTHORPE, latest 2-speed lightweight models in stock; cash or exchange; no waiting.—Eagles and Co., High St., Acton, London. [X5381]

CALTHORPE-J.A.P., 1915 $\frac{1}{2}$ , 2 $\frac{1}{2}$  h.p., Enfield 2-speed, lamps, 45 m.p.h. guaranteed, almost new; 27 gns.—32, Comeragh Rd., West Kensington. [2774]

CALTHORPE Lightweight, 2 $\frac{1}{2}$  h.p. Precision engine, and 2-speed gear, in new condition; £22.—Hedley, 610 and 612, High Rd., Chiswick, W. Phone: 1581 Chiswick. [X5415]

CALTHORPE Motor Cycles, 1916 Models.—Just arrived: 2-stroke 2-speed 31 gns., J.A.P. 2 $\frac{1}{2}$  h.p. 2-speed 36 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [0777]

CALTHORPE, 2 $\frac{1}{2}$  h.p., 2-stroke, single-speed, electric head light and flash battery, horn, mirror, spare belt and tube, all late 1915, everything guaranteed perfect; £22, or offers.—Box L1,027, c/o The Motor Cycle. [2875]

CALTHORPE-J.A.P., 1916, latest 2 $\frac{1}{2}$  h.p. 2-speed models in stock, 36 gns.; lady's 2-stroke 2-speed, 34 gns.; extended terms quoted.—Elce and Co., 15-16, Bishopsgate Ave., Cannon St., E.C. City Agents. Phone: Avenue 5548. [0481]

CALTHORPE—1916 new lightweights from stock, improved design, fitted with J.A.P. engine and Enfield 2-speed gear, £37/16; identically the same machine without 2-speed gear, £32; 2 $\frac{1}{2}$  h.p. 2-stroke 2-speed model, £32/11; extended payments arranged.—Wauchope's, 9, Shoe Lane, Fleet St., London. [X5482]

## Chater-Jap.

1913 4 h.p. T.T. J.A.P., Chater-Lea frame, Dunlop tyres, in excellent condition; £25.—Bond, Park Sq., Luton, Beds. [2607]

3 $\frac{1}{2}$  h.p. 1912 J.A.P., Chater frame, T.T. bars, long 32 exhaust, Bosch, B.S.A. variable jet carburettor, Brooks, spares, tools, perfect condition; £14/10.—Dixon, 9, The Crescent, Surbiton. [2584]

CHATER-J.A.P., 3 $\frac{1}{2}$  h.p., 1913, combination, new front tyre, lighting set, Bosch, thorough running order, spares, accessories; £28/10, no offers; bargain.—A. W. Harrison, Hagbury St., Droitwich. [X5223]

## Chater-Lea.

3 $\frac{1}{2}$  h.p. Chater-Lea, Binks, chain drive, good order; £21.—Nuncollas, Ventonleague, Hayle, Cornwall. [X4992]

CHATER-LEA, 3 $\frac{1}{2}$  h.p. J.A.P., with Armstrong gear, and coachbuilt sidecar, in good running order.—Seen at 243, Bishopsgate, London. [2829]

CHATER-LEA, 8 h.p., 2-speed, 1 $\frac{1}{2}$  White belt, speedometer, lamps, 2-seater cane spring wheel sidecar, screen; £42.—74, Shrewsbury Rd., Forest Gate. [2674]

CHATER-LEA 1911 6 h.p. Twin Combination, 2-speed P. and M. gear, large 2-seater coachbuilt sidecar; £27.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [2669]

## Chater-Sarolea.

CHATER-SAROLEA, 5 h.p. twin, F.E., Bosch, fine condition; £15/10.—12, Shalstone Rd., Mortlake. [X5466]

## Clyno.

LATE 1912 Clyno Combination, good order; £35; or exchange Morgan A.C. or late combination, cash adjustments.—Spearmans, Rothwell, Leeds. [X5372]

1913 Clyno 6 h.p. 3-speed Coachbuilt Combination, complete, perfect order; any trial; £50, or near offer.—Elm Cottage, Cati-field, Fareham, Hants. [2789]

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## Clyno.

CLYNO 6 h.p. Twin, with cane sidecar, 2-speed gear, with lamps and horn complete; £40.—Hedley, 610 and 612, High Rd., Chiswick, W. Tel.: 1581 Chiswick. [X5413]

CLYNO 1914 C.B. Combination, spare wheel, hood, wind screen, all new condition; £62, or exchange lower power.—Spurling, The Cottage, 2, Brondesbury Park, N.W. [2647]

CLYNO Combination, Lucas head lamps, rear lamp, horn, and mirror, 5 gns. speedometer, steel studded cover on rear, all tyres, including spare, perfect, lot of tools and accessories; £45.—8, Lowlands Rd., Harrow-on-the-Hill, Harrow 425. [X5352]

CLYNO, 1912 $\frac{1}{2}$ , 5-6 h.p., countershaft 2-speed, Bosch waterproof mag., wicker side entrance sidecar, Eoots automatic drip feed, head lamp, rear lamp, Lucas 24/- horn, 2 spare valves, etc., in excellent condition; £35.—Hill, 2, Pretoria St., Castleford. [2605]

## Connaught.

SHREWSBURY Agent for Connaughts; early delivery.—J. C. Pickering. [X3447]

CONNAUGHT, 2 $\frac{1}{2}$  h.p., standard model, lamps, horn, cyclometer; £23.—207, Westwood Rd., Goodmayes, Essex. [X5313]

CONNAUGHTS in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £28/7.—P. J. Evans, John Bright St., Birmingham. [2813]

## Dot.

DOT-J.A.P., free engine, 8 h.p., wicker Millford sidecar, all good as new; £50.—Taylor, 64, Princespade, Southport. [X5320]

## Douglas.

DOUGLAS, 2 $\frac{1}{2}$  h.p., V, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2 $\frac{1}{2}$  h.p., U, 2 or 3-speed, in stock; from £50/8.

DOUGLAS, 2 $\frac{1}{2}$  h.p., W, 3-speed, clutch, in stock; £56/14.

DOUGLAS, 2 $\frac{1}{2}$  h.p., X, ladies', kick start, in stock; £56/14.

DOUGLAS, 2 $\frac{1}{2}$  h.p., War Office model, in stock; £52/12.

DOUGLAS Agents and Specialists.—We refrain from mentioning 1916 models as at present there is no likelihood of obtaining deliveries. We can immediately supply and deliver the above latest models, brandy new, at rock bottom prices.—T.A. Bicycles, Tel.: 388.—Robinson's Garage, Green St., Cambridge. [6864]

1915 4 h.p. Douglas, 3-speed, in sound order.—Lambert's, Thetford. [2613]

1911 2 $\frac{1}{2}$  h.p. Douglas, newly overhauled; £17/10.—4, Talbot St., Burnley. [X5361]

1912 2 $\frac{1}{2}$  h.p. Countershaft Douglas, sound condition; 19 gns.—1, Temple St., Halifax. [X5473]

1911 Douglas, 2-speed, clutch, good order; £20.—Write, C. 32, Dordrecht Rd., Acton, W. [2586]

DOUGLAS 2-speed, clutch, lamps, speedometer; £35.—Rowlands, opposite Chalk Farm Tube Station. [2568]

DOUGLAS, 2 $\frac{1}{2}$  h.p., 1914 (Sept.), T.T., very fast, perfect condition; £38.—28, William St., Rochdale. [X5432]

DOUGLAS, 2 $\frac{1}{2}$  h.p. twin, good condition, perfect running order; £20/10.—King, 206, Fulham Rd., S.W. [2845]

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4 h.p. 1915 Douglas and sidecar, 3-speed, Lucas lamps, all spares; £57.—Tolchard, Butcher, Leytonstone. [2747]

DOUGLAS, 1915, 4 h.p., 3-speed, and clutch, Douglas sidecar, good condition; £60.—Moffat, Yeovil. [X5339]

3 $\frac{1}{2}$  h.p. Douglas, 2-speed, and kick-start model, 1914; £35; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X5480]

DOUGLAS, 1914, clutch, 2 $\frac{1}{2}$  h.p., with cigar cane sidecar; £36; appointment.—61, Walsingham Rd., Hove, Sussex. [X5348]

DOUGLAS, 1914, 2-speed, clutch, speedometer, lamp, etc., run 400 miles; £35.—11, Luna Rd., Thornton Heath, S.E. [2724]

DOUGLAS, 1913, special T.T., overhauled, lamps, generator, horn, new tyre, accessories.—Burton, Kinnerton St., W. [X5314]

1915 Douglas, 2 $\frac{1}{2}$  h.p., 2-speed, perfect condition, all accessories; price £42.—H. Bird, 69, High St., St. John's Wood. [2655]

LATE 1913 Douglas, 2-speed, electric light, horn, fast, perfect; bargain, £30.—203a, Lower Addiscombe Rd., Croydon. [2745]

DOUGLAS, 1914, 2 $\frac{1}{2}$  h.p., 2-speed, clutch, little used; offers, exchange.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X5427]

DOUGLAS, 1914, 2 $\frac{1}{2}$  h.p., T.T. model, fast, complete, and in excellent order; £36.—Layton's Garage, Bicester, Oxon. [X5397]

DOUGLAS, 1914, 2 $\frac{1}{2}$  h.p., 2-speed, lamps, etc.; £35, or exchange, A.J.S. preferred.—Chemist, 23, Skinner St., Clerkenwell. [2792]

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SUNBEAM, 3½ h.p., 3-speed .....	£73 10
SUNBEAM, 8 h.p., 3-speed .....	£94 10
EXCELSIOR (American), 7 h.p., 3 speeds ..	£75 0
CALTHORPE Minor, 10 h.p., 2-seater ..	£185 gns.
NEW IMPERIAL, 2½ h.p., variable magneto	£38 0
OVERLAND, new, 12 h.p. model, 2-seater ..	£220 0
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DOUGLAS MODELS. ....	Orders booked now.

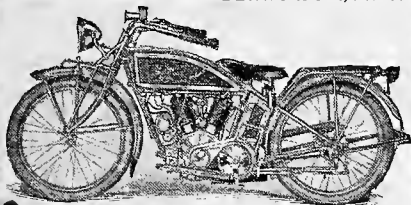
## (U.S.A.) EXCELSIOR.

1916, 7 h.p., twin, 84 × 89, mechanical and hand lubrication, kick starter, high-tension magneto, spring forks, 2-gallon petrol capacity, 3-speed countershaft gear, multiple disc clutch with hand and foot control, handle-bar control, spring seat-pillar, 3in. non-skid tyre, finish Excelsior grey; latest 1916 model, £75.

Exchanges quoted. Easy payments arranged.

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*WOLF-J.A.P., 2½ h.p., 2-speed .....	£37 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke ..	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed .....	£39 10
*ROYAL RUBY, 6 h.p., 3-speed .....	£87 0
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DOUGLAS, 1913, T.T., 2-speed, engine just overhauled by makers, guaranteed perfect; any trial; £27.—Pollard, Cedar Av., Chelmsford. [X5405]

DOUGLAS, 1913, 2-speed, free engine, clutch, kick start, little used; £38; practically indistinguishable from new.—Ashworth, Cloud, Congleton. [X5426]

DOUGLAS, 1915, Colonial model, 2-speed, clutch, kick start, good condition; bargain, £45; exchanges.—Ideal Cycle Co., Thundersley, Essex. [2755]

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DOUGLAS, 1914, W, clutch, kick-start, footboards, upturned handle-bars, tyres excellent, engine perfect; £37/10.—Robinson's Garage, Green St., Cambridge. [6866]

DOUGLAS, 1912-13, free engine, clutch, 2 speeds, new tyres, lamps, horn, spares, perfect condition; any trial; enlisting; £32.—Alter 7, 43, Harborton Rd., Highgate. [2794]

1915 3-speed Douglas, 2½ h.p., purchased December, full accessories, used occasionally, almost new; Triumph Baby, similar, part payment.—L1,003, c/o The Motor Cycle. [2570]

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DOUGLAS, late 1913 model, 2-speed gear, clutch, kick-start, and footboards, excellent order, just overhauled, new pistons and clutch, etc., fitted; £35.—Moss, Wem. [X5438]

DOUGLAS, 2½ h.p., T.T., 2-speed, absolutely like new, expensive accessories, little used, perfect; any examination; £39; trial; bargain.—Remex, Dawson Rd., Kingston, S.W. [2686]

DOUGLAS, 1912, 2-speed, tyres unpunctured, Watford speedometer, accessories, and spares; may be seen at Harrods Motor Depot; £24.—Day, 67, Sunderland Rd., Forest Hill. [2857]

DOUGLAS 4 h.p. Combination, 2-speed gear, F.R.S. lamps, Cowey speedometer, Lucas horn, and rear lamp; £50.—Medley, 610 and 612, High Rd., Chiswick, W. Tel.: 1581 Chiswick. [X5414]

DOUGLAS, 1912-13, 2½ h.p., T.T. model, new Kemp-shalls, chain and belt, Lucas lamps, horn, speedometer, like new throughout; £22/10.—3, Victoria Mans., Victoria Rd., Clapham, S.W. [2564]

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DOUGLAS, 1915, T.T., brand new, £54; a 1914 T.T. in nice condition, £34; a 1915 4 h.p. combination, smartest in London, disc wheels, enamelled violet, £55.—Percy and Co., 337, Euston Rd., London. [2734]

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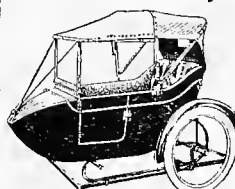
1916 A.J.S. Com., 6 h.p., detachable wheels	98 gns.
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1915 WOLF, lightweight, 3-speed .....	£25 0
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8-10 h.p. Precision Engine, quite new. What offers?	£6 0
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Set of Miller's Cycle Car Lamps and Gen- erator (new) .....	£3 0
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**DOUGLAS**, 1914, 2½ h.p., kick-start, 2-speed, clutch, head and tail lamp, all accessories; owner enlisted; no reasonable offer refused; guaranteed perfect; any trial, see any time.—Heath, 420, Richmond Rd., E. Twickenham. [2788]

**1915 Douglas**, 2½ h.p., 3-speed gear, Spartan horn, absolutely perfect condition; to be cleared at 42 gns.; exchanges easy terms.—Julians, Broad St., Reading. Biggest motor cycle and light car dealers in the South; 45 years' reputation. Phone: 1024. [X4812]

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**1916 Coventry Eagle**; £28, with accessories.—Troward, Heathurst, Vale of Health, Hampstead. [2884]

## Elswick.

**1915 Elswick-Precision**, 2-stroke, Druids, etc., as new; £18/10.—Write, 28, Wintith Rd., Earlsfield, S.W. [2677]

**1914 Elswick**, in good running condition; £20.—Uxbridge Motor Co., Ltd., 101, High St., Uxbridge, Middlesex. [2635]

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**ELSWICK-PRECISION** Combination, 1913, 4½ h.p., 3 speeds and clutch, Canoelet sidecar, accessories, spares, and tools, first-class running order; £38.—96, Waddington Rd., Bolton. [X5463]

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**NEW Royal Enfields** for immediate delivery.—Ireland, Sankey, Warrington. [2663]

**1913 Royal Enfield**, 2½ h.p. twin; £26.—Garaged at 239, Liverpool Rd., Islington. [2675]

**ROYAL Enfield**, 3 h.p., 2-speed, splendid order; £25.—T. Morrison, Agent, Langholm, N.B. [2576]

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**2½ h.p.** 1912 Royal Enfield, 2-speed, and free, kick start, overhauled; £24/10.—Tomlinson, Grove, Ilkley. [2585]

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**ENFIELD**, 2-stroke, 2-speed, latest pattern, new, unsoiled; £40 nett.—Haworth, 42, Burlington St., Blackburn. [2581]

**TWO 6 h.p.** Royal Enfield Combinations, perfect, 1912 and 1913; £40 and £48.—Ireland, Sankey, Warrington. [2658]

**ENFIELD** Combination, 1916, as new, done 150 miles; owner called up; £80.—Write, Pearson, 11, Paternoster Row, London. [2628]

**ENFIELD**, 1915, 6 h.p. combination, Lucas dynamo set just overhauled by makers; £82/10.—66, High St., Stoke Newington, N. [X5377]

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**ENFIELD**, 6 h.p., 2-speed, cane combination, recently enamelled, overhauled, re-bushed at cost £10; cash £42/10.—84, Spring Bank, Hill. [2749]

**1912-13 Royal Enfield 6 h.p.** Combination, complete; real bargain, 39 gns.—Newnham, 223, Hammersmith Rd., W. Phone: Hammersmith 80. [2795]

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**ENFIELDS** actually in stock for immediate delivery: 6 h.p. combinations, 3 h.p. and 2½ h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [2812]

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**ROYAL Enfield (1914)**, 6 h.p., with sidecar, and all accessories, perfect condition, and can be seen by appointment.—London.—Write, Box 309, Smith's Agency, Ltd., 100, Fleet St., E.C. [2630]



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<b>HUMBER</b> lightweight, 1912-13, 2 h.p., magneto, etc. Handy machine	£12 0
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<b>GONNAUGHT</b> , 1914, 2½ h.p., 2-stroke, 2-speed, with kump, horn, etc.	£26 0
<b>SUN-VILLIERS</b> , 2-str., with accessories	£20 0
<b>ZENITH</b> , 6 h.p. J.A.P. engine, Gradua gear, speedometer, lamp, and horn	£30 0
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<b>ALLON</b> , 1915, 2½ h.p., 2-speed	£30 0
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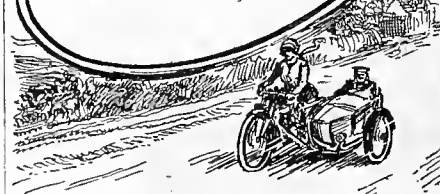
20 h.p. <b>ENFIELD</b> , 1915, special finish, dynamo lighting, many extras	£185
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**ROYAL Enfield New Combination**, 6 h.p. and 8 h.p., 6 chain driven machines, fitted with handsome coachbuilt sidecar, countershaft gear and free engine, up-to-date turnout, complete with storm apron; 85 gns.; tuition free, and free delivery to any address within 50 miles of London; best terms for cash, exchange, or extended payments.—Wanchope's, 9, Shoe Lane, London. [X5483]

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**3 h.p.** Fafair-Chater, Senspar, Palmers, Whittle belt; bargain, £5.—7, Arundel Rd., Dorking. [2855]

## F.N.

**F.N.**, 2 h.p., good condition, mag.; £9.—Rowlands, opposite Chalk Farm Tube Station. [2569]

**F.N.**, 5-6 h.p., 2 speeds, clutch, good condition throughout; £15/10.—Stiles, St. Andrew's, Norwich. [2775]

**F.N.**, 2½ h.p., countershaft 2-speed, clutch, splendid order throughout; £14/10.—Speechey, 45, Church Rd., Acton. [X5419]

**1914 F.N.**, 4-cyl., 2-speed, kick starter, coachbuilt sidecar; bargain, £45.—The South Essex Motor Co., High Rd., Ilford. [X5274]

## Grandex.

**GRANDEX-PRECISION**, 1916, 2-stroke, 2½ h.p., quite new; listed £34, for £31; fine model.—Grandex, 86, Gray's Inn Rd., W.C. [1705]

## Harley-Davidson.

FOR Harley-Davidsons, see below.

**HARLEY-DAVIDSON**, model F; £68/5.—The Premier Motor Co., Birmingham.

**MODEL J**, with dynamo lighting outfit; £76/13.—The Premier Motor Co., Birmingham.

**YOU** Save over £12 by purchasing direct from The Premier Motor Co., Aston Rd., Birmingham.

**SIDECARS** for Harley-Davidsons. We save you money. Immediate delivery.—The Premier Motor Co., Aston Rd., Birmingham. [2550]

**1916 Harley-Davidsons**, all models in stock.—Parker and Soo, St. Ives, Hunts. [2858]

**SHROPSHIRE** Agent for Harley-Davidsons; 1916 models, delivery from stock.—J. C. Pickering. [X5448]

**HARLEY-DAVIDSON** Models in stock, complete with Gloria sidecar.—Turpin, 22 and 29, Preston Rd., Brighton. [0713]

**HARLEY-DAVIDSON**, Model 11C, with coachbuilt sidecar, late 1915, quite new; £58.—Salter, 55, Old Kent Rd., S.E. [2566]

**HARLEY-DAVIDSON**, model 11F, 1916, 3 speeds, sidecar, Stewart, horn, lamps, new August; £70.—Bond, 245-247, Euston Rd., N.W. [2653]

**HARLEY-DAVIDSON**, 1915, 7-9 h.p., 2 cyles, 3-speed, electric lamps and horn, splendid condition; best offer above £60.—7, Stanhope Rd., Sidcup, Kent. [2667]

**HARLEY-DAVIDSON** model 11J, only slightly soiled, complete with new 20 gn. Gloria coachbuilt sidecar; £80.—The Premier Motor Co., Aston Rd., Birmingham. [2896]

**HARLEY-DAVIDSON**, 7-9 h.p., with best Gloria sidecar, purchased Aug. 1915, only run 500 miles, quite equal to new; £75; owner called to colours.—Macintosh, 14, Victoria St., Wolverhampton. [X5345]

FOR Best Terms and earliest delivery, place your order with the firm who introduced the *Silent Grey* in the Midlands. We offer the model P 7-9 h.p. Harley Davidson 3-speed at £68/5, or the model J with dynamo electric lighting equipment £76/13; delivery same day that order is received. Carriage paid to any address. Tuition free if required. Get in touch with us now and save money.—The Premier Motor Co., Aston Rd., Birmingham. [2071]

## Henderson.

**IMMEDIATE** Delivery from stock of the new 8-10 h.p. 4-cyl. Henderson, the all-weather motor cycle, 82 gns.; exchanges arranged; trial run and tuition free.—The Premier Motor Co., Aston Rd., Birmingham. [2531]

**1915 Henderson**, 10-12 h.p., 2 speeds, handle-bar clutch, Stewart speedometer, 5 h.p. lamp, 5-late exhaust whistle, horn, and rear light, run 600 miles, tyres, unworn, perfect; 59 gns.—Troward, Heathurst, Vale of Health, Hampstead. [2883]

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

**Advertising and Publishing Offices:**  
20, Tudor Street, London, E.C.

Telegrams: "Cyclist, Fleet, London."  
Telephone: 2848 City (five lines).

**Editorial Offices:**  
Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
Telephone: 10 Coventry (five lines).

**Northern Offices:**  
199, Deansgate, Manchester.

Telegrams: "Hiffie, Manchester."  
Telephone: 620 City.

## The Prohibition of Imports.

**W**E announced last week the Board of Trade's decision to prohibit the importation of motor cars and motor cycles for private uses. This new Order follows quickly upon the imposition of the 33⅓ per cent. import tariff levied upon foreign-made machines last October. The total prohibition, severe as it is from the agents' point of view, is not nearly so drastic a measure as it would have proved a year ago, when considerable quantities of motor vehicles were being imported (the 1915 motor cycle imports were £263,323). Of late the value of imported motor cycles has been affected by the usual winter slackening period, but the advent of spring has provided some amount of stimulus. The chief demand for machines comes nowadays from business men over, and young men under, military age. But quite apart from civilian buyers of motor cycles, there is an increasing demand from the thousands in khaki, particularly officers, who find that a motor cycle is almost indispensable when they wish to reach home or the nearest town from the camp at which they may be situated. Agents are the chief sufferers by this new edict. They will be robbed entirely of American machines as soon as the stocks in this country are absorbed, and dealers are already suffering from the greatly reduced supply of British machines. The decision, however, must have been foreseen in many quarters. We can express sorrow that this Order (unless it is merely a temporary measure) will rob all and sundry of the opportunity of seeing in being the latest productions of the States. It will be agreed that, much as we have taught the American manufacturer in the design of motor cycles—particularly in the early days—we have, on the other hand, to admit that in many points the Americans have shown us the lead.

But to turn to another important aspect of the question, we may enquire if the Board of Trade, in introducing so drastic a measure, has considered its likely effects upon British trade? It is clear that the go-ahead American will find a market for his wares, and, de-

prived of British patronage, the first move we predict will be to neutral countries in which British machines have hitherto been predominant, and, indeed, every country throughout the world where motor cycling is popular. So that, unless the Board of Trade is alive to the position and releases the fettered hands of our British manufacturers, America will be able to poach upon our preserves, so to speak, and the British manufacturer will be an irritated but helpless spectator. It will be conceded that home manufacturers do not wish for markets to themselves: fair competition is encouraged rather than otherwise, but, unless the Board of Trade rises to the occasion, it cannot be agreed that British manufacturers will be privileged to enjoy fair competition. Thus the Board of Trade slogan, "Capture enemy trade," becomes an empty phrase—mockingly empty, indeed, as it is within the bounds of possibility that we may not be able to retain our own trade connections.

We sincerely hope that men with business acumen who control the destinies of our trade will study this aspect of the question, and assist our manufacturers not only in exporting machines to maintain our rate of exchange, but to help to preserve those channels of trade which become more valuable as the weeks of war go by. The official Proclamation prohibits as from March 27th the importation of the following articles into the United Kingdom:

"Motor cars, chassis, motor cycles, and parts and accessories of motor cars and motor cycles (other than tyres), with the exception of the motor cars, chassis, accessories, and parts, which are at present exempted from import duty under Section 13 (4) of the Finance (No. 2) Act, 1915."

Business vehicles are thus free to enter the country upon a Board of Trade licence being obtained, for the point was made the subject of a particular application by *The Motor Cycle* to the Board of Trade in October last, when the 33⅓ per cent. duty was introduced. Large numbers are now employed by tradesmen and others who have given up their horses for Army purposes, and it is likely that the uses of the motor cycle sidecarrier will be considerably extended.



## A MOTOR RAFT.

Novel Use of a Motor Cycle Engine and Some Petrol Tins.

THE sporting and novel craft illustrated is the work of a former English motor cyclist who saw service in the German (now British) South-west African campaign, and who is now with the Union Forces in the East African fighting. His name is J. Dutton, and before the war he was for some time with the Austin Motor Company at Northfield, Birmingham.

Dutton built his boat during a spell of civilian work in the Transvaal, in the interval between the two African campaigns. A number of petrol tins and a single-cylinder Griffon motor cycle engine form the essential parts. The former were soldered together, and a bow and stern fitted. The engine is started by a cord round the belt pulley. Unfortunately, Dutton has not sent further constructional details, but we presume, from mention of a universal joint, that the engine drives a propeller direct *via* a car-type cardan-shaft. However, we are told that the outfit has proved a great success, and the builder has explored many miles of the Vaal River, besides spending a three weeks' holiday on it. The latter was particularly pleasurable. Light luggage, guns, and fishing tackle were stowed on board, and a most enjoyable time spent. One great advantage of this raft is its lightness—it can be lifted easily by two people.

This is yet another instance of the adaptability of the ordinary motor cycle engine. The war has shown this point up very strongly, but, in addition to military uses, motor cycle engines are employed for driving grindstones, bob sleighs, and now a home-



Mr. J. Dutton's motor raft, constructed with petrol tins and a single-cylinder Griffon motor cycle engine.

made raft. And there are other uses as well, the instances given being set down off-hand.

Motor cycle bob sleighs are very popular in the United States, and we have already illustrated many types, but climatic conditions prevent (to any extent) the same sport in England. However, this does not stand in the way of "motor rafting," and anybody wanting a change of recreation this summer can be recommended to follow Mr. Dutton's example.

Dutton, by the way, once had a very exciting, not to say unpleasant, ride from Johannesburg to Bloemhof. His mount was a single-gear B.S.A., and he nearly died on the veldt from thirst. His machine got badly sand-bogged, with no signs of habitation or any living thing in sight, and Dutton considers that he was saved by the water in the acetylene generator.

We wish to thank Capt. H. L. Smith, A.S.C., M.T., for forwarding us the photographs and particulars relating to the raft. Dutton served with Capt. Smith in the German South-West African campaign.

### DUBLIN TRIAL RESULTS.

THE awards and marking in the St. Patrick's Day trial of the Dublin and District Motor Cycle Club to Glendalough and back, reported in our last issue, are as under:

#### SILVER MEDALS.

	Marks.
R. Armstrong (8 h.p. Enfield sc.)	100
G. McKenzie (5 h.p. Indian sc.)	100
S. Morrogh (2½ h.p. Douglas)	100
S. Allen (3½ h.p. James)	100
D. Allen (2¼ h.p. Sun)	100
P. H. Hurse (4¼ h.p. B.S.A.)	100

#### BRONZE MEDALS.

M. Fennell (4 h.p. Norton sc.)	98
L. Carter (7-9 h.p. Excelsior sc.)	97
M. Keegan (3½ h.p. Triumph)	94
S. Redmond (3½ h.p. Indian)	94
C. S. Kettle (4¼ h.p. B.S.A. sc.)	93



The motor raft "all out" on the River Vaal, Transvaal.

# Occasional Comments by "Ixion"



## Horizontal Twins in Winter.

One of the intrinsic peculiarities of the horizontal twin is that it must necessarily have a long induction pipe. If the air supply is not heated in any way, irregularities must occur in the mixture during winter until the metal gets warmed up by conduction from the cylinders, as the petrol condenses whilst passing along these cold pipes. If freezing troubles are experienced in cold weather, it pays to lag the induction piping in felt; or if a hot air supply can be arranged, the jet size can usually be reduced, and some economy of petrol effected.

## Against Top Feed Carburetters.

Judging from my correspondence, there is a very considerable prejudice amongst riders against the new design of carburetter, though the trade remains obstinately silent. The following objections are reiterated *ad nauseam* by my correspondents:

1. Inaccessibility.
2. Constant choking of filter gauzes.
3. Frequent absence of any provision for lowering petrol level (often wrongly set); several riders have put washers under the jet.
4. Liability of float chamber lid to turn when spanner is applied to petrol union.

## Some Air-cooling Experiments.

When the Rudge and other firms began to place the inlet valve overhead of the exhaust valve, I suggested that the reverse placing might be superior, on the dual ground that the hot exhaust valve would be further away from the cylinder, and so reduce lop-sided heat distortions, and that the exhaust valve gave more trouble than the inlet, and therefore shrieked for the more accessible position, when one valve had to be rendered comparatively inaccessible. Mr. Bradshaw, writing in *The Autocar* on March 18th, ascribes the success of the latest A.B.C. engine in no small measure to the fact that the exhaust valve is overhead; it thus gets the maximum cooling, and that without feeding back its surplus heat into one side of the cylinder, and so tending to warp the cylinder. Incidentally, the exhaust valve has a detachable seating, so that valve and seat can swiftly be spun true in the lathe. I do not think I have enjoyed this particular convenience since I drove an Ariette. I wonder how many readers remember the Ariette—a revived and improved Leon Bollée—which blossomed for a few interesting months at the height of the original tricar boom about 1906.

## Mr. Bradshaw on Piston Design.

Mr. Bradshaw is also very interesting on piston design. Like all high-speed riders, he knows that when you have succeeded in getting a cylinder that does not distort under heat, the next job is to keep your piston round when its top is nearly red-hot. He knows two methods of doing so. The first is to over-oil, which he rightly pronounces extravagant, adding

that it accumulates lumps of burnt oil inside the piston and spoils the balance, whilst further tending to overheating; the second is to conduct the heat away to the cylinder walls, which method he adopts. I timidly inform him of a third, which I personally have employed for years; perhaps he will mock at it. I distort my new pistons when I take over a new machine by driving the engine rather blue; and at frequent intervals I take out the piston and find it is no longer round, some of the distortion remaining after cooling. I true the piston back into rotundity with a great file, distort it again, and so on until the piston seems incapable of further distortion.

## Where the Two-stroke Scores.

In contrasting the future possibilities of the various types of lightweight, it must not be forgotten that the two-stroke gives more power than a four-stroke of the same c.c. for the simple reason that it has a firing stroke for every revolution, as against the one firing stroke per two revolutions of the four-stroke. On the other hand, it does not give double the horse-power developed by a four-stroke of the same c.c. because it cannot inhale so large a charge, seeing that its suction period is shorter, and efforts to supply it with forced induction have so far introduced compensating disadvantages. Broadly speaking, if a 300 c.c. four-stroke gives 3 h.p. at maximum efficiency, a 200 c.c. two-stroke will give 4 h.p. at the same rate of revolution. As some reserve of power is especially valuable with tiny engines, this point gives the baby two-stroke a real scoop in the forthcoming battle.

## Petrol Lubrication and Carburation.

I question whether recent correspondents lay sufficient stress on the interference of oil in the carburation of two-strokes, more particularly when they are lubricated by the "petrol" system, and especially so when the inlet port is adjacent to the carburetter. Whatever method of oiling such engines is employed, the piston can be relied upon to keep both the ports by which mixture reaches the cylinder (*i.e.*, the mouths of the transfer pipe and of the inlet pipe proper) dripping with oil; and certain dispositions of these ports enhance the trouble considerably. Indeed, one eminent firm of carburetter designers actually avoids supplying carburetters to certain types of engine as far as possible, seeing that the design effectually prevents the best carburetter from securing two-stroking at low speeds.

While I am on the subject, here is a very simple puzzle for novices to diagnose. The other day some idiot flooded the crank case of my "baby" with oil. When the machine was wanted, I started the engine up and let it run free to clear out the oil as a quicker method than taking out the drain tap. Almost instantly a tall geyser of mingled oil and petrol spirted a yard high from the vent hole in the petrol tank stopper. Why?

## THE HUBS OF MOTOR CYCLES.

HOW THEY HAVE BEEN IMPROVED AND MADE MORE WEATHERPROOF TO MEET MILITARY AND OVERSEAS REQUIREMENTS.

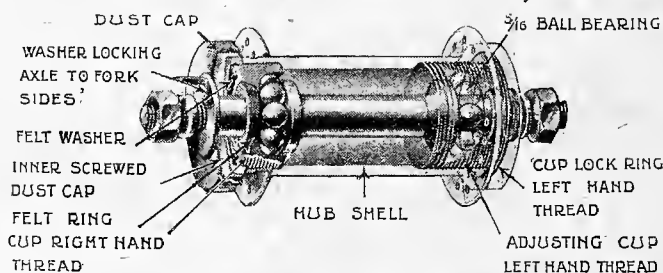
**"N**OTHING is stronger than its weakest part," and the many letters, which we have received from the various war zones and elsewhere prove very conclusively that the hubs of many motor cycles are not what they should be either in the matter of wear or of weatherproofness. The former is, of course, largely influenced by the latter, as grit and water are certain to cause unsatisfactory service, but it is also to some extent due to the materials or their treatment falling short of what is required to make a really satisfactory hub. The balls themselves, if of sufficient size, generally perform their duty well, for they are made by experienced men with the greatest care and exactness. This is fortunate, for a broken ball when it does occur—and such a mishap is by no means unheard of when the balls are on the small side—plays havoc with the whole bearing. Sometimes the case-hardening of the cone does not extend deeply enough into the metal, with the result that as soon as the hard skin is worn through the surface becomes pitted, as it were, and uneven, after which satisfactory running is at an end, and it becomes impossible to adjust the hub correctly.

### Riders' Neglect.

In many cases the trouble is the fault of the riders themselves, for they do not take the trouble to adjust their bearings correctly, and rapid wear results owing to the hammering of the parts. A badly adjusted wheel also more readily admits of the ingress of dirt and water. This stricture applies more to men at the Front, despatch riders and others, who do not own the machines they ride and can usually obtain small renewals, which are fitted by the artificers for the asking. It must be urged in their excuse that their time is often very fully occupied in the service of their country, and that, when they return tired out from their arduous tasks, they can hardly be expected to spend their leisure on overhauling and adjusting their machines. Still if the hubs were perfect no adjustment would be necessary for several thousand miles; in fact, one well-known firm fits non-adjustable Skefko bearings to the detachable rear wheel, which shows that they have good reason to believe their hub to be capable of running a long distance without adjustment.

Front hubs are certainly more vulnerable than rear hubs, largely because of the smaller clearance. Mud and water run down the forks and quickly work their way into the bearings unless some sort of protection is provided; also, when the machine is at rest a certain amount of dirt may run down the spokes, with the same result. If the front mudguards were wider a large quantity of mud which now falls on to the forks and hub ends would fall clear of the wheel. We have often been amazed to find that so much dirt could be deposited all over front wheel bearings without finding its way inside. Some methods of excluding it are certainly very efficient, but still on many machines there is much room for improvement.

Part of the trouble is possibly due to the fact that hubs are in many cases not made or designed by the manufacturers of the machine to which they are fitted, but by the hub-making specialists, who sometimes find that cheapness is more profitable than high quality.



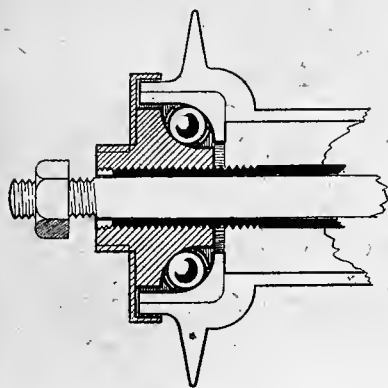
The Douglas hub which has disc adjustment.

### Hub Lubrication.

It has been generally found more satisfactory to lubricate hubs with some kind of grease or hub lubricant, as this in itself tends to exclude grit and water without the help of any special design, but it is not a very easy matter to get this grease into the hub through the small lubricator provided. Some arrangement to which a grease gun could be screwed seems to be desirable. Why not a hollow spindle with a suitable thread at the orifice which, when in use, would be completely covered by the domed nut already standard on several makes? This would be far less trouble than taking down the hub and repacking it with grease at the end of every 1,000 miles or so—a job which many riders are apt to postpone unduly, or even *sine die*.

### Some Good Examples.

Referring now to our illustrations of representative hubs: **The Douglas** is a disc adjusting hub, a little puzzling, perhaps, to a novice, but very efficient in use. It is very well protected by dust caps, and two felt washers are utilised on each side. This is the 1916 pattern, and we are not surprised to hear that it has been most successful in use and is giving good service at the Front.



Norton.

The Norton hub is built with a view to quick detachability; the axle upon which the cones are carried is hollow, and a solid spindle passes through it; when this is removed, which necessitates the undoing of only one nut, the wheel drops out. The weather-

proofing is

achieved, as in the Enfield, by a dust cap covering the end of the hub, a running clearance only being provided.

The Enfield is a well-tried pattern which has been in satisfactory use for some time. There is no felt washer, and it depends for its weatherproof effect upon a dust cap which covers the end of the hub. The balls are carried in cages and are of large size.

The Lea-Francis hub has many points of excellence. There is, first of all, a greater clearance between the hub and the forks than is found on most machines; that, as we have already explained, is a desirable feature, and would have a considerable effect in keeping the bearings clean, even if no other means were provided. Further, a felt washer is held in a gland nut which is screwed into the hub to meet the cone, and the hub is so constructed that very little grit should get even as far as the felt, and certainly none should pass it; this felt washer will also assist in retaining the oil. The gland nut also forms a groove on the outside of the hub, which should carry any water, which may run down the spokes when the machine is standing, away from the bearings. Lastly, the hub carries a lock nut and washer inside the fork, so that the adjustment is not upset when the wheel is removed for tyre changing purposes.

The Levis hub depends upon the dust cap, which does not cover the end of the hub but fits into a recess, to exclude the dirt. The makers have also found it better to discard oil nipples entirely, and to pack the hub with Price's hub lubricant. At the end of a couple of thousand miles the hub should be cleaned and repacked, but if time does not admit of this, oil can be injected at the sides, after all dirt has been carefully wiped away.

### The Triumph

hub was, until recently, weatherproofed in the same manner as the Norton, but, while that method was perfectly satisfactory at home, it was not found sufficient for despatch riding in Flanders and for the rough usage which machines must experience in the war zone. Therefore the end of the hub is now

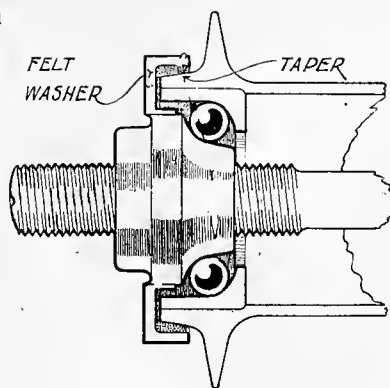
slightly tapered, a shoulder is formed in the dust cap, and a felt ring inserted, which should be very effective, as it checks the dirt at its first point of possible ingress. Another point worthy of mention is that the cones are now made of Ubas steel.

The Indian is a beautifully finished piece of work. It is provided with a knock-out spindle which renders

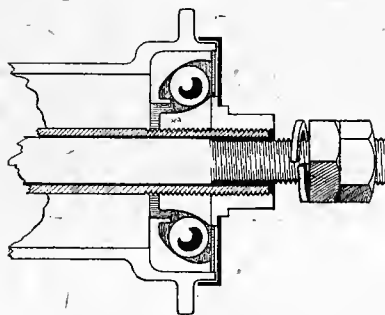
the wheel easily detachable. After the balls are placed in position a flange is forced in over them which answers the triple purpose of excluding dirt, retaining oil, and keeping the balls in position when the cones are removed for cleaning purposes.

A dust cap is fitted at each end of the hub, and if this is filled with grease it should prove most effective. No felt washer has been found necessary.

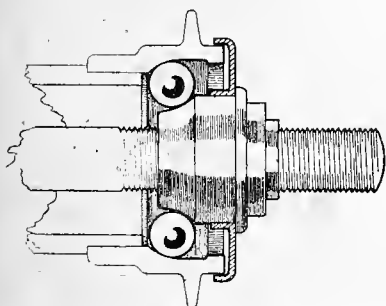
It is not suggested that the few hubs we have illustrated by any means exhaust the examples of meritorious attempts at weatherproofing; for instance, the James Co., whose hub is not illustrated, employ an adjustable Timken bearing on their sidecar outfits. In this the dirt-excluding felt washer is placed much in the same way as in the Lea-Francis. Sufficient has been said, however, to show that the trade is paying attention to this very necessary matter.



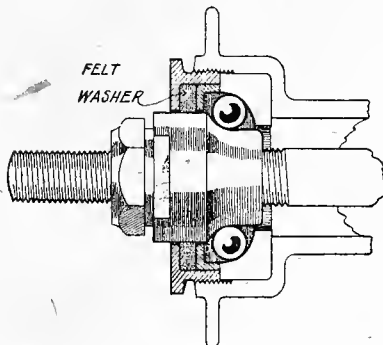
Triumph.



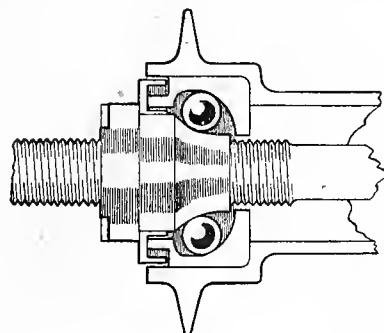
Indian.



Enfield.



Lea-Francis.



Levis.



## SIDECARRING FOR AN INVALID.

How an Inexpensive Outfit brought Health and Strength.

**P**OPULAR prejudice dies slowly, and to the majority of people the sidecar outfit is still an uncomfortable, dangerous, and terrifying vehicle, suited solely for frivolous and foolhardy "flappers," charioteered by break-neck "knuts." The more frequent appearance on our roads of the family outfit, with a lady and two, or even more, children in the sidecar, may do something to dispel the delusion; but if I tell my friends that I bought my sidecar at the doctor's suggestion, for the benefit of my wife's health, the statement is always received with more or less polite incredulity.

As the result of a street accident some years ago, my wife has been rendered delicate and unable to walk more than a very short distance. Influenza last winter increased her weakness, and its after results made her a prisoner indoors, too tired to get out for air, and too delicate for even the lightest of exercise. The doctor insisted that fresh air was needed, and a change of scene and occupation which would brighten the whole outlook, and help the body by cheering the mind. A bathchair was the only seeming solution, but we could not make up our minds to capitulate to that confessed sign of "invalidism." The doctor advised a car, or even a light cycle car, but inexorable ways and means forbade. "Why not try a sidecar, then?" persisted the physician. Here, at least, we were within the bounds of possibility, and we decided to make the attempt.

### Selecting the Machine.

The question was whether for about £60 we could secure an outfit, with an easy riding sidecar, that would hold my wife and small son, aged seven, who refused to be left behind. A big twin-cylinder combination would be too expensive. Would it be fair to load a

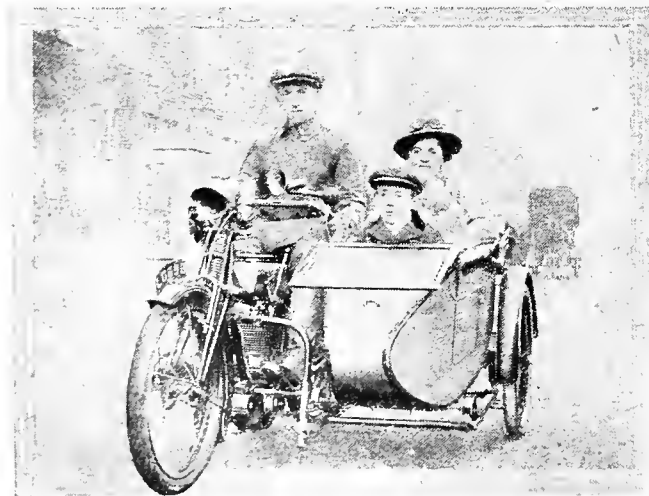


3½ h.p. single to this extent? I finally obtained a Quadrant big single, 4½ h.p., whose 565 c.c. of cylinder capacity gives just that extra pull that we needed compared with the normal 500 c.c. of the standard 3½ h.p. The next question was the sidecar. Could it be made to ride comfortably over the pot-hole pitted tracks that are called roads round London? Could the passenger be kept warm, dry, and sheltered? I obtained a roomy coach-built sidecar, with a body long enough to seat my small son comfortably at my wife's feet. A London firm fitted a windscreen, neat hood, and side curtains. Next came the problem of springing. The ordinary shackles were removed, and I fixed a pair of shock absorbing springs, similar to those fitted on motor cars. They cost 12s. 6d. A couple of air cushions, which I made by simply winding a cycle inner tube inside a cushion case, and moderately inflating it, provides seat and footstool. Thus fitted up we took to the road. We have given the outfit six months' trial, doing 1,200 miles over all sorts of roads. The passenger has had absolute comfort, whilst the heaviest rain has never penetrated the excellent little Cape cart hood. My wife has greatly enjoyed the trips we have made, and is certainly in better health. Small son has become an enthusiast who can recognise every make of motor cycle, and is impatiently awaiting the magic age of fourteen, when a cautious Legislature thinks he may be trusted to hold a licence. He has decided on a Douglas, so at least I am duly informed, and stray pennies are being carefully hoarded with that end in view.

### An Enjoyable Holiday.

The Quadrant engine has given no trouble whatsoever, and with our united weights—24 stone—and the heavy sidecar, has taken every hill, including a gradient of 1 in 5. We do not want high speeds, our average journey being done at about 18 m.p.h., but we have on occasion done "thirty-five" without requiring full throttle. A motor cycling holiday on the South Coast has been the feature of our summer. Choosing a convenient centre, we made daily runs each afternoon. Our distances varied from twenty to forty miles, according to weather and inclination. A Thermos flask of hot tea and a picnic basket made us independent of teashops, and many a glorious picnic we had by the side of the woods or on some upland common.

There must be many who, like myself, desire to



"Quadrider," writer of the accompanying article, and family on the Quadrant outfit.

**Sidecarring for an Invalid.—**

provide an easy and cheap means of locomotion for someone who is not blessed with much health. Let them try the sidecar; and fit it with really efficient spring shock absorbers. They will find it give comfort that is not unfairly to be compared with that of a car. What are the objections? Perhaps the prospective driver is middle-aged. Well, the present writer is approaching that sad fate, and, though an old cyclist, was wholly unaccustomed to motors. Learning to handle an outfit is not difficult. I had only two lessons, and drove with very little awkwardness at the first attempt. Accidents and breakdowns? I have had no accidents (I touch wood humbly!), and although no one is immune from the consequences of the mistakes of others, care and strict observance of the rules of the road will avoid most of the perils.

I have had my share of the incidental troubles of the motor cyclist, but we have yet to be stranded ten miles from nowhere, as most of our friends imagine

will be our daily fate. I was quite inexperienced and an unmechanical person, but I have speedily learned to do all ordinary repairs. I studied the admirable little manuals published by *The Motor Cycle*, and read that journal assiduously, going to the machine itself for practical illustration. I have watched whenever any repair has been executed for me, and it is never waste time. Experience is the best teacher, and even if you fail once, your failure generally helps you to success next time. I have had the joy of succeeding over a job the garage gave up, and one must admit the little triumph was sweet.

To sum up, sidecarring for an invalid is a practical proposition. Get a reliable machine with enough power, spend a little extra on luxuries for the sidecar, and there is no reason why the most delicate should not enjoy the lure of the open road. I can but hope that this article may bring to some other prisoner of ill-health the freedom, happiness, and interest of the glorious sport of motor cycling. **QUADRIDER.**

## SOME NOTES ON THE OPERATION OF TWO-STROKE ENGINES.

Observations and Opinions of a Practical American Designer who has closely followed the Movement.

**O**BSERVING, as I do, the general use of the two-stroke motor in England (as disclosed by a steady perusal of *The Motor Cycle*), especially in the lightweight machines, also in several instances in America, it pains me to read the statements of different contributors to your paper and to the American papers regarding the working of the two-stroke motors.

Now my intention in writing this is to start a controversy, because in so doing we all may learn something. I hope to give the learned and others something to think about for some time to come; yes, and to write about too.

### Many Experimental Engines.

Now, to begin with, I have built several designs of two-stroke motors—some large, some small, in fact as small as  $1\frac{1}{2}$  in. bore  $\times$   $1\frac{3}{4}$  in. stroke ( $38 \times 44\frac{1}{2}$  mm.) two-cylinder two-stroke for aeroplane models, and as large as  $3\frac{3}{4}$  in.  $\times$   $4\frac{1}{2}$  in. ( $95\frac{1}{4} \times 114\frac{1}{4}$  mm.) single-cylinder two-stroke, air-cooled, for motor cycles—and I feel that, on that account, I am in a measure qualified to make statements based on what I believe to be experience, and if I am wrong I am willing to be set right, but “I am from Missouri,” as they say in America, which means I will have to be convinced.

I will also add that I have built two-port motors with spring inlet check valves to crank case; three-port motors, no check valves; two-ports with gear-driven rotary valves; motors with revolving discs to crank case; and two diameter piston two-cylinder motors; so you see that in my experiments I have covered the field very thoroughly, and I will say right here that I found the rotary valve motor as built by me the motor that was most satisfactory and having the greatest possibilities.

Now a common statement made by writers in describing the action of a two-stroke motor is that,

after the charge of gas has been exploded and the piston driven down, the gas taken into the crank case on the up-stroke of the piston is compressed partially, and rushes up into the cylinder, thereby helping to expel the burnt charge of gas. Now I contend and hereby assert that such is not the case, and while I admit that assertion is not proof, I wish for the sake of argument to place the burden of proof on those who may feel disposed to take this matter up.

I will further assert that not only does the new charge not assist in expelling the old gas, but that there is a partial vacuum in the cylinder at that moment, which if taken advantage of assists materially in drawing in the new gas, and it will be found on close study that the essential difference between two motors—one poorly designed and one well designed—is that one takes advantage, either consciously or otherwise, of the aforesaid vacuum, and the other does not.

### Discussion Required.

So you will see that I, for one, do not subscribe to the general idea as stated above, and I sincerely believe that I will find several defenders in the long list of very able writers whose contributions I have had the pleasure of reading in this journal, and if I am successful in drawing these out I feel as though my purpose has been served, and we may cover a new field and spread a more general knowledge of what I consider the most ideal and simplest prime mover ever devised, and at the same time the least understood, and to this end I dedicate these few lines.

WILLIAM E. SLATER.

Will any reader who has devised an advance and retard fitting for the stationary firing point type of Dixie magneto kindly address a description, if possible with drawings, to the Editor?

# CYLINDER COOLING.

## THE GREAT INFLUENCE OF DESIGN AND MATERIAL.

OUR readers will remember that some little while ago—to be precise, on December 23rd, 1915—we published a review of a paper read by Mr. F. W. Lanchester on the important subject of cylinder cooling. This referred largely to the possibilities of air cooling if carried out on the right lines. On January 20th we supplemented this article with some account of auxiliary cooling devices as applied from time to time to motor cycle engines. This discussion has now been carried a step further, for our contemporary, *The Autocar*, published on March 18th an article from the pen of Mr. Granville E. Bradshaw, the talented designer of the A.B.C. motor cycle, which is of so much interest to motor cyclists that we have made many extracts from it for the benefit of our readers. He first relates how he decided that cast iron was by no means ideal for cylinder construction, and describes several methods of attaching cooling flanges to a plain steel cylinder, which were soon discarded. He then proceeds as follows:

Finally, the cylinders were machined from steel bar, with very thin fins of correct shape and spacing formed upon them during the process of machining; subsequently they were annealed to remove all internal stresses, cleaned, and copper-plated on the outside. The results were immediately successful from every point of view. The cylinder was light (the walls being only  $\frac{1}{16}$  in. thick), its capacity for cooling was remarkable, and it was found surprisingly cheap to manufacture. The cylinders were nickel-plated on top of the copper so as not to present an unusual appearance. As a point of design this arrangement is very good, because there is an excellent stiffening rib of steel to carry the copper fin.

The quality of the steel had some considerable effect on the results obtained, but not so much as one would at first expect.

After numerous experiments in this direction, a steel of from 40 to 45 tons ultimate tensile was found which gave the requisite glassy surface to the interior of the cylinder walls under the action of the piston and rings. This steel was reasonable in price, and suited to rapid production and efficient workshop methods.

### Konking made Impossible.

In the first cylinders made, the whole cylinder, including the head, was machined in one piece, and two overhead valves were fitted. These were carried in cast iron cages, of which the valve seatings were a part. Subsequently the valves were tried with their seatings in the steel of the cylinder, with equally excellent results and an absence of pitting. The cylinders had flat heads, with valve gear of the type found in a number of American cars, and shown in fig. 1.

That this design of cylinder was very satisfactory from the point of view of cooling is shown by the fact that a state of affairs had been reached in which it

was difficult to adopt the usual tests on this engine. The early tests had been made in the shape of long runs with very low air-cooling current, and on varying throttle openings from half to full load, then switching off without touching the

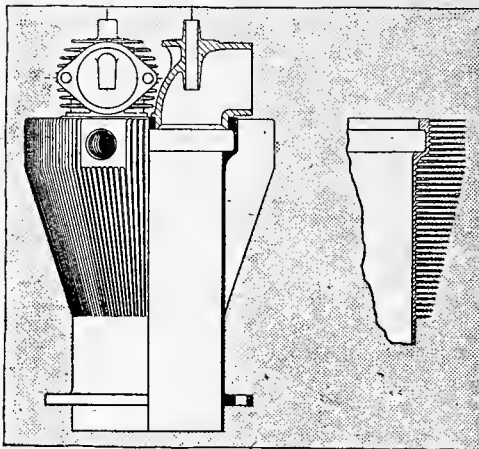


Fig. 1.—Early designs of air-cooled steel cylinders, copper-plated, and—with overhead valves and cast iron cages. The circumferential and axial ribs are alternative designs.

throttle and observing if the mixture would continue to ignite. These tests were altered to one of braking the engine down after a long run till "konking" occurred, but now a state of affairs was reached in which neither test was applicable, as it was found impossible to make the engine "konk" or continue to ignite. The compression ratio was increased, and eventually reached as high a figure as 7—1, which would be considered ab-

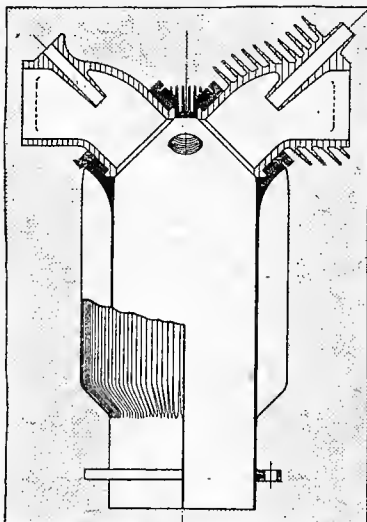


Fig. 2.—A later type of spherically-headed steel cylinder with the valves in cast iron cages.

normal even for the best design of water-cooled engine. Eventually four world's speed records were obtained on Brooklands track with cylinders of this design fitted to motor cycles.

In order to obtain increased power a new type of valve and cylinder head design was evolved. This is shown in fig. 2. In this the cylinder was again made of steel machined from the solid bar, with the combustion chamber hemispherical, and with the cooling ribs milled parallel to the cylinder bore. Cast iron exhaust and inlet cages were held on "V" seatings by large nuts, and an overhead camshaft was used. The design of cylinder, combustion chamber, size and disposition of valves and mechanical details, were all excellent.

It was another consideration, however, which caused the writer to commence radical alterations in design, i.e., public opinion. In air-cooled engines, the prevalent weakness is the breakage of valves. At one time a motor cyclist would have preferred to start his journey minus a tyre repair outfit rather than without a spare exhaust valve. And things are not much better in this respect to-day. Consequently it was found that 90% of the buying public would not use an engine in which a broken valve could fall into the cylinder and try conclusions with the piston head, and despite the fact that a large number of engines had been in the hands of the public for a considerable time, and (with one exception in the case of a purely racing engine) not a single valve had been known to break,\* the design of this particular engine had to be modified.

The exhaust valve had now to be situated in a pocket, in such a way that in the case of breakage the head of the valve could not fall into the cylinder. The only possible way was to fit a cast iron head, or numerous other considerations had to be sacrificed, and finally it was decided to fit superimposed valves with the exhaust valve over the inlet. Common practice with superimposed valves is to fit an overhead inlet valve with the exhaust valve as a side valve, as shown in fig. 3. This design is, however, often unsatisfactory on account of the warping of the cylinder due to the high temperature and the close proximity of the exhaust port to one side of the cylinder wall, and it probably accounts for the falling off in compression of this type of engine when it is hot. These remarks also apply to engines with both valves fitted as side valves.

### The Final Arrangement and the Reasons for it.

With the exhaust valve overhead, as shown in fig. 4, every disadvantage is removed and numerous advantages appear. The hot exhaust outlet (the hottest part of the engine) is taken right away from the cylinder walls and replaced by the cool induction port and valve seating. The exhaust port is, in fact,

\* The design of this valve was described in *The Motor Cycle* for June 3rd, 1915, page 531.

## making the by-ways highways

AN artist with a lively imagination drew this road—but most motor cyclists will be familiar with one very much like it. The boys in France and Flanders know plenty. It is a type of road and condition of surface that would be a positive bugbear if Avon Tyres were not equally well-known, but as things are one can afford to be philosophic and take whatever comes along with a light heart.

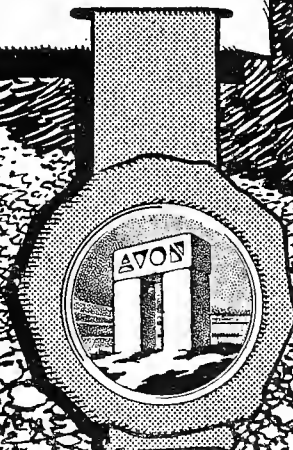
☛ Fitting Avon Tyres is equivalent to carrying one's own permanent way. They "make the by-ways highways" by gripping on all surfaces, neutralising shocks, and resisting, with tough tread and vigorous wall-strength, the lurking agents of destruction that abound on every road—good, bad, or indifferent.

☛ And the clinching argument for Avons is that they serve you at *lowest cost per mile*. No man gets the best out of motor cycling until he fits

# AVON

## TYRES

THE AVON INDIA RUBBER Co., Ltd.,  
19, Newman St., Oxford St., W. Works: Melksham  
and Bradford-on-Avon. Depots: Manchester, Birmingham,  
Glasgow, Bristol, Newcastle, Nottingham, Aberdeen, Swansea, Paris  
*Stockists and Agents everywhere.*



*In answering this advertisement it is desirable to mention "The Motor Cycle."*





Officer: . . . . . You can see the spot I refer to about 200 yards down the road just round the bend. We hadn't a dispatch rider available and the wires were down. It was absolutely essential that somebody should get through with instructions for the battery in action two miles further on. The road was in a terrible state, and as the beggars were searching it with shells at intervals of three minutes, I had to let the old 'bus' go all out. I put it down entirely to the fact that she was shod with Dunlop non-skids that she held a bend like that at such a pace. The tyres stand up to their work splendidly too.

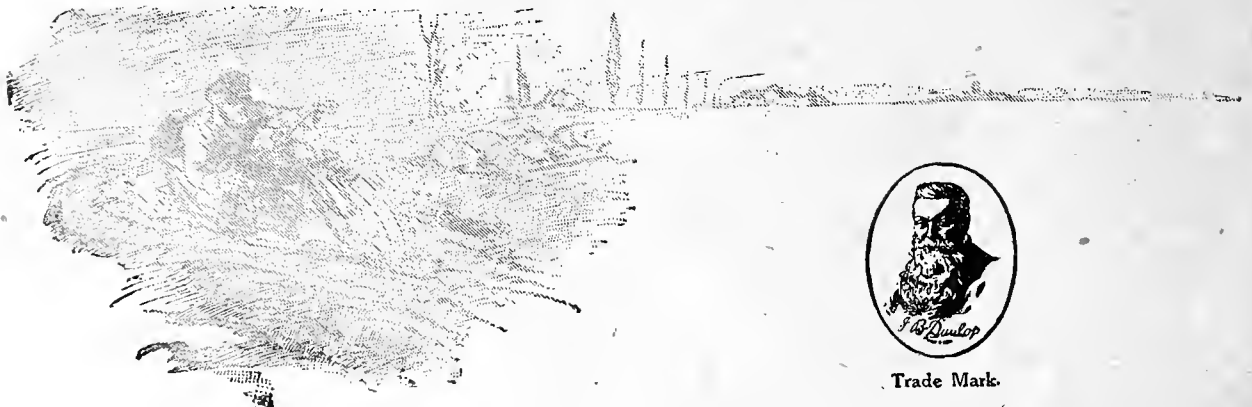
Dunlop: That's most interesting, and only confirms the evidence I am gradually collecting that my patent rubber-studded motor cycle cover is considered *the thing out here*. Much obliged.

Extract from a letter of a motor-cyclist at the front: "We have several 2½ h.p. machines; two were fitted with - - -s and the others with Dunlops. The - - - tyres are worn out and have been replaced by Dunlops. The other Dunlops are still running."

## THE DUNLOP RUBBER CO., LD.,

Founders of the Pneumatic Tyre Industry,

Aston Cross, Birmingham. London—146, Clerkenwell Road, E.C. Branches—Coventry, Nottingham, Leeds, Manchester, Newcastle, Bristol, Liverpool, Glasgow, Dublin, Belfast.



Trade Mark.

**Cylinder Cooling.—**

isolated and in a position where it can have little effect on the heating of the remainder of the cylinder. It has air space all round to obtain the maximum of cooling, it cannot heat the lubricating oil on the cylinder walls, it retains the advantage of the superimposed valve design (*i.e.*, that of the cool inlet gases sweeping over the head of the exhaust valve and reducing its maximum temperature), and both the exhaust valve and its seating are very accessible and can be removed to a bench where they can be

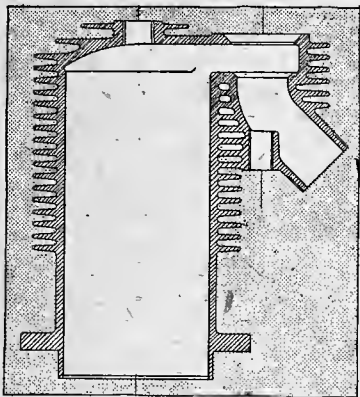


Fig. 3.—A common type of cast iron cylinder with super imposed valves, the exhaust valve being parallel with the bore of the cylinder and the inlet valve overhead.

ground in under better conditions than bending over a hot engine. The position of the sparking plug for cooling and non-oiling up are also worthy of consideration.

This design of cylinder proved to be the most satisfactory in all respects, and, in fact, it appears very difficult to find any serious disadvantages in it. As far as the cylinder walls are concerned, they are assisted in every way, because, instead, as in the case of cast iron, of the fins having to be proportioned so as to render casting possible, they can be correctly proportioned to assist cooling, and made of superior heat-conducting material. They are also perfectly concentric, and, with no lugs or bosses, they are therefore not liable to distortion, so common in air-cooled cast iron cylinders.

This system of cylinder construction has proved so satisfactory that on engines up to 70 mm. bore it has not been found necessary to augment the conductivity of the steel with the copper deposit, consequently there is a considerable saving in cost.

**On Piston Design.**

In designing the piston, particular attention was paid to two points: cooling the head of the piston and maintaining the gudgeon pin and its bearing at a low temperature. Two methods of cooling the piston head are available. One is to use a plentiful supply of oil, which is extravagant, causes a heavy carbon deposit inside the head, and is bad for the rest of the lubrication of the engine, and the other is to conduct the heat away to the cylinder walls. The latter is undoubtedly the better.

In the writer's experience by far the greatest amount of heat is conducted by the piston rings, because these are more continuously in contact with the cylinder than is the piston, and two, three, or four rings are fitted according to the size of the bore. Four or six webs are cast across the piston head to assist in carrying the heat directly from the head to the rings.

 **Webs under the Piston Head.**

Many designers cast a web across the head of the piston and carry this down to the gudgeon pin bosses; this, however, is particularly bad, and the trouble has only to be exaggerated by trying the same design in an efficient air-cooled engine to convince one how bad it is. Even under ordinary circumstances the gudgeon pin bearing is by no means well situated as far as moderate temperature is concerned, and to conduct still more heat directly from the cylinder head to increase its worries is purely farcical. The object, therefore, is to keep the gudgeon pin as far away from the head of the piston as possible, as shown in fig. 5, and have no connecting webs.

**Aluminium Pistons and Cylinder Heads.**

The writer has, during the past few months, been using pistons of cast aluminium, with success in almost all details. For cooling they are excellent, but much more care has to be exercised in order to find the correct clearance, as too much is as bad as too little, but in any case they must be better in steel cylinders in this respect than in cast iron ones. Aluminium has, of course, a higher coefficient of expansion than steel, and, of course, still more so than cast iron. Numerous long tests have been made on full throttle with no cooling fan, and so far the aluminium pistons have not failed in any way.

As a further improvement, cast aluminium cylinder heads are being tried in place of the cast iron ones at present being used; so far the results are not sufficiently satisfactory to record them, but yet it appears that they will eventu-

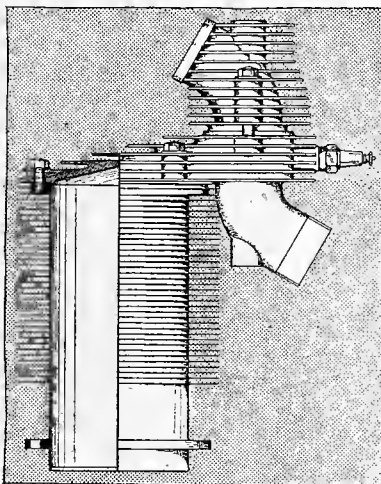


Fig. 4.—A steel cylinder with a cast iron head. The inlet valve is by the side of the cylinder, and the exhaust valve with a detachable seating above the inlet.

ally prove highly satisfactory. The inlet valve seating in the aluminium is successful, and the exhaust valve cage, with its seating integral, will, of course, remain of cast iron.

The experiments that have been referred to include cylinders up to 92 mm. bore, but an engine of 110 mm. bore is being erected, fitted with cylinders of this design.

**Cylinder Attachment.**

A common method of attaching the cylinders to the crank case on an air-cooled engine is by means of long bolts running from the crank case to the

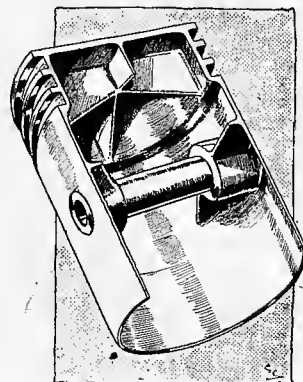


Fig. 5.—A piston for air-cooled engines. Ribs are provided to convey the heat from the head to the piston rings and thence to the cylinder walls. The gudgeon pin bosses are kept well down and well away from the cooling ribs.

cylinder head. This is not good practice on account of the expansion of the cylinder when hot very highly stressing the bolts. The bolts themselves do not expand appreciably because they are comparatively cool, being some distance away from the cylinder, and in one engine the writer has come into contact with it is very usual to see blue flames spitting out of the joint between the cylinder and the cylinder head when starting up from cold. After a little while the flames cease, as the joint is made good by expansion, but, if the bolts are tightened down in the first place, they invariably break.

**Other Factors.**

The subject of direct air cooling is, of course, inexhaustible, and the writer has only touched on a few of the more important points. Of the numerous other details connected with satisfactory air cooling, which through lack of space the writer has not been able to refer to, are (1) valve setting, particularly the early or late opening of the exhaust valve; (2) compression ratio and its effect on fuel consumption; (3) shape of combustion chamber; (4) bore-stroke ratio.

As already implied, the writer is of the opinion that air cooling can be accomplished with as much satisfaction as in the case of water circulation cooling, at any rate up to 30 h.p. in touring cars, and at least 200 h.p. in aeronautical engines.

# THE STURMEY-ARCHER LIGHTWEIGHT GEAR.

A Two-speed Countershaft Dog Clutch Gear Box obtainable with or without a Friction Clutch. Foot Control Adopted.

SOME weeks ago we announced the advent of a SturmeY-Archer two-speed lightweight gear.

The three-speed gear box produced by SturmeY-Archer Gears, Ltd., is now such a well-known and appreciated fitting on medium weight machines that it is not surprising that the company has decided to devote its attention to the production of a gear for the growingly popular lightweight.

Last week we saw the first of these new gears, and had the pleasure of trying it fitted to a two-stroke Sun-V.T.S. lightweight. The new gear is a most compact little unit, scaling but 13 lb. complete, and naturally the benefit of the SturmeY-Archer Co.'s experience in the manufacture of gears has been utilised

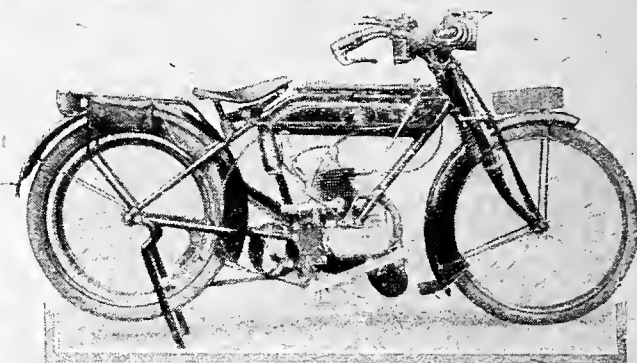
to the full. The most practical point about the gear is the one-piece aluminium casing. Every rider knows the nuisance of a leaky gear box, and a box devoid of joints is likely to remain as clean as a gear box could well be. The new gear is of the usual dog clutch type, and provides two speeds giving a double reduction.

## A Thermoid Plate Clutch.

The gear may be obtained with or without a clutch, as desired, the clutch

when fitted being mounted within the chain wheel. The plates are of Thermoid—which is found superior to cork insets—and permit of any amount of slipping, as we proved by trial. The machine we rode had just returned from a gruelling test over roads deeps in snow and slush in the hands of the designer, Mr. J. Cohen.

The mainshaft of the gear is mounted on a couple of British Skefko bearings, whilst the layshaft is of hardened steel running over a plain hardened and ground steel pin suitably grooved to provide the



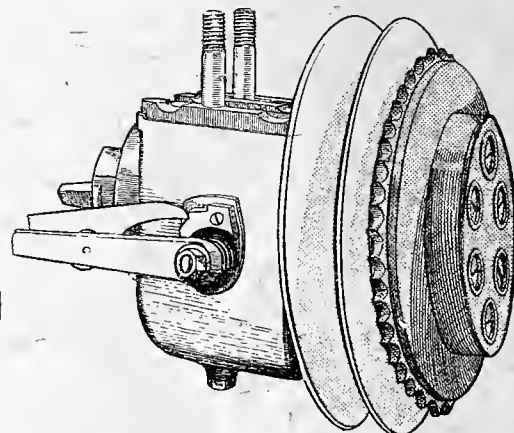
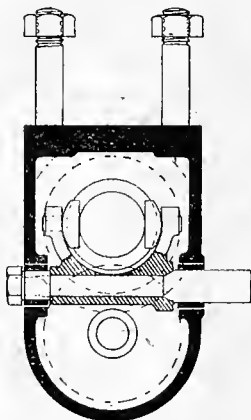
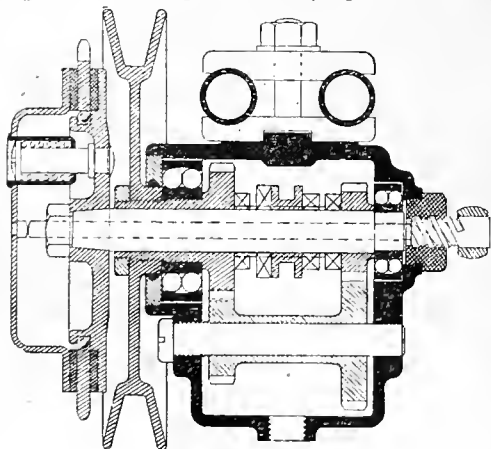
The new SturmeY-Archer two-speed countershaft gear fitted to a Sun-V.T.S. machine.

necessary lubrication. Advantage is taken of the opportunity of fitting a large driving pulley, so that the ideal of pulleys of equal size is brought nearer.

## The Method of Changing.

The control of the gear is by a pedal and trigger arrangement, though the method adopted on the fore-runner of the type is to be slightly amended in future specimens. At the present time there is a medium-sized pedal with a tiny trigger engaging in a ratchet. Pressing the main pedal engages the low gear, and on releasing the trigger the top gear is obtained. A similar arrangement, but much more substantial in its construction and positive in its working, is to be standardised. We were glad to note the adoption of foot control, as any method which does not necessitate releasing the handle-bars is to be preferred, particularly on slippery roads.

The gear is suspended from the bottom bracket in the usual manner by two stout studs passing through a plate clamped to the chain stays. A kick-starter is not favoured by the SturmeY-Archer designer for the lightweight gear; indeed, we were told that rather than put up with the added weight of the kick-starter mechanism a third speed would be preferred, in which view we heartily concur.



Sectional views of the new SturmeY-Archer two-speed lightweight gear.

Exterior view of the complete gear and clutch showing compact appearance.

# "THE MOTOR CYCLE" RECRUITING SECTION.

Central Office for Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

## Record Number of Recruits for the Motor Machine Gun Service Last Week; over 200 Motor Cyclists Accepted.

THE anticipations of a record number of recruits for the M.M.G.S. last week were realised. On Tuesday over 150 men attended the Coventry Recruiting Office for examination, and of these 120 passed the test. The last man was not examined until after 8 p.m. Further batches of candidates were inspected in Nottingham on Wednesday and London on Saturday last.

In the latest list of recruits are included the names of Edgar Willis (who has two brothers already serving in the M.M.G.S., viz., Sgt.-Maj. G. Willis and Sgt. Willis), L. R. Pipe, organist and music master to the Duke of Newcastle, and Councillor A. C. Bannington, of Coventry, who was a member of the local Appeal Tribunal. Councillor Bannington owns a Triumph sidecar outfit, and is a builder by trade.

A large number of Colonials have attended the inspections of the M.M.G.S. from time to time, and are now serving in this branch of the Service. The latest addition to the ranks is W. M. S. Taylor, of Cambuslang, who paid his own expenses from Nyassaland specially to join the Colours.

An inspection of recruits was arranged for Tuesday afternoon this week, and there will be a further inspection on Tuesday afternoon next, the 4th prox., at the Coventry Recruiting Office, Masonic Buildings, 11 a.m. to 5 p.m.

Provided there are sufficient applications from the London district and South of England to warrant it, the Editor, Mr. Geoffrey Smith, will attend at *The Motor Cycle* offices, 20, Tudor Street, London, E.C.; on Saturday afternoon, the 8th April. A definite announcement on this point will be made in the next issue of this journal, when more is known of the number of vacancies still existing.

All recruits for the M.M.G.S. pass through the Editor's hands, and in applying men living at a distance should enclose two references. Motor cyclists and a limited number of car drivers are wanted. Application should be made in the first instance on the usual printed form (see last week's issue, page 279).



*The Motor Cycle* in a dug-out. The latter is well equipped, being fitted with a fireplace, mantelshelf, and acetylene gas lighting. All cooking is done by means of Primus stoves, two of which can be seen on the mantelshelf. We have to thank Pte. E. M. Oliver, formerly a prominent member of the Purley and District M.C.C., who is reading the paper, for the photograph.

A list of recruits passed by Mr. G. Smith last week in Coventry, Nottingham, and London is appended:

Acock, R. J., Cheltenham.	Jacobs, S., Hull.
Ardley, F., Rotherham.	Jarrard, H. W., Birmingham.
Allen, F. A., Hampton (Middlesex).	Jeffels, A. J., Northallerton.
Armistead, J., Golder's Green.	Jeffrey, H. S., Northampton.
Asker, E., Nottingham.	Johanson, R. V., Castle Douglas, N.B.
Atkins, W. W., Coventry.	Johanson, W. R., New Malden.
Ayres, F., Birmingham.	Johanson, W. N., Birmingham.
Bailey, R., Lichfield.	Keyes, F. C., Bath.
Baines, J. R., Kettering.	Kibble, J. T., Durham.
Baldwin, D., Tow Law.	King, P. J., Wells.
Bannington, A. C., Coventry.	King, J. C., Northampton.
Barker, C. M., London.	Leahey, G., Tow Law.
Barker, R., Birmingham.	Lee, J. R., Prudhoe-on-Tyne.
Barlow, T. W., Tow Law.	Kettel, A., London.
Barraard, A., London.	Levy, E. A., Charlton.
Barrow, N. V., Didsbury.	Lewer, E. H., London.
Battist, H., London.	Lloyd, H. A., Stoke-on-Trent.
Beck, P. E., Long Litchington.	Loog, A., Woolwich.
Beeson, P., London.	Love, F. W., Stratford-on-Avon.
Bender, B., Westcliff.	Lovegrove, O. J., Windsor.
Beren, B., London.	Lowe, G. R., Harrogate.
Beraud, T. H., Colchester.	Ludlow, E. R., Birkfields.
Berou, A., Coventry.	Marles, J., Redditch.
Billam, J. M., Nottingham.	May, N. G., Barn Green.
Blackham, E., Woking.	Mays, F. C., Ilford.
Blackmore, J., Peckham.	Merrison, E. C., Norwich.
Blaed, G. H., London.	Millington, A. R., Newport, Moa.
Bollard, C., Ashby-de-la-Zouch.	Mitchell, T. G., Melrose, N.B.
Booth, J. A., Rochdale.	Mobbs, E. S., Chester.
Bosworth, A. J., Kettering.	Moore, L., London.
Bosworth, J. H., Nottingham.	Moroney, W. T., East Ham.
Bradley, H. W., Derby.	Moss, G., Manchester.
Bransfield, A. W. J., St. Albans.	Bloss, S. A., East Dulwich.
Brett, L. G. H., St. Leonards-on-Sea.	Mossop, G., Loogton (Cumb).
Brookwell, W. B., Purley.	Moulding, A. F., Woking.
Brooks, J. T., Sawley.	Moulding, L. A., Woking.
Brown, H., Colne.	Moxon, H. G., Coventry.
Buchanan, J., Twickenham.	Naylor, G. G., Sheffield.
Bull, C. F., Bridgnorth.	Neal, W. M., Winslow.
Burgess, R. J., Ashford.	Newell, C., Birmingham.
Burrell, A. E., Peckham.	Newington, E., Tunbridge Wells.
Butterworth, W., Bury.	Nowlan, W. J., London.
Cantrill, E. W., Northampton.	Parker, J. R., Leadgate.
Cartmou, F., Jr., Bury.	Pautard, J., London.
Chadd, W. A., Camberwell.	Pegg, A., London.
Clarke, G. J., Loodon.	Perkins, F. L., Gosport.
Clarke, I. J., Ryhope.	Peters, C., West Wickham.
Clancy, J., Glasgow.	Phillips, T. J., Leicester.
Clay, A., Ilkeston.	Picken, A. C., Rugby.
Clayton, W., Cardiff.	Pickles, R., Barnoldswick.
Clegg, W. T., Bournemouth.	Pickup, F., Blackpool.
Collett, P. G., Erith.	Pike, H. L., Worsop.
Cook, G., Peckham.	Piper, W. H., Oxford.
Cook, J., Ilkeston.	Pritchard, R. J., Nottingham.
Cooper, P., Edmonton.	Pulford, G. F., Wood Green.
Cooper, W. S., London.	Pye, F. O., Muswell Hill.
Cornell, F. J., Cobham.	Ray, F., Sheffield.
Cornish, F. J., Brondesbury.	Reeve, L., Birmingham.
Cowbourne, F., Shipley.	Robertshaw, C. W., Banksfield.
Cozens, G. W., Taunton.	Rogers, G. J., Bedminster.
Craig, F. T., Brechin.	Rollinson, T., Nottingham.
Cromack, T., South Hackney.	Rowbottom, H., Chadderton.
Dale, F. J., Uttroter.	Scott, L. J., Consett.
Deeming, G. E., Polsworth.	Shelton, H., Willicote.
Divall, F. E., Tunbridge Wells.	Shelton, W. G., Birmingham.
Dodd, J. H., Leek.	Smith, E., Birmingham.
Dod, H., Crieft.	Smith, R., Harwood.
Dorrington, P. E., Seasalter.	Smith, W. C., Dacre Park.
Duddridge, H., Bridgewater.	Starkey, J. B., Bulwell.
Duocan, J., Clydebank.	Stonebridge, R. A., Bicester.
Fagg, G. W., Ashford.	Strao, P. W., York.
Fidge, L., Brighton.	Tate, R., Suderlaid.
Filow, C. C., Acton.	Taylor, A. E., Dindley.
Fisher, H. M. G., Hull.	Taylor, E., Shady Bridge.
Fletcher, S. S., Ilkeston.	Taylor, W. M. S., Cambuslang.
Foreman, G., Southwark.	Teedle, D. B., Longton (Cumb).
Franklin, C., Cheltenham.	Thompson, D. J., Liverpool.
Gamble, N. N., Sheffield.	Tolson, J., Workington.
Gardiner, D. J., Llanabon.	Tucker, H., Enfield.
Garner, G. H., Hove.	Turner, E., Halifax.
Garner, J. H., Looe Eaton.	Twitchell, W. R., St. Albans.
Gibb, W. I., Galashiels.	Uwina, F., Umbridge.
Gibbons, H. A., Croydon.	Ventem, W. P. J., Streatham.
Gibson, R. R., Bootle.	Vinson, G. K., Canterbury.
Gonld, F. P., Brierley Hill.	Wakefield, A. E., Coventry.
Gouldstone, T. E., Maidstone.	Waller, R. W., Ludlow.
Gradage, E., Ouchan, I.O.M.	Wallis, H. W., Bourne.
Gurd, H. W., Bournemouth.	Walmsley, J., Darwen.
Haggard, R. C., London.	Walton, J., Blackburn.
Haidley, H., Stourbridge.	Waterfield, E. W., Leicester.
Hart, H., Lichfield.	Weston, C. L., Harrow.
Hart, J. H., Didsbury.	White, N., Sheffield.
Haslett, C. F., Coventry.	White, C. R., Catford.
Hawthorne, F. H., Kettering.	White, J. A., Grays.
Heath, C. J., South Farnborough.	Willis, E., Tooting Bec.
Hollister, C., Sheffield.	Wymaa, W., Edmonton.
Holmes, A., Chesterfield.	Yull, R., Larnark.
Hunt, S., Plymouth.	



# WAR TIME ACTIVITIES OF THE A.C.U.

As Revealed by a Perusal of the Thirteenth Annual Report.

THE Auto Cycle Union has, as is well known, done yeoman service to the country in acting first of all as the office of the London District Motor Cycle Reserve Committee, the whole of the work of which was done by the A.C.U. staff, and up to December last 6,400 applications for enlistment were dealt with. In January last the secretary was placed in charge of the Central Office Motor Cyclists' Reserve Committee, R.E., with its headquarters at the offices of the A.C.U. No fewer than 1,160 men called for advice at the Central Office during the first six weeks of its existence.

The A.C.U. has also been of assistance to other Government departments in connection with matters arising out of the war, and is represented on the

Central Committee for Employment of Discharged Soldiers and Sailors connected with the motor industry. It is hoped that, through this Association, no motor cyclist who has served his country ashore or afloat during the present war may lack employment when peace is declared.

With regard to membership, early in the war the committee agreed that any member who by reason of his being away on Service could not conveniently remit his subscription should be made an honorary member. Over a thousand members have availed themselves of this offer. One thousand eight hundred and seventy-nine new members joined during the year. In accordance with the policy of making all possible concessions during these difficult times, the committee re-

vised the rules as regards membership, and from July 1st, 1915, any new member joining the Union is entitled to twelve months' benefits for the one subscription whenever paid. It was further agreed that members availing themselves of the full recommended insurance policy be admitted to touring membership without payment of the annual subscription, whilst the radius from London, outside which full members are entitled to the reduced "country" rate of subscription, has been reduced from thirty to twenty miles.

Advice was given to numerous members as regards routes and journeys during 1915. The Legal Department has had plenty of work to do, though less than in times of peace, while the Insurance Department has been particularly active.

## PROHIBITION OF MOTOR CYCLE IMPORTS.

What the Importers Think.

WE have lately taken the opportunity of getting the views of some of the leading firms who deal in American motor cycles in this country concerning the recent prohibition of the import of foreign machines. Mr. Duncan Watson, the managing director of the Harley-Davidson Motor Co., pointed out that his firm re-exported motor cycles to every country except the United States, consequently the loss of the home market would not be a very serious matter to them. His firm was in such a position that all contracts entered into by them and sealed by the Board would be met. The only difficulty would be in the way of obtaining new business. Nevertheless, these contracts covered the ground pretty fully, and so they did not anticipate any great trouble. They have been, and are, specialising for this season on sidecarriers, of which they have had a number on trial, and these have proved themselves to be eminently satisfactory, and quite capable of meeting the regular demands of tradesmen who resort to this up-to-date method of delivering their goods.

The agents for American motor bicycles over here are naturally hard hit over the recent Order in Council forbidding any further imports of machines. Fortunately, most of them



A B.S.A. IN FRANCE.

A T.T. B.S.A. used by M. C. Dietz, attached to a French A.S.C. Supply Column, which has been used since the beginning of the campaign on the worst roads on the Belgian front. M. Dietz fitted the engine with a very neat valve cover.

have a very fair stock and plenty of spare parts, so that there will be still for some time a limited number of machines for sale. It may not be generally realised that the Order in Council prohibits the import of spare parts and accessories as well as complete motor cycles. This would, of course, press somewhat hardly upon riders of American machines except for the fact that agents hold large stocks of spares. A few of the firms will endeavour to import sidecarriers. These facts have been gathered after visiting the Reading Standard Motor Cycle Co., Messrs. Harris and Co. (Excelsior), the Hendee Manufacturing Co. (Indian), and the Pope Motor Cycle Agency.

Exemption from Duty for Tourists.

Last Friday's *Gazette* contained the announcement that the Treasury will, at the expiration of forty days, make regulations providing for the total or partial exemption for a limited period from the new import duty of any cars and motor cycles brought into Great Britain or Ireland by persons making only a temporary stay therein.

## NEWS FROM AUSTRALIA.

THE Canberra Motor Cycle Club of New South Wales held a 100 miles road race at Hartley on January 26th. The course was a circular one of three and three-quarter miles to the lap, and the event was based on a handicap. The first three places were secured as follow:

1. B. Wickham (8 h.p. American Excelsior)
  2. F. J. Berry (2½ h.p. Douglas).
  3. G. Pellet (3½ h.p. Douglas).
- The winner, we are informed, had 2m. start of Millar (Douglas), who was doing remarkably well until put out of the running by punctures.

The entry fees were paid over to the

St. John Ambulance Wounded Soldiers' Fund, Randwick Division.

The 24 Hours Record.

The latest copy to hand of *The Australian Motorist* provides an amount of interesting information concerning Erwin Baker's long distance road record, cabled reports of which appeared in *The Motor Cycle* of February 10th and 24th. Erwin Baker is an American rider of a Powerplus Indian, and during a visit to Australia he has put up many records, the most important of which is the twenty-four hours.

For the latter he used a circular course of 33.9 miles, known as the Mortlake

circuit, and situated in Western Victoria. It is perhaps the most suitable road for such a purpose in the Commonwealth, and is often used by the Victorian M.C.C. of Melbourne.

Baker had not the best of fortune, and he had three shots at the record, in the last of which he covered 1,027 miles in 21½ hours. At this distance a fracture of the oil tank occurred and the ride came to an end, but not before the object aimed at had been successfully secured. The average speed, including all stops, is 48.2 m.p.h. It was a magnificent ride, and Erwin Baker has returned to the United States very pleased with the results of his visit.

## MILITARY NOTES.

## MOTOR CYCLISTS IN THE R.F.C.

IN the early days of the war motor cyclists distinguished themselves, as was natural, chiefly in the signal section of the Royal Engineers, and still continue to do valuable work, though not quite so thrilling, unless there is a "move." In this branch of the service, as in others, they excel as motor cyclists.

As we have often pointed out, motor cycle riding teaches a man self-reliance and quickness of intellect, brought about by a perfect understanding between man and machine; it gives him a sure eye and braces his nerves, and so renders him suitable for a multitude of duties. Naturally, these qualifications are eminently suitable for work in the popular R.F.C. So many of our leading naval and military pilots were and are skilled motor cyclists. T. Sopwith was one in his early youth; Victor Wilberforce, R.N., another; A. V. Roe; Graham Price, whose death we reported in our last issue; M. A. J. Orde, concerning whom there is, alas! no further news, though it is hoped that he has made a landing somewhere in enemy territory. Then there is Capt. A. M. Low, whose work in the technical branch of the R.F.C. recently earned him promotion in less than a year from Sec.-Lt. to Capt.; O. C. Godfrey, who has just been gazetted to a commission; and R. L. Keller. Keller, a member of the P.S.M.C.C., has seen much fighting. He was granted a commission early in the war in the Warwickshire Regiment, was wounded in July last, and has now been transferred to the R.F.C.

## DESPATCH RIDING WORK IN MIDDLESEX.

AFTER the many items of news concerning the work of despatch riders in the different war zones that have appeared from time to time in *The Motor Cycle*, it is quite home-like to hear from a man who, with a couple of comrades, does work of this description in London and district.

Ptes. Coldham, Chisholm, and Pawsey are attached to a Mechanical Transport depot located near Sunbury-on-Thames, and two journeys to town have to be made daily, irrespective of numerous other runs. Most of their work lies in

the Metropolitan area, and whereas despatch riders in France spend part of their time avoiding shell holes, these men spend part of their time when on duty in avoiding, so far as possible, police traps. There is a good deal of night and heavy traffic riding, so that the work is not so easy as it might appear at first sight. Also, the very bad condition of the roads locally, due to the heavy lorry traffic, makes it a severe test for both riders and machines.

## SUPER-KEENNESS OF COLONIALS.

THE keenness of the average Colonial to do "his bit" has been one of the outstanding features of the war. A typical instance is that of D. Leslie, of Port Elizabeth, who at the end of last year wrote to the editor of *The Motor Cycle* for particulars of enlistment in the M.M.G.S. and R.E. despatch riders. The necessary



## DESPATCH RIDERS ATTACHED TO AN A.S.C., M.T. COLUMN

From left to right: Ptes. Coldham (2½ h.p. Douglas), Chisholm (4 h.p. Triumph), and Pawsey (2½ h.p. Douglas). Since the photograph was taken the two 2½ h.p. Douglases have been replaced by a 3½ h.p. Rudge Multi and a 4 h.p. two-speed Douglas.

## STATIONED ON EAST COAST.

IT is not often we give pictures of despatch riders on service in England for the simple reason that the great majority of men enlisted as despatch riders are for service abroad. The eleven riders shown in the large illustration on this page have been engaged on military duty at home for some time, but they are all keen to go abroad. All the machines, we are informed, have stood up exceedingly well, despite the far from ideal conditions prevailing on the East Coast.

particulars were sent immediately, but Leslie, who disliked the slightest delay, enlisted meanwhile as a despatch rider for the German East African campaign, and the last we heard of him was in a letter dated February 27th, when he was en route for German East Africa with fifty other motor cyclists. When General Smuts's campaign is over, and if the European campaign is not finished, Leslie intends renewing his application for enlistment here either in the M.M.G.S. or the R.E.



## A SECTION OF R.E. DESPATCH RIDERS STATIONED ON THE EAST COAST OF ENGLAND.

From left to right—L.-Cpls. G. L. Fawdon (Indian), J. Warden (Triumph), R. R. Watson (Douglas), E. M. S. Davison (Douglas), R. E. Simpson (Triumph), Lt. G. W. Turnbull (Triumph), L.-Cpls. G. W. Urwin, R. W. Robinson, T. E. Raw, R. Butler, and Cpl. Glaholm on Triumphs.



### TIMES TO LIGHT LAMPS. (GREENWICH TIME).

Mar. 30	...	...	6.57 p.m.
April 1	...	...	7.0 "
" 3	...	...	7.3 "
" 5	...	...	7.6 "

### A Fortnight Hence.

Thursday, April 13th, is the date of the annual spring number of *The Motor Cycle*.

### Time Squared.

Next month a contemporary announces that it will hold a public schools' championship. The formula mentioned is that of *The Motor Cycle*—the figures, though disguised, will give the same result.

### The National War Funds.

At the week-end the principal relief funds stood as follows:

The Prince of Wales's National Relief Fund (£3,073,000 distributed) .. .. .	£5,836,093	0	0
Fund for the Sick and Wounded .. .. .	3,567,085	0	0
Tobacco Fund .. .. .	102,557	0	0
The Queen's Work for Women Fund .. .. .	168,731	5	10



### PREPARED FOR ANY WEATHER!

Mrs. F. C. Skidmore, of Ealing, who has quite recently taken to motor cycling, and who thoroughly enjoys driving her husband's A.B.C. sidecar. The becoming, and at the same time completely storm-resisting, outfit worn by Mrs. Skidmore will meet with the approval of our lady readers.

### A Californian Trial.

There were forty-two starters in a trial for motor cyclists from San Francisco to San José held last month. Thirty-seven riders completed the course, and twenty-seven of these (including the Harley-Davidson sidecar team) came through with perfect scores.

### Lantern Slides with the Grand Fleet.

*The Motor Cycle* series of lantern slides, which have been with the Grand Fleet for some months past, have now passed from one to the other of the ships of the First Cruiser Squadron, and a letter from Rear-Admiral Sir Robert K. Arbuthnot, Bart., mentions how much the slides have been appreciated by officers and men.

### Liverpool Motor Volunteers.

A new squadron of the National Motor Volunteers, Port of Liverpool Centre, is in course of formation, and the following vehicles (and drivers thereof) are required: Twenty-four motor waggons, eight cars, and twelve motor cycles. Car drivers and motor cyclists in the Liverpool district who are prepared to join should write to Mr. J. Graham Reece, 22, Rodney Street, Liverpool. The following are eligible: Men not of military age, men who have been medically refused, or those attested and not yet called up.

### So-called Pleasure Motoring.

The General Committee of the Royal Automobile and Associated Clubs representing all car and motor cycle organisations in the country, has addressed to the National Organising Committee for War Savings, the Ministry of Munitions, and the War Office a protest against the manner in which the appeal of the first-named, relating to the use of cars and motor cycles for pleasure, was framed.

Generous extracts from the letter appeared in the daily press last week, so it is only necessary to add that the points brought forward by the committee of the Royal Automobile and Associated Clubs agree with the sentiments on the same subject that have been expressed in recent numbers of *The Motor Cycle*.



### FOUR DESPATCH RIDERS WHO SERBIAN OPERATIONS

The photograph was taken last month  
A. S. Ashmore, A. P.

### Fat Sparks of Optimism.

Dan R. Walls is the name of the publicity manager of the Splitdorf Electrical Co. makers of the American Dixie magnetos. According to an American contemporary he is known among his friends as "Dixie Dan," because he radiates fat sparks of optimism.

### Advice Wanted.

A South African correspondent asks our readers to recommend him a carburettor which will give satisfactory results on a 7 h.p. Matchless (1914). We should say that all well-known carburettors would give good results, though some are better in or respect, others in another, and our correspondent does not say in what manner the original carburettor failed to come up to his ideas.

### Exports of American Motor Cycles.

Figures issued by the U.S. Department of Commerce relating to exports from the United States of motor cycles in 1915, 1914 and 1913 show clearly the trade obtained by the Americans due to British motor cycle manufacturers being engaged on munition.

The numbers exported are:		
1915	...	14,836
1914	...	6,556
1913	...	4,131

### Hoarding Petrol.

Evidence that unpatriotic people are "grabbing" petrol was given in two police cases, instituted under the Defence of the Realm Act, at the Jersey Royal Court on Saturday last. A Government contractor was fined the maximum penalty of £100 for illegal storage of petrol at stables in St. Helier and £50 for a similar offence at farm. An order was made for the confiscation of 464 gallons of petrol.

The second case was that of an agent fined £100 for allowing petrol to be carted to uncertified stores.

### Unusual Collision leads to Legal Proceedings.

A somewhat unusual type of accident led to a law case at Edinburgh last week, where two variety artistes, who travel from theatre to theatre by motor cycle, sued the driver of a car for damage. Plaintiffs were sheltering under a bridge during a thunderstorm with their machines on the side walk. It was stated that defendant, driving his car at a dangerous speed, mounted the side walk and ran into one of the plaintiffs and the two motor cycles. Defendant maintained that he was travelling at a safe speed, and that the machines were so placed as to make



PART IN THE WHOLE OF THE LATTER END OF 1915.

From left to right: P. Collins, and T. G. Quinney.

A trap for a south-going car. The jury found for plaintiffs, and awarded £85 for personal injuries and damage to machines.

#### Sidelight on So-called Pleasure Motoring.

An instructive sidelight is thrown on the question as to who are at present the chief road users by the applications for A.A. membership. Sixty per cent. of such new members are military and naval users of cars and motor cycles. At the same time, any special work the Association is called upon to do for private motorists using their cars for rival purposes is negligible.

#### Tuesday's Gale.

Those motor cyclists who use their machines or getting to and from business daily must have had a rough time in the blizzard on Tuesday morning this week. Riding, even when possible, was most dangerous on account of fallen trees and telegraph posts across the road. Sidecarriers regularly ply between Valsall, Wolverhampton, Birmingham, and Coventry in the interests of manufacturers in the district, but Tuesday's gale put a stop to all forms of traffic for a time. In more than one section a whole series of telegraph poles had been blown down and lay across the road—an effectual barrier. One of our staff, who wisely left his motor cycle at home, climbed six fallen trees in a distance of about a quarter of a mile, or a little more.

#### With the British Red Cross in Italy.

We have received an interesting communication from a motor cyclist attached to the British Red Cross Society in the Carnic Alps. He is anxious to try one or two motor cycles fitted with sidecar ambulances, which he thinks would be cheaper to run, and would be able to reach places impossible for cars. The roads are narrow and very bad, with long, but not very steep, gradients. He wisely thinks a 6 h.p. chain-driven twin with three-speed countershaft gear would be the most suitable mount. He is at present using one of the latest pattern triumphs, which he uses to go to the various utility stations, some of which are situated high up in the mountains. His duties consist of taking the mails, small parcels, and small parcels, and, at the same time, collecting reports. The machine, he says, is the envy of the Italian riders, and has behaved magnificently, although the riding conditions are most difficult, as at times he has to cross streams by wading, pushing the machine. Some of the roads, he tells us, are just like a bed of a river, consisting as they do of rolled stones.

#### Proposed Johannesburg Training Association.

The committee of the Pretoria Motor Club has had under consideration for some time the formation of a military training association for those members not on active service. The recent heavy recruiting for the German East African campaign has hindered matters, but by now, we gather from the hon. secretary, Mr. D. Hyams, matters may have taken more definite shape.

#### Melbourne to Sydney Record.

According to cablegrams published in the daily press at the beginning of this week, a Mr. Edkins has motored from Melbourne to Sydney, a distance of about 580 miles, in 16h. 45m. This gives an average of just over thirty-four miles an hour, a remarkable speed for such a distance and such a road. It will be interesting to have details and to see whether the run was made by motor cycle or car.

#### Street Accidents in 1915.

No fewer than sixty-three deaths caused by street accidents were investigated by Dr. Waldo, His Majesty's coroner for the City of London and Southwark, during 1915. This constitutes a record, and is seventeen in excess of the number registered during the previous year. Many suggestions have been made by juries with a view to lessening the loss of life, among which are the following:

That during lighting-up time a regulation be made and enforced, restricting the speed of vehicles to a maximum of 10 m.p.h.

That the construction of the front part of steam lorries should be altered in such a manner that the driver may be able to see and direct his course with greater precision than at present and so avoid the danger of collision with other users of the road.

It is pointed out that a large percentage of the fatalities are due to the careless disregard of pedestrians for their own safety.



#### SPECIAL FEATURES.

WEATHERPROOF HUBS (Illustrated).

SIDECARRING FOR AN INVALID.

NEW STURMEY-ARCHER LIGHTWEIGHT GEAR.

#### What of the Budget?

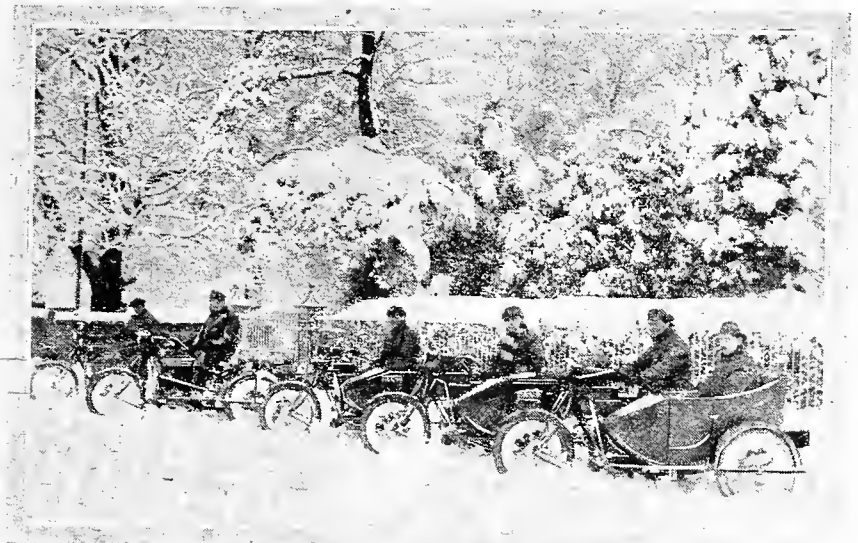
How will the import prohibition affect second-hand prices? In view of the fact that comparatively few motor cycles are now being produced by home manufacturers, it is extremely likely that the prices will be enhanced, but then, what of the Budget?

#### Why Single Out Motorists?

"Don't use a motor car for pleasure" runs a huge poster in the Admiralty archway in Whitehall. We suggest that the R.A.C. or A.C.U. erect a similar one in Pall Mall, "Don't go to the theatre for pleasure." Just why there is this dead set against motorists on unproved evidence it is difficult to say.

#### Something to Think About.

If the taxes on motor vehicles are doubled, will the Government take into consideration the value and comparatively low power (with a consequent minimum of road wear) of old pattern motor cycles and cars? If not, some vehicles will have a value very little in excess of the yearly tax.



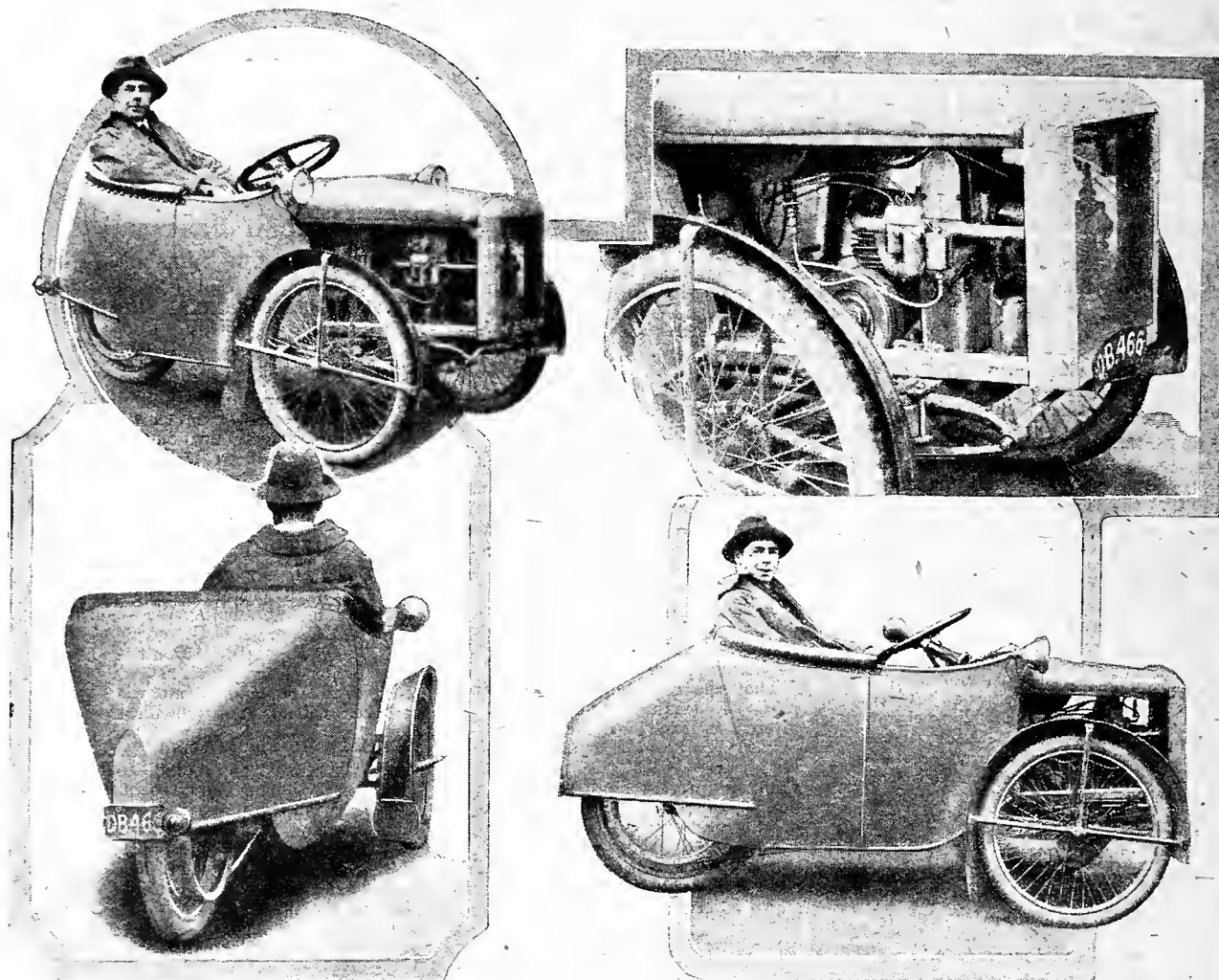
#### TESTING UNDER DIFFICULTIES.

War Office Clynos under test during a recent snowstorm. From left to right, the riders are E. Walton, W. S. Life, J. Bowyer, J. Riley, and F. Jenkins.



# NOVEL HOME-MADE CYCLE CAR.

A Simple Two-seater with  $3\frac{1}{2}$  h.p. Douglas Engine and Gear Box.



A three-wheeler built by Mr. Elverstone in his spare time. The power unit is a  $3\frac{1}{2}$  h.p. Douglas motor cycle engine.

THE rather novel and ingenious tricar illustrated has been made by Mr. Elverstone, who is an enthusiastic Manchester amateur. The chassis is tubular and is supported in front on semi-elliptic springs, while the rear wheel is unsprung. The engine and gear box are those taken from the owner's  $3\frac{1}{2}$  h.p. Douglas, which are placed lengthways in the front of the chassis. They are equally balanced over the front axle, where they are securely attached to a wooden platform.

## Engine Started from Driver's Seat.

The drive is taken direct from the gear box, which is situated directly behind the engine, to the rear wheel by a rather long belt drive. A dummy wire radiator is placed in front, while the petrol is carried in a cylindrical tank above the engine.

By an ingenious extension of the kick-starter pedal the engine can be started from the driver's seat. Brakes are fitted to all three wheels, the front being the original hand brake of the motor cycle and the

rear one acting on the belt rim in the usual manner. All brakes are, however, operated by the feet. The wheel steering is connected up direct without any gearing down.

Quite a roomy two-seated body is fitted, the back being extended in a streamline shape well over the rear wheel; this back should prove a most efficient mudguard. The owner tells us that he finds the outfit more comfortable than a sidecar outfit, while there is no appreciable difference in the petrol consumption between the two types.

## LOST AND FOUND.

We receive many letters regarding accessories, etc., both "Lost" and "Found," which we are unable to find space for. As these particular matters are of interest to two persons only, viz., the finder and the loser, we keep a list of such articles, and all that are notified to us are inserted in this list. Should we receive a letter from the finder which corresponds to the article lost, the two persons are put into communication, but it must clearly be understood that we cannot enter into correspondence on the matter beyond this.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

#### How Many Motor Cycles?

Sir,—I have collected 200 names of different makes of motor cycles. Can you tell me how many there are altogether? My favourite day in the week is Thursday, when I get *The Motor Cycle*. I used to get a comic paper, now I buy *The Motor Cycle* with my penny. My father has a Quadrant. When I am fourteen I shall have either a T.T. Zenith, or a T.T. Rudge-Multi, or a T.T. Douglas.

JACK WATERHOUSE (Age 7).

[There are about 300 models of motor cycles on the market, but these include the several models made by each manufacturer. If our correspondent has a list of 200 different makes he cannot have missed many. We congratulate him.—Ed.]

#### Paraffin as a Fuel.

Sir,—Since August, 1915, I have run on equal parts of petrol and paraffin with my 2½ h.p. twin Enfield. No alteration was made to the carburetter, for the machine started readily and developed full power.

I average 150 miles per week, and have taken the engine down but once. Little carbon deposit was found, and the engine still runs smoothly and quietly. I am quite satisfied with the mixture. S. E. G. HILL.

Sir,—I have for the last two months been using a mixture of this myself. I have tried several different mixtures, but have found that without altering the carburetter I obtained the best results from half a gallon of petrol (No. 2) and half a gallon of paraffin. I am very satisfied with the result. So far I have had no trouble in starting or running slowly or knocking, and on a long run I have procured 112 m.p.g. on the above mixture. My machine is a 1913 2½ h.p. Douglas two-speed gear. J. LEY.

Sir,—Having read in *The Motor Cycle* the interesting experiences of D. R. Edwardes-Ker, "Paraffin as a Fuel," I take the liberty of making a few remarks myself, as I am the patentee of a device, "To facilitate the use of paraffin," which was illustrated in *The Motor Cycle* on February 18th, 1915.

Your correspondent says paraffin can be used in an ordinary petrol carburetter. Quite true. He then says when paraffin alone is used considerable knocking is obtained on the slightest provocation on hills with overheating.

Now, the reason I write is to explain the cause and remedy of knocking. Knocking is caused by too much compression. Assuming now we have a motor cycle with a clean cylinder which does not knock or overheat. We run this engine on petrol, and the combustion head becomes carbonised. This deposit gradually accumulates and increases the compression ratio until the engine will knock, overheat, and suffer from pre-ignition. We then decarbonise, and the engine runs without knocking once again. Now, assuming that instead of decarbonising the cylinder, to stop the knocking by reducing the compression ratio, we reduce the compression by fitting an auxiliary compression chamber which can be screwed into the cylinder in the place of a valve cap, the engine will then run without knocking or overheating.

Referring to paraffin again, should an engine knock when using paraffin, it is necessary to reduce the compression sufficiently by screwing an auxiliary compression chamber into the cylinder in place of a valve cap; then the engine can be run on pure paraffin, and will run as well on this cheaper fuel as on the expensive petrol. It must be understood that different fuels require different compression ratios.

The use of paraffin does not deteriorate any part of the engine, and considerable economy is effected. I have thoroughly tested paraffin as a fuel, and must say that very little difference in the running is noticeable. Of course, my machine is fitted with my patent improved fuel feed system. I have no doubt that paraffin will be the fuel employed in the future, and when a paraffin driven motor cycle comes on the market, as it will eventually, there will be a big demand for it. E.S.

Sir,—I feel I cannot allow your correspondent's letter re paraffin as a fuel to pass unheeded. I refer to that of Mr. T. H. Ward in a recent issue. Paraffin will give more power, increased flexibility, and will not overheat or ruin valves and bearings if treated in a manner it deserves. To run paraffin through an ordinary carburetter is asking for trouble; but with a properly designed instrument, such as was fitted by a friend and myself to a 3½ h.p. Triumph over three years ago, I can guarantee any of the advantages mentioned above.

As is well known, paraffin induced through an ordinary carburetter is induced in the form of small particles and not as a vapour. As I can prove from experience, the paraffin in this form will leak from valve caps and will wash away the oil from the cylinder walls. Obviously this shows incorrect carburation, and is detrimental to the well-being of the engine. With the carburetter we fitted, it was possible to start up with a liberal injection of petrol, and it would give more power on hills, more miles to the gallon, and more speed without overheating or knocking. It was possible to get well over 150 m.p.g. with close on 60 m.p.h. I think this will show that with paraffin, if correctly treated, one can get much better results than with petrol. The only disadvantage was the "creeping" of the paraffin all over the machine. As for the difference in price of petrol and paraffin, I fancy that can be left to your readers.

I might mention that carbon deposit was light and soft in nature. The absence of knocking was due to two causes: Firstly, the softer impulse on the explosion stroke owing to the paraffin being slower in burning than petrol; and secondly, that there was no unvaporised fuel to wash away the oil from the cylinder walls.

I hope you can find room for this in your valuable paper. I think it is quite time paraffin was treated with a little more respect and not contempt. FE 535.

#### Stars and Stripes.

Sir,—Can I sit in on a few of the Ford stories you are listening to? Thanks!

There was talk that Ford was going to paint his cars yellow in 1916 and sell them in bunches the same as bananas, but nothing came of it.

That will be enough, seeing that you are receiving so many from other readers.

We have had an unusually hard winter this season, just one snowstorm after another.

Have ridden three American lightweights to date, and think the Indian featherweight to be the best of the lot. That one has three speeds, a clutch and a kick starter, and, much more important, a get-away that is astonishing for a two-stroker. By golly! if the local agent does not look out I shall be wearing out his demonstrator for him.

Just for a trial the other day, O'Brien, of the Hendee Manufacturing Co., took me on the luggage carrier, and went out in a snowstorm. We bucked four inches of the beautiful white stuff for six miles, and the engine just purred along all the time, and we weighed 340 lb. at that.

There was a time when I thought the carburettor controls on the handle-bars were unsightly; possibly I do still, but that is forgotten in my enthusiasm over the Amac and B. and B. carburetters.

Some day, and it is not far distant, our riders are going to fall hard for the twin two-stroke, for that, to my mind, would be ideal; just like a Henderson four-cylinder without the weight or cost.

Well, I have to save some stuff for another letter, hence the period goes right here.

ELLIOTT B. HOLTON,

Secretary, New Jersey Motor Cycle Club.

Newark, N.J., U.S.A.

### Baby Two-strokes up Freak Hills.

Sir,—As two-stroke experiences are of general interest now, and in response to the request for these, I have taken my Triumph Junior up Sutton-Bank, Kirkstone Pass, Garrowby Hill, Greenhow Bank, Dunmail Raise, Blue Bank, and Saltersgate Hill (Devil's Elbow), etc., in the course of a good bit of touring. I bought it to hack about up to golf, etc., and did not realise its possibilities. For touring it is not fast, but will average 20, besides being very comfortable, with an even torque, and it does not mind grease or bad surface. Tyres and belts seem to last indefinitely, but the consumption for a 2½ h.p. is high (about 70 m.p.g.), and so is the oil. The petrol system is dirty, and the carburettor has often to come down; in fact, this is a real drawback, but I hear there is an improvement on the way. The engine soon loses power unless kept clean, and I take it down about each 500 miles, but this is a simple job. The machine is a real bit of Triumph work in construction, and in this respect succeeds where many similar machines fail, as the latter are not strong enough for the engine. I have driven different motor bicycles and cars since 1907 and have some experience, and my conclusions are that, within its limitations, the Triumph Junior is a lovable jigger, suitable for lady or an ancient like myself. MALCOLM O. JONES.

### Diesel Engines for Motor Cycles.

Sir,—I would like very briefly to comment on two letters from correspondents in *The Motor Cycle*.

I am particularly interested in the letter from Capt. M. Vacy-Ash, and I fully agree with him that the time is bound to come when an engine will not have the varying mixtures thrown at it anyhow, but will be fed with the proper amount for both conditions of stroke and speed.

Unfortunately, if the petrol is diluted with heavy fuels of the paraffin family, sufficient to obtain economy, the small valves are very liable to stick; but I think this is a point which could be overcome particularly by means of water injection or the use of lower compression engines or alcohol.

The letter from Mr. A. B. K. Watkins is, if I may say so, also very interesting, particularly to me, as I have conducted many experiments with the use of petrol vapour and water for turbine purposes. To use water in the cylinder in large quantities, except for cooling by direct injection, and particularly if the cylinder is lagged, might not only mean that the temperature would be rather high, unless a separate plate were used, such as for solid fuels, etc., but if the walls were kept hot enough efficiently to prepare the steam it might mean that they would be too hot for effective running on mixture, and too hot to lubricate effectively.

The dangerous deposit obtained with paraffin is very common unless the compression is lowered. It is simply a tarry carbon which collects in the rings and piston, etc.

It is dangerous because of its extraordinarily scaley and hard nature, which is very liable to cause sticking and scoring of the cylinder.

A. M. LOW, A.C.G.I., D.Sc., etc.

### Carbonisation.

Sir,—The following experiences, based on seventeen years' riding, may be of interest as being diametrically opposed to those of Mr. Olsson, whose figures strike me as hardly credible.

Since 1910 I have owned and driven the following machines, all of the single-gear fixed engine type. Most were used at least 5,000 miles, each was driven at fairly easy speeds, and all were kept in tip-top order. All gave the greatest possible satisfaction. Careful records were

kept of each run and adjustment, made. All the well-known carburetters were fitted, but no difference was discernible in this respect (except possibly in favour of the variable jet type). All were new machines, and most had picked engines.

The machines were two T.T. Triumphs, one 8 h.p. 85×85 twin Matchless-Jap, one T.T. Bradbury, one T.T. Rover, one 90×77½ single J.A.P., and two T.T. Jameses (86×96 and 86×103). The last-mentioned machine was made to my special order, and is not standard. All were run with fairly high gears—4 to 4½ in the case of the singles and 3½ to 3½ to 1 in the case of the "twicer." Huile de Luxe used in all.

In the case of the singles it has invariably been found that poor running and "konking" started after, about five hundred miles since the last decarbonising, and in *not one* instance was it found possible to put off the evil day beyond seven hundred miles. In fact, had I been a competition rider the cleaning would have been effected every three hundred to four hundred. The twin would run eight hundred to nine hundred miles without deteriorating, but was unquestionably under-oiled.

None of the machines were over-oiled, and one pumpful every sixteen miles has been found ample with the 3½'s at touring speeds.

"Blinding" has not been indulged in, and the driving has, I think, been reasonably skilful all through, which makes the matter all the more mysterious. On the other hand, a large part of the mileage is covered by London traffic, and my personal view is that the carbonising is due to running on nearly shut throttle at slow speeds with big engines. Further, the gears being high would demand a very high level of tune in the engine.

Accordingly I should be most interested to hear other riders' experiences, as I regard this point of vital importance to keen riders. In fact, so important is it that my choice of a machine depends to a large degree upon the ease or otherwise of detaching the cylinders. Hence twins have been avoided, as usually being heavy sinners in this respect; makers are extremely remiss in this connection.

I should like to know of the oil that costs 7s. 6d. per gallon.

AUTOBORE.

### 45,393 Miles in Three Years on a Triumph.

Sir,—Motor cyclists seldom retain their machines for more than one or two seasons. The following extracts from my records may therefore be of interest to your readers.

The machine, originally a three-speed 1913 Triumph, has been on the road practically every day for three years, though recently, owing to my having the use of a Government car, the weekly mileage run has been very much reduced.

The early pattern three-speed gear fitted to the machine has now been scrapped, a Triumph free engine being substituted. A free-engined Triumph is, in my opinion, an ideal solo mount.

The expenditure on tyres has been heavy. For two and a half years I stuck to one make of rubber-studded tyres. Originally I got well over 4,000 miles from a back tyre and at least 6,000 miles from a front, but this mileage steadily went down until my last three back tyres all gave way at the bead in less than 2,000 miles.

On August 1st last I fitted a pair of Dunlops, and am still running the same pair. They are splendid non-skids and have run all through the winter without giving me any trouble.

The machine commences its fourth season in excellent order, and it is a curious fact that with old age it becomes more and more reliable.

Expenses come out as follow:

Licences, etc. ... ..	£3 10 0
Refits, etc. ... ..	38 16 1
Fuel ... ..	35 0 6
Oil ... ..	4 7 4
Tyres ... ..	31 4 3
Belts ... ..	7 5 3
Carbide ... ..	13 6
Depreciation ... ..	40 0 0

£161 7 11

.85d. per mile.

C. W. TOMLINSON, Lt.-Com. R.N.

### Top Feed Carburetters.

Sir,—Under the heading of "Occasional Comments" in your issue of March 9th I found a paragraph which I read with much interest.

My machine, a 4 h.p. chain-driven B.S.A., is fitted with a "top-feed" carburetter, and has rendered continuous service throughout the war without the very slightest trouble.

In the first place, vibration flooding is a thing I am never troubled with. The filter keeps remarkably clean, the dirt simply being pushed aside on the lower end of the gauze by the flow of petrol. As for air locks, I have never had one, and I consider, without any hesitation whatever, that a properly designed "top-feed" carburetter is far more efficient than any other.

Furthermore, it never freezes. In the coldest of weather the carburetter answers as sweetly as on a mild summer's day. The machine will run continuously at walking pace, or roar up any hill on top gear at a good 40 m.p.h. At an average speed of 45 m.p.h. my petrol consumption is about 75 m.p.g.

"Top-feed" carburetters have no competition successes to their credit. Perhaps so; I cannot think of any, but time will show that for reliable efficiency at all speeds, in all weathers, and under the most severe conditions, the "top-feed" will prove itself superior to any carburetter on the market.

"TOP-FEED" SUPPORTER.

B.E.F.

### A Double-acting Two-stroke Engine.

Sir,—The following idea struck me the other day, and I should be glad to know what your readers think about it. It is the pump cylinder practice, but differs in that it is double-acting.

A and B are two cylinders cast together. B is a pump, while A is a common cylinder with both ends closed, also connected at both ends by transfer ports C D, with automatic valves opening into A. Also two sparking plugs are situated at the two extremities of A, while two exhaust ports EF are uncovered as in usual two-stroke design. Now the pistons in both A and B are closed at both ends and connected with shafts, which slide up and down in packed glands GH, outside which they are fixed to gudgeon pins. They then connect to a two-throw crankshaft, which allows B to be at the top of its stroke while A has only completed five-eighths of its travel. In B, besides C and D, there are two other ports at either extremity, which connect, through automatic valves WX, to a carburetter.

Now let us take the operations. B sinks towards H, at the same time sucking in gas through W. But between B and H there is a space filled with gas obtained from the last rise (through X); this is now pressed through D, and helps to drive out the exhaust gases through F. Just as B has started back, A reaches G, and is driven back after compressing the gas, which is now fired. Meanwhile B has reached the top of its stroke, and the whole performance is repeated.

L.C.J.

### Don't Teach Your Parent's Parent . . .

Sir,—Your contributor who uses the pseudonym of "Ixion" certainly manages to write a readable page in each issue, and I have often wondered how he maintained the steady flow of experiences. Such unusual experiences come to few of us, but then, perhaps, your readers are merely daily users of motor cycles, and cannot be expected to know as much about their mounts as a theorist must do.

Lately, however, the occurrence of mistakes has become a little too obvious, and I take a pen up to try to give your contributor a little help. I will touch upon several points on which "Ixion" seems misinformed.

1. CARBON ACCUMULATIONS.—The impression is steadily conveyed that a single-cylinder engine must require decarbonising at or under 2,000 miles. In the past four years I have owned two single-cylinder machines. No. 1

had a bore and stroke of about 65×75, and did 6,200 miles before it was taken down, and again 4,487 miles before I sold it in fine condition. No. 2 has a bore and stroke of 86×112, and has done 4,250 miles since I bought it in May, 1915. Practically all this mileage has been done with 150 lb. coach sidecar, mostly empty, but sometimes with two up besides driver. This engine is clean to-day, and shows no loss of efficiency or knocking. The names of these machines can be given, but I refrain from saying more than that No. 1 was a foreigner (Belgian), and No. 2 a Coventry-made machine of the big single type. I have also had experience of my brother's single-cylinder machine, a later type of the same machine as No. 1 above. This machine did a year's work, about 4,000 miles, and never came down at all.

2. THE INEVITABLE SNATCH OF A CHAIN DRIVE.—I use the words only as an impression from the bletherings of "Ixion." I have in present use the No. 2 machine mentioned above. It is equipped with all chain drive, and in use is smoother than a belt-driven machine. Of course, the engine sprocket has a good shock absorbing clutch, but so has every chain-driver of repute. This machine barely takes off the ribs of a Palmer Cord cover on the back wheel in 2,000 miles of sidecar work.

3. FOUR-CYLINDER MACHINES.—Here again "Ixion" writes from the fulness of an empty mind. It does not appear that he ever owned a four or ever rode one for more than five miles. Personally, I have had two, and, though a reasonably busy man, have done all my own work on them. One did not need to take the engine out of the frame, as "Ixion" covertly suggests, nor to decarbonise more often than every 3,000 miles. Granted that the job was a bothersome one because of scraping four pistons; but any four-cylinder user will laugh at the suggestion that the bicycle takes five or six times as much keeping in order as a single. No, it was not there that the shoe pinched, but rather in the lack of power for sidecar work.

4. SHAFT DRIVE.—"Ixion" remarks that in the present state of affairs shaft drive stands or falls with the four-cylinder engine. The shaft drive has been giving absolute satisfaction for five years on what is probably as good and efficient a single-cylinder lightweight as can be found on the market, albeit temporarily under a cloud of Germanic origin. I owned one, and rode it for 10,600 miles with regularity and with the minimum of attention. The drive never cost me a penny, nor did I ever take the cardan joint, shaft, or gear box down. The drive was unquestionably smooth and satisfactory. Tyre wear was quite normal. I have had experience of three other machines of this type, in all of which the users were charmed with the absolute efficiency of the shaft drive, as well as with its neatness and perfect protection from mud and wet.

Had the war not supervened (or intervened) it is probable the F.N. Co. would have placed a twin-cylinder machine with shaft drive on the market. Had this been so they would assuredly have secured my order.

Usual disclaimer applies, and I am a private owner.

NIXION.

["Ixion" remarks that the contents of the above are so much at variance with normal experience that he does not propose to reply at length. On the question of carbonisation, he points out that not long ago a leading article in *The Autocar* stated that the water-cooled engines of motor cars normally showed the effects of carbonisation after 2,000 miles running, and that any engineer will admit that air-cooled engines carbonise more quickly than the water-cooled types. On the four-cylinder controversy, "Ixion," curiously enough, received a long letter by the same post from Mr. Osborne Blythe, L.R.I.B.A., which commences, "I most heartily endorse every word you say," and goes on to remark that, though some four-cylinder engines can be decarbonised *in situ*, the job cannot be properly done unless the engine is dropped, and that the work will then take an amateur a day and a half to perform, as against the hour in which any smart amateur can decarbonise an accessible single-cylinder. If "Nixon" had, further, been cognisant with competition work, he would know that on more than one occasion the leading experts in the Scottish Six Days actually had their engines "cy cleaned" *en route* when slack supervision permitted it.—Ed.]



# QUESTIONS & REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Voltage at Plug Points.

**Q** I shall esteem it a favour if you will tell me the voltage across the points of a standard sparking plug from any good make of magneto.—J.G.

The voltage of a high-tension spark is roughly 25,000 volts for each inch of spark obtained. The average magneto will only jump a gap of  $\frac{1}{4}$  in. at the most, so the voltage would probably be in the neighbourhood of 8,000 to 12,000 volts.

## Adjustment of Contact Points.

**Q** Why should the fact of the platinum points separating a greater distance than the usual .4 mm. cause difficult starting and poor running, provided that when the points do meet a good contact is made?—B.J.

The contact points being adjusted with a wide gap should not affect the actual starting of the engine unless the gap was really excessive, but directly the engine commences to turn at any speed the wide gap would probably cause missing or sluggish running, owing to the fact that the points take a comparatively longer time to make contact when adjusted too wide apart.

## Storage of Petrol for Private Use.

**Q** I shall be glad if you will kindly inform me the quantity of petrol it is possible to store on ordinary private premises without liability, and also if there are any special conditions regarding storage.—A.J.

A motor cyclist is entitled to store not more than sixty gallons of petrol for private use if it is kept in two-gallon sealed tins made of metal and marked "Petroleum spirit. Highly inflammable." The tins must be stored not less than 20ft. from any building, timber stack, or other inflammable goods which do not belong to the motor cyclist, and if kept in a storehouse such storehouse must be thoroughly ventilated. If the storehouse forms part of a dwelling house, or building where persons assemble, it must have a separate entrance, and must be entirely shut off from such dwelling house or building by a substantial or non-inflammable partition or floor. If a motor cyclist cannot store his petrol in such a place as prescribed above he must apply to the local authority for a licence, in respect of which a small fee will have to be paid, and the requirements of Sections 8 to 15 of the Regulations for the Storage of Petrol, issued by the Home Office on the 31st July, 1907, must be complied with.

## Overheating and Excessive Vibration.

**Q** My machine is a 1913  $3\frac{1}{2}$  h.p. single, which I purchased second-hand. I have been much troubled by excessive vibration and overheating. The machine has been twice returned to the makers, but, except that the engine does not knock and overheat quite as much, it seems no better. I have tested the balance of the flywheels in the manner recommended by the booklet published by you on the subject, and find that the piston and connecting rod are much too heavy. Could I safely remove the weight by drilling the piston and connecting rod?—M.H.

Balancing an engine is a decidedly tricky job, and requires considerable care and skill. Are you perfectly sure that the piston is too heavy, according to the booklet? Most pistons will stand a considerable amount of weight being removed by drilling holes about  $\frac{1}{16}$  in. or  $\frac{1}{8}$  in. in diameter around the skirt, and the connecting rod may usually be lightened in a similar manner. But, in doing this work yourself, you should be absolutely confident that the parts do

want lightening, and also exactly how much metal requires removing, otherwise you may make matters considerably worse, as it is easy enough to remove the metal, but if you remove too much it is not so easy a matter to replace it. Before doing anything drastic, we would recommend you to make sure that the vibration is not due to the engine being insecurely held in the frame, or to a loose gear box or other fitting. We have known a weak or loose tank cause very bad vibration.

## Current Consumed by Electric Bulb.

**Q** Will a two candle-power bulb consume as much electricity as an eight candle-power, both of the same voltage?—R.H.

The two candle-power bulb will consume less current. Provided that both bulbs are of the same pattern, they will probably give about one candle-power per watt. Thus the two candle-power bulb will take .5 ampere at four volts and the eight candle-power bulb two amperes. Some of the smaller lamps are, however, not so efficient as this, and the small bulb may take as much as one ampere.



THE LIGHTER SIDE OF LIFE AT A DESPATCH RIDERS' TRAINING CENTRE.

The signs exhibited are "Garage and Pretorium" (presumably referring to a disused fowl pen) and "Repairs and Spies neatly executed on the Premises."

**Valve Clearance.**

**?** My  $3\frac{1}{2}$  h.p. machine, which has m.o.i.v., has fallen off in power, and on examining the machine I find that, although the clearance between the exhaust valve and tappet is not great, there is about  $\frac{1}{16}$  in. between the tappet and bell crank. Is this likely to affect the power, and should it be taken up, and about what lift should the valve have?—W.J.

The loss of power is in all probability due to the exhaust valve having insufficient lift. The tappet should touch the bell crank when the valve is closed, and there should only be about .4 mm. clearance between the tappet and the valve stem. The correct lift is governed by the design of the cam, and if this is not worn there is no need to trouble about it, provided all the clearance you mention is taken up. Also make sure the silencer outlet is quite clear and not causing back pressure. Faulty or weak piston rings might also cause loss of power.

**Gravity Fed Lubrication.**

**?** I am contemplating fitting a drip feed lubricator to my  $3\frac{1}{2}$  h.p. single. I thought of feeding the oil to the engine by gravity through a sight feed regulator. Would you tell me if this would be likely to be satisfactory, and could the oil be regulated as well as with the other types, such as those fed by a pump and spring or the suction feed types?—A.H.

The oiling arrangement which you suggest should be perfectly satisfactory, and, in fact, on several old cars this method has been used with perfect success. It is necessary to arrange for a non-return valve to be fitted between the engine and the lubricator. By doing this the system would be partly by suction from the crank case, and so would be equally or more satisfactory than the system employing only the suction of the engine. In cold weather you may experience some difficulty with the oil being thick and the supply varying accordingly. Large bore pipes will overcome this difficulty to some extent.

**Flooding Carburetter.**

**?** I want to alter the petrol level on the carburetter on my machine, as I think it drips too much below the jet when I flood it. How should I do this?—

A.H.

The fact that the carburetter drips after being flooded does not show that the petrol level is too high, as by flooding the carburetter you naturally cause the petrol to overflow. Provided it does not drip when standing, there is no need to interfere with the level. If, however, it does drip when standing, it may be caused through the needle valve requiring grinding in. The level can be lowered if absolutely necessary by sliding the little collar on the needle in which the toggle arms work slightly higher up the needle; that is, if these are fitted to the top of the carburetter float chamber. Take great care not to bend or damage

Thursday, April 13th.

THE MOTOR CYCLE

**ANNUAL SPRING NUMBER**

the needle. Hold the needle between two pieces of wood in a vice with the collar resting on the top of wood, and tap the head of the needle with a hammer.

**Backfiring.**

**?** I have a 1908 Triumph which has rather a high compression, and I experience great difficulty in starting owing to it backfiring violently. I have tried starting with the ignition lever in several different positions, but without much improvement. The magneto is timed so that the points break with ignition lever fully retarded and piston on top of compression stroke.—J.W.

The backfiring you complain of is undoubtedly caused either through having the spark lever too far advanced, or trying to start with the throttle too widely open. Try timing the spark as follows: Piston on top dead centre (firing stroke), ignition two-thirds retarded, contact points just separating. This position should give you ample retard to prevent backfiring; but with this machine, owing to the rather high compression, you would probably find that the spark might take place with piston on top and spark only half advanced without interfering in any way with the running. When starting do not give more than one-third to one-quarter throttle opening, and fully close the air. For easy starting a strong mixture, and very little of it, is best.

**Accumulator Charging.**

**?** Would you kindly tell me how to charge a 40 amp. 6 volt accumulator from a 230 voltage 10 amp. main (direct current)? At present I have wired a board with the positive wire running through three 230 volts 32 c.p. lamps to accumulator positive terminal, from negative terminal, back to main, with a switch between main and lamps.—F.F.

Your arrangement for recharging your accumulator seems to be quite correct. The larger the number of lamps inserted in a circuit, the greater will be the number of amperes at which you will be charging, provided the lamps are in parallel. It is also possible to connect up to the switch controlling a cluster of lamps; in this case you connect the two wires to the two switch terminals, the accumulator then acts as the switch, and the switch itself should be placed in the off-position. By connecting up in this manner the lights may be used for lighting purposes at the same time.

**Damaged Magneto.**

**?** Can you suggest a cause for the bad behaviour of my magneto?—It is a twin, and refuses to raise a decent spark on one of the plugs, with the result that at low speeds the engine will only fire on one cylinder. I have had it overhauled by a magneto specialist, but he has only succeeded in making the feeble spark rather more feeble than it was; and I have tried the effect of exchanging the plugs and the cables, and varying the gap of the points, with no greater success. It may assist your diagnosis of the trouble to know that it only developed after a fire, which reduced the machine to an unrecognisable mass of metal.—H.E.K.

You should look to all the following points: Make sure the carbon brush and holders are in sound condition and are not shorting anywhere, and that the distributor slip ring is not cracked or damaged, and is quite free from oil or dirt. See that the contact breaker is clean and that the rocker arm is quite free and not sticking at all; the points should separate about .4 mm. A damaged carbon brush holder is a very likely cause. If all these points are right, the trouble is undoubtedly due to the fire, which has probably destroyed the insulation somewhere in the armature, in which case you should send it to some really reliable firm of magneto repairers.

**EXPERIENCES WANTED**

"H.A.B." (Coventry).—Zenith carburetter on Scott. Consumption and acceleration.

"A.C." (Notts).— $2\frac{1}{2}$  h.p. two-stroke Allon; also Connaught and Campion. Speed, consumption, ease of starting, and reliability.

**RECOMMENDED ROUTES.**

**BARROW-IN-FURNESS TO NORWICH.**—W.H.P.

Barrow-in-Furness, Ulverston, Kendal, Kirkby Lonsdale, Ingletton, Settle, Skipton, Otley, Leeds, Pontefract, Doncaster, East Retford, Newark, Sleaford, Swineshead, Long Sutton, King's Lynn, Swaffham, Dereham, Norwich.

**LLANDUDNO TO UTTOXETER.**—D.P.

Llandudno, Llanrwst, Bettws-y-Coed, Cerrig-y-Druidion, Corwen, Llangollen, Ruabon, Overton, Whitechurch, Audlem, Woore, Blackrock, Stone, Uttoxeter.

**SHREWSBURY TO SOUTHAMPTON.**—M.B.

Shrewsbury, Bridgnorth, Kidderminster, Worcester, Tewkesbury, Gloucester, Painswick, Stroud, Nailsworth, Bath, Frome, Maiden Bradley, Shaftesbury, Thickthorn, Ringwood, Lyndhurst, Totton, Southampton.

**LEICESTER TO BRADFORD.**—H.G.K.

Leicester, Six Hills Inn, East Stoke, Newark, Tuxford, Retford, Doncaster, Wakefield, Bradford.

**PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.**

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always buying their regular supply of the journal each week. copies from the same place, if possible, or by giving a definite order to a newsagent for the



### Cult of the Sidecarrier.

We are informed that the General Electrical Co., Ltd., have recently taken delivery of a number of Harley-Davidson sidecarriers.

### Indian Spare Parts.

The London house of the Hendee Manufacturing Co. inform us that they have a large stock of spare parts—in fact, they have never been in such a good position as they are now for supplying parts. In view of last week's Proclamation prohibiting imports of cars and motor cycles, this announcement will relieve the minds of many Indian riders.

### Changes of Address.

The Rotax Motor Accessories Co. will shortly be moving from their warehouse and offices in Great Eastern Street and Curtain Road, E.C., to their works at Willesden. They anticipate that the removal will be completed by Easter, and in the meantime all correspondence should be addressed to Great Eastern Street.

Owing to increase of business, Messrs. Kemps' Vulcanising Co., Ltd., tyre specialists and repairers, have found it necessary to remove to larger premises, and are now installed at Nos. 48, 50, and 52, Hardman Street, instead of at No. 19, Hardman Street, Manchester. Messrs. Kemps are sole concessionaires for the British-made Burnett motor cycle tyres.

### Catalogues Received.

"The Ruffy-Baumann School of Flying" is a well-illustrated descriptive booklet showing methods of this well-known flying school. Flying headquarters are at Hendon, and offices and works at Kendall's Mews, George Street, Portman Square, W.

The Tyler two-stroke. The Tyler Apparatus Co., Bannister Road, Kilburn Lane, N. Kilburn, N.W. A booklet listing and describing the latest pattern Tyler two-stroke lightweight motor cycles, of the two and single-speed varieties. The company's showrooms are at 11, Charing Cross Road, W.C.

The Metropolitan Machinists' Co., Ltd., 248, Bishopsgate, E.C. A voluminous catalogue comprising pictures and illustrations of the various types of Juno motor cycles, two-stroke and four-stroke, sidecars for touring and industrial purposes, and the numerous accessories dear to the heart of the motor cyclist.

"The Derwent Sidecars." The Derwent Sidecar Co., Nottingham Road, Borrowash, Derby. This, the 1916 catalogue of the firm named, has come to hand, and it is a well illustrated production showing the different types of bodies listed.

Humphries and Dawes, Ltd., York Road, Hall Green, Birmingham. A very tastefully got up catalogue, illustrated in colours, of the latest types of O.K. lightweight motor cycles for both male and female riders.

E. A. Radnall and Co., Vauxhall Works, Dartmouth Street, Birmingham. The Radco two-stroke motor cycle. An extensive catalogue giving full information concerning these well-known lightweight machines, which are manufactured in types suitable for both sexes. The end of the booklet contains some interesting information regarding the timing of the engine. Also a leaflet concerning the 2½ h.p. Radco fitted with T.D.C. two-stroke engine.

### Reviews.

"Honourable Mention." This is the latest publication by the Harley-Davidson Motor Co. It is certainly a high-class and original booklet, which contains a series of photographs on art paper of various officers and men of the British and Allied Armies who are riding Harley-Davidson motor bicycles.

Brown and Barlow, Ltd., Witton, Birmingham. "All About Two-strokes." An interesting booklet dealing with the troubles and peculiarities of two-strokes, most particularly with regard to carburation. Though the information is chiefly intended for users of the B. and B. carburetter, many most useful hints and tips, which should be useful to the users of a two-stroke fitted with any carburetter, are given.

### Institution of Automobile Engineers.

The sixth ordinary general meeting of the session of the Institution of Automobile Engineers will be held on April 12th at the Surveyors' Institution, 12, Great George Street, Westminster, S.W., at 8 p.m., when Maj. B. W. Shilson, I.M.T., A.S.C., will read a paper entitled "From Engine to Axle." This paper is intended as a connecting link between the papers recently read by Messrs. G. W. Watson and W. D. Williamson, and the three papers together cover the whole field of the engine and transmission of the petrol-driven heavy motor vehicle.

### Lamp Shades.

For the dimming of windows and similar lights the Dunlop Rubber Co. have provided a range of shades for the use of traders, and a supply will be sent free of all cost on application to Aston Cross, Birmingham.

Mr. J. Mills, trading under the title of Mills Motors, Ltd., North Finchley, has joined the R.N.A.S. His stock of new and second-hand motor cycles and accessories has been purchased by W. H. Elcō and Co., at 16, Bishopsgate Avenue, E.C.

## Average Prices OF Second-hand Machines.

WE give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted, otherwise the last average is given, if within five weeks.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S.	1915	6	3-sp. sidecar ..	£82
"	1914	6	3-sp. sidecar ..	£72
"	1913	6	3-sp. sidecar ..	£48
"	1912	6	3-sp. sidecar ..	£44
"	1915	2½	3-speed .....	£46
"	1914	2½	2-speed .....	£39
Allon	1915	2½	2-stroke .....	£30
"	1916	2½	2-stroke .....	£36
Bat	1914	5	3-sp. sidecar ..	£53
Bradbury	1914	6	3-sp. sidecar ..	£63
"	1914	4	3-sp. sidecar ..	£41
B.S.A.	1915	4½	3-sp. sidecar ..	£93
"	1914	4½	3-sp. sidecar ..	£50
"	1913	3½	2-sp. sidecar ..	£44
"	1915	4½	3-speed .....	£50
"	1913	3½	2-speed .....	£32
Calthorpe	1915	2½	2-speed .....	£26
"	1914	2	2-speed .....	£16
Clyno	1914	6	3-sp. sidecar ..	£63
"	1913	6	3-sp. sidecar ..	£51
"	1912	6	2-sp. sidecar ..	£35
Douglas	1915	2½	3-speed .....	£44
"	1915	2½	2-speed .....	£43
"	1914	2½	2-speed .....	£38
"	1914	2½	2-sp. T.T. ....	£37
"	1913	2½	2-sp. kick start	£37
"	1913	2½	2-sp. T.T. ....	£29
"	1913	2½	2-speed .....	£31
"	1915	4	3-sp. sidecar ..	£59
Enfield	1916	6	2-sp. sidecar ..	£69
"	1915	6	2-sp. sidecar ..	£76
"	1914	6	2-sp. sidecar ..	£60
"	1913	6	2-sp. sidecar ..	£52
"	1912	6	2-sp. sidecar ..	£43
"	1915	3	2-speed .....	£39
"	1914	3	2-speed .....	£33
H.-Davidson	1915	8	3-speed .....	£67
"	1915	8	3-sp. sidecar ..	£77
Henderson	1915	4-cyl. sidecar	.....	£80
Hobart	1915	2½	2-stroke .....	£26
Humber	1914	2½	3-speed .....	£25
Indian	1915	7	3-sp. sidecar ..	£73
"	1915	7	T.T. ....	£43
"	1914	7	2-sp. sidecar ..	£55
"	1914	7	2-speed .....	£43
"	1915	5	3-sp. sidecar ..	£62
"	1915	5	3-speed .....	£50
James	1915	4½	3-sp. sidecar ..	£61
"	1913	4½	3-sp. sidecar ..	£40
"	1915	3½	3-speed .....	£48
Levis	1915	Popular	.....	£23
Matchless	1914	8	3-sp. sidecar ..	£74
"	1913	8	2-sp. sidecar ..	£49
New Hudson	1915	6	3-sp. sidecar ..	£61
"	1915	2½	2-speed .....	£24
New Imperial	1915	2½	2-speed .....	£29
O.K.	1915	2½	2-speed .....	£30
P. & M.	1914	3½	2-sp. sidecar ..	£60
Premier	1914	2½	3-speed .....	£23
Quadrant	1914	4½	3-sp. sidecar ..	£46
Rex	1913	6	2-sp. sidecar ..	£38
Rover	1915	3½	3-sp. sidecar ..	£63
"	1914	3½	3-sp. sidecar ..	£47
"	1913	3½	3-sp. sidecar ..	£37
"	1914	3½	3-speed .....	£36
Rudge	1914	3½	multi sidecar ..	£38
"	1915	3½	multi T.T. ....	£38
"	1913	3½	multi .....	£28
"	1912	3½	.....	£25
Scott	1914	3½	2-sp. sidecar ..	£52
"	1913	3½	2-sp. sidecar ..	£42
Sunbeam	1914	6	3-sp. sidecar ..	£74
"	1915	3½	3-sp. sidecar ..	£69
"	1915	3½	3-speed .....	£63
Triumph	1915	2½	2-sp. 2-stroke	£35
"	1915	4	3-speed .....	£41
"	1914	4	3-sp. sidecar ..	£50
"	1914	4	3-speed .....	£38
"	1913	3½	3-sp. sidecar ..	£45
"	1913	3½	3-speed .....	£31
Williamson	1914	8	2-sp. sidecar ..	£50
Zenith	1914	6	Gradua sidecar	£52
"	1913	6	Gradua .....	£38

# THE SPECIAL LODGE

## PLUG FOR 2-Stroke.

A model expressly designed to overcome the particular causes of trouble in all two-stroke engines.

Price **4/-** each.

*Of all dealers; or post free by return, when remittance accompanies order, direct from the makers—*

THE LODGE SPARKING  
PLUG CO., LTD.,  
BIRMINGHAM AND  
RUGBY.



## "TABLETS OF ECONOMY."

# "SPOTS"

SAVE PETROL — SAVE MONEY.  
PREVENT CARBON — DECARBONISE.

1 Tablet to 2 Gallons of Petrol increases MILEAGE  
PER GALLON by

**25<sup>0</sup>/10** upward.

JUST DROP ONE IN THE CAN!

1d. saves petrol value 1/-.

SPOTS Increase mileage per gallon.  
SPOTS Increase power.  
SPOTS Increase speed (if required).  
SPOTS Make starting in cold weather easy.  
SPOTS Enable you to use extra air.  
SPOTS Prevent formation of carbon.  
SPOTS DECARBONISE.

"Pills" for your Engine—Money in your pocket.

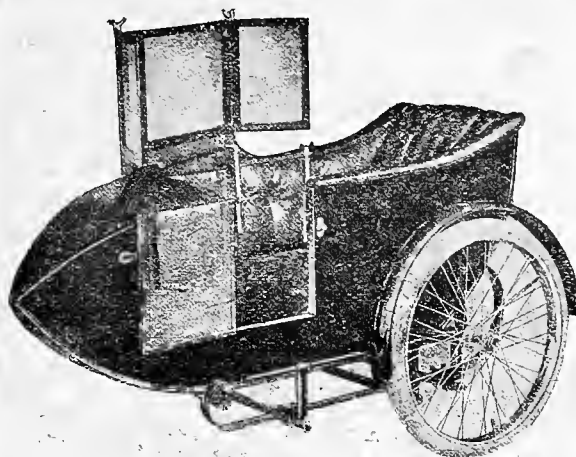
25 Tablets, 2/6	50 Tablets, 4/-	500 Tablets, 35/-
(Postage 3d. extra).	(Postage 4d. extra).	(Carriage paid).

If your Garage cannot supply you, send us P.O. as above and your dealer's name and address.

SOLE MANUFACTURERS—

**THE COAL BY-PRODUCTS COMPANY,**  
40, Holborn House, HIGH HOLBORN, LONDON, W.C.

(Five doors from Southampton Row).



## DUNHILLS PATENT TRIPLE WINDSCREEN.

**A**N ideal windscreen—keeps the passenger always snug and cosy in the coldest weather and free from draughts.

The side wings are detachable, and the screen can be tilted to any angle. It will fit any make of car.

A twist of a wing nut is sufficient to release the catch and let the screen swing across and allow the passenger to alight.

In Polished Walnut with Nickel Fittings:

Price complete with side wings	£3 0 0
Price of Single Screen	£2 2 0

**Dunhills** LTD.,  
359-361, EUSTON RD., LONDON, N.W.  
— 42-43, LOMBARD STREET, E.C. —

MANCHESTER:  
90-92, Cross Street.

GLASGOW:  
72, Vincent Street.



# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pay carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### A.B.C.

A.B.C., 3 1/2 h.p., horizontal twin, countershaft 4-speed gear, spring frame, adjustable handle-bars, fine sporting mount, new last October, appearance and mechanical condition as new. £60.—The Premier Motor Co., Aston Rd., Birmingham. [3011]

A.B.C. Motor Cycle, model A, late 1915, property of officer gone to the front, just been overhauled, enamelled, and plated, fitted with 1916 kick starter and clutch, in brand new and perfect mechanical condition; £68.—Apply, A.B.C. Motors, Ltd., Walton-on-Thames. [3125]

### Abingdon.

ABINGDON King Dick, perfectly new, 3-speed countershaft, 3 1/2 h.p., kick start, Dunlops; no reasonable offer refused, or put exchange for 2-seater car.—C. Veals, 2, Boulevard, Weston-super-Mare. [X5620]

### A.J.S.

A.J.S., 1916.—All models in stock, or for early delivery.—Moss, Wem. [X6182]

A.J.S., 1916, 6 h.p., actually in stock.—Crow Bros., 190, High St., Guildford. [2514]

A.J.S., 2 1/2 h.p., 3-speed, sporting model, in stock; £58.—Marston, 26 and 31, Bridge St., Chester. [3173]

JULIANS, Broad St., Reading. Phone: 1024.—Immediate delivery of all A.J.S. models. [X2833]

## Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone: 766.

Telegrams: "Perfection."

### NEW 1916 MODELS.

LEVIS, 2 1/2 h.p., 2-stroke ..... £32 0  
SUNBEAM, 3 1/2 h.p., 3-speed ..... £73 10  
EXCELSIOR (American), 7 h.p., 3 speeds .. £78 0  
CALTHORPE Minor, 2-seater ..... 185 gns.  
MORGAN de Luxe, and accessories ..... £117 18  
NEW IMPERIAL, 2 1/2 h.p., 2-speed ..... £36 15  
NEW IMPERIAL, 2 1/2 h.p., variable magneto £37 18  
DOUGLAS MODELS.—Orders booked now.

### (U.S.A.) EXCELSIOR,

1916, 7 h.p., 3-speed model, 84 x 89, countershaft gear chain drive, mechanical and hand lubrication, high-tension magneto, multiple-disc clutch with dual control, kick starter, 2 gallons petrol capacity; £75. Exchanges quoted. Easy Payments arranged. Sole Yorkshire distributors. Trade supplied.

### NEW 1915 MODELS.

\*CONNAUGHT, 2 1/2 h.p., 2-speed ..... £41 16  
\*WOLF-J.A.P., 2 1/2 h.p., 2-speed ..... £38 0  
\*ROYAL RUBY, 2 1/2 h.p., 2-speed, 2-stroke .. £36 10  
\*ROYAL RUBY-J.A.P., 2 1/2 h.p., 2-speed .... £39 10  
\*ROYAL RUBY, 6 h.p., 3-speed ..... £87 0  
U.S.A. EXCELSIOR, 7 h.p., dyn. lighting, etc. £71 10  
\*Cash offers wanted.

### PERFECTION SIDECARS

to suit American Excelsior and Harley-Davidson machines, 28 x 3 Dunlop tyre, grey coach-built body and chassis ..... £13 10

### SOLO MACHINES.

1915 4 1/2 h.p. 2-speed LINCOLN-ELK, as new £38 10  
1913 3 1/2 h.p. ROVER, 3-speed ..... £37 10  
1913 3 1/2 h.p. F.E. RUDGE ..... £26 10  
1913 3 1/2 h.p. ROVER, Grado gear ..... £27 10  
1912 3 1/2 h.p. 2-speed TORPEDO ..... £19 19  
1912 3 1/2 h.p. 2-speed F.E. BRADBURY ..... £27 10  
1912 3 1/2 h.p. ZENITH-GRADUA ..... £26 10  
1912 3 1/2 h.p. 2-sp. BRADBURY, chain drive ..... £29 10  
1912 3 1/2 h.p. 2-speed F.E. PREMIER ..... £27 10  
1912 2 1/2 h.p. T.T. DOUGLAS ..... £31 10  
1912 2 1/2 h.p. DOUGLAS, kick start ..... £21 10  
1912 3 1/2 h.p. 2-speed F.E. HUMBER ..... £26 10  
EXCELSIOR, 3 1/2 h.p., 3-speed, Druid forks ..... £19 19  
KERRY, 3 h.p., magneto, Saxon forks ..... £12 10  
5 1/2 h.p. Magneto REX, spring forks ..... £12 10  
N.S.U., twin, 2-speed, spring forks ..... £16 10  
TRIUMPH, 3 h.p., magneto, new tyres ..... £18 10  
NEW IMPERIAL, 2 1/2 h.p., 2 speeds ..... £25 10  
REX, 5 1/2 h.p., 2-speed, wants attention ..... £12 10  
P. & M., 3 1/2 h.p., 2-speed, chain drive ..... £27 10  
S.P.K., 3 1/2 h.p., 3-speed countershaft ..... £25 10  
REX, 1910, 5-6 h.p., 2-speed, F.E. .... £22 10  
REX, 1909, 5-6 h.p., 2-speed, F.E. .... £18 10  
HUMBER, 3 1/2 h.p., battery ignition ..... £5 10  
NEW HUDSON, 3 1/2 h.p., 3-speed, F.E. .... £22 10  
MINERVA, 2 1/2 h.p., magneto, variable gear £11 10

### SIDECAR COMBINATIONS.

Brand New 6 h.p. REX Sidette ..... £69 10  
1914 3 1/2 h.p. 3-speed ARNO and Sidecar ..... £36 10  
1914 6 h.p. REX Sidette, almost as new .. £53 10  
W.C. WILLIAMSON and Sidecar (new) .... £89 15  
1913 7-9 h.p. QUADRANT and Sidecar .... £49 10  
1912 3 1/2 h.p. 2-speed PREMIER and Sidecar £33 10  
1910 3 1/2 h.p. 2-speed REX and Sidecar .... £24 10  
3 1/2 h.p. 2-speed P. & M. and Sidecar ..... £19 19  
REX, 5 1/2 h.p., 2-speed, and Sidecar ..... £22 10

### MISCELLANEOUS.

New 8 h.p. W.C. WILLIAMSON Cy-cl-ca. £126 0  
New RITZ 4-cyl. 2-seater Light Car ..... £145 0  
MORGAN, 1914, hood, screen, lamps, speedometer, overhauled and repainted ..... £79 10  
ROVER 8 h.p. 4-seater, all on ..... £59 10  
RENO 15 h.p. 4-cylinder Touring Car ..... £65 0  
PREMIER 7-9 h.p. 2-seater Light Car ..... £67 10  
1916 12 h.p. New Type OVERLAND ..... £225 0  
New 1916 15-20 h.p. 2-seater OVERLAND ..... £265 0  
New Mechanical Horns ..... 17/6  
New Acetylene Tail Lamp, post free ..... 1/4  
At Mundersen, cost 21/-, take ..... 10/8  
P. & H. Separate Generator Lamp ..... 17/6  
Millers Late Type Lamp Set ..... £1 4

WANTED.—Second-hand Douglas, for cash.

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

A.J.S., 1913, 6 h.p., 3-speed, C.B. sidcar, lamps, speedometer, etc.—Haddfield, Chemist, Matlock. [X5125]

1912 2-speed A.J.S., in perfect condition; £25, to clear.—Horswill, 103, Brook St., Chester. [2941]

A.J.S. 6 h.p. Combination, 1916; £102/18; exchanges considered.—Campion Garage, London Rd., Derby. [2621]

1916 A.J.S. 4 h.p. Combination; immediate delivery.—Williams, A.J.S. Expert, Chapel Ash Depot, Wolverhampton. [X6117]

A.J.S., 2 1/2 h.p., 1915, expensive speedometer, lamp, etc., only ridden 300 miles; £47.—Campion Garage, London Rd., Derby. [2622]

A.J.S., 1914, 2 1/2 h.p., 3-speed, little used, guaranteed perfect; £40; exchange.—F. J. Youngs, 2 and 3, The Parade, Kilburn. [5136]

A.J.S., 1915, 2 1/2 h.p., 3-speed, lamps, horn, etc., done 400; owner foreign service; £48.—Capt. Stevenson, Hospital, Swatthling, Hants. [2957]

A.J.S. 4 h.p. Combination, with all accessories, Lucas lamps, speedometer, almost new; £80.—Marston, 26 and 31, Bridge St., Chester. [3172]

A.J.S., 1914, 2 1/2 h.p., 2 speeds, kick starter, clutch, new outers, usual accessories, nimble and fast; £38.—X., Officers' Club, Crystal Palace. [2997]

A.J.S. 4 h.p. and sidcar, 1916 model, just delivered, £93/17; also 1916 2 1/2 h.p. model, 158.—Turpin, 22 and 29, Preston Rd., Brighton. [10716]

2 1/2 h.p. 1915 A.J.S., lamp, horn, speedometer, Binks carburettor, perfect; accident sole reason; 38 gns.—Andrew, College, Holmes Chapel, Cheshire. [X6004]

A.J.S., 1914, 6 h.p., 3 speeds, speedometer, head lamp, side and rear lamps, horn, and 24 in. Gloria sidcar; £75.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X6018]

A.J.S., 1912, 6 h.p., 2-speed countershaft gear, chain drive, head lamp, horn, and rear lamp, and Gloria coachbuilt sidcar; £50.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X6017]

### Alldays.

ALLDAYS Matchless, 1915, 2-stroke, as new; £21.—Romney House, Park Hill, Carshalton, Surrey. [5139]

1915 Allon 2-stroke, 2-speed, nearly new; must sell, £33.—Clapham, King George St., Greenwich. [X6149]

ALLDAYS Allon, all models; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0763]

ALLON, 1915, £24, or exchange higher power, cash adjustment.—Phillimore, 17, Caxton Gardens, Guildford. [2995]

1915 Allon, 2 1/2 h.p., 2-stroke, countershaft drive, all accessories; £25.—Wilkins, Boot Stores, High St., Edgware. [X5913]

3 1/2 h.p. Alldays 2-speed Combination, most carefully used, and in excellent condition; £28.—1, Belgrave Mews West, Belgrave Sq., London. [X5655]

ALLON, 2 1/2 h.p., 1915 1/4, excellent condition, 2-speed, clutch, Jones trip speedometer, with tools, hooter, mirror; £38.—Melrose, 26 Aldershead Rd., Beckenham. [2965]

ALLDAYS Matchless 1915 1/4 3 1/2 h.p. 3-speed Combination, Canoelet sidcar, horn, Lucas head and rear light, not done 200, as new; cost £70, accept £50.—The Shop, Llantilio-Crossenny, Abergavenny. [X5648]

## MOTOR CYCLES FOR SALE.

## Alldays.

**ALLOD.** 2-stroke, 2-speed, clutch model, supplied new in December, 1915, very little used; 54 gns., very great bargain.—Julians, Broad St., Reading. Biggest motor cycle and light car dealers in the South. 45 years' reputation. Phone: 1024. [X4813]

**ALDAYS** Allons, all models from stock; we give special attention to the requirements of novices; deferred payments by mutual arrangement; also 1915 Allon, single speed, £27.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X3112]

## Ariel.

**1916 Ariel** 5-6 h.p. Coachbuilt Sidecar Combination, 3-speed countershaft gear, 2 Lucas lamps, horn, original tyres unpunctured, condition perfect; £70; examination invited, Birmingham.—Box 252, c/o *The Motor Cycle*. [X6116]

**ARIEL**, 3½ h.p., 1914, 3-speed countershaft, engine just overhauled new John Bull and Dunlop tyres, also Dunlop tubes, 26 in. wheels, Pedley belt and handle-grips, semi T.T. bars, Miller lamp set, rear light and horn, dark green coachbuilt torpedo sidecar, disc wheel, fine sporting outfit; 48 gns.—Worters, c/o Champion, Byfleet. [X6030]

## Auto-Wheels.

**WALL** Auto-Wheel, in good condition; £7.—H. Barker, Botesdale, Suffolk. [X5889]

**UTO-WHEEL**, good as new, Model de Luxe; £10, bargain.—J. Skaddon, Brixham. [X2958]

**UTO-WHEEL** De Luxe; £15/15, 28/3 monthly.—Seen at 248, Bishopsgate, London. [X2827]

**UTO-WHEEL**, not much used, capital condition; 27/15.—Heybours' Motors, Maidenhead. [X2936]

**NEARLY** New Wall Auto-Wheel, perfect; approval; £8.—Curd, 17, Gardner St., Brighton. [X6098]

**WALL** Auto-Wheel, in very good condition; £7/10, or near offer.—Horswill, 103, Brook St., Chester. [X2940]

**UTO-WHEEL**, never used, only shop-soiled; £11/10.—3, The Parade, Twickenham Rd., Isleworth. [X3155]

**UTO-WHEEL**, with Triumph bicycle, all as new; bargain, £12.—34, Bevington Rd., North Kensington, W. [X3124]

**UTO-WHEEL**, latest type, single lever control, little used, splendid condition; 29/10.—Murray's, 37a, Charles St., Hatton Garden, Holborn. [X6060]

**UTO-WHEELS**, three in stock, attached to lady-back tandems; 27/10, 28/10, and 29/10; write for full particulars of deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X3109]

## Bat.

**BAT-J.A.P.**, 1914, 8 h.p., 3 speeds, countershaft, combination like new; £55; exchange Douglas and cash.—Three Fishes Hotel, Kingston. [X3105]

**BAT-J.A.P.** 1916 Combination, latest model; cost over £100 month ago; must sell; accept first offer over £60.—Stone, Park Garage, Thornton Rd., Clapham Park. [X3106]

**LATE** 1915 8 h.p. Bat-Jap, spring frame, 2-speed countershaft, all chain, cane sidecar, good tyres, excellent throughout, for lightweight and cash; sell £47.—Walton, Dawson Sq., Burnley. [X5951]

## Blackburne.

**BLACKBURNE**, 1915, Sturmer-Archer countershaft 3-speed, clutch, kick starter, demonstration model, perfect, as new; £57.—May, High St., Fareham. [X5899]

**1915-16** Blackburne, Sturmer-Archer 3-speed countershaft, hand clutch, kickstart, Binks, all accessories, cost £75, and as new; 48 gns.—Troward, Heathurst, Vale of Health, Hampstead. [X3058]

## Bradbury.

**BRADBURY**, 1913, 4 h.p., Bosch, 2 speeds, countershaft; £28/10.—1, Ebner St., Wandsworth. [X6152]

**BRADBURY**, 4 h.p., 1913, 2-speed, free engine, splendid condition; £24/10.—180, Gargehill Rd., Eltham, S.E. [X2964]

**4 h.p.** Bradbury, absolute bargain, pull anything, new pistons, belt, lamps, complete; any trial; £26.—Clarke, Long Melford, Suffolk. [X3076]

**1913 3½ h.p.** Bradbury and wicker sidecar, N.S.U. 2-speed gear, perfect condition; £35, or near offer.—Apply, W. H. Johnson and Sons, King's Lynn. [X2970]

**BRADBURY**, 1912, 3½ h.p., 2-speed, head lamp, back lamp, horn, and Cowey speedometer; £50.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X6014]

**4 h.p.** Bradbury 3-speed Combination, new tyres, outfit just overhauled and renovated, mileage about 5,000, late 1913; trial run here; £38, or best offer.—70, Thorpe Rd., Norwich, Norfolk. [X6029]

## Brough.

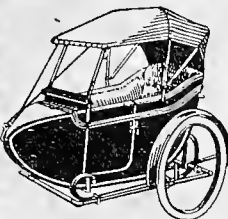
**BROUGH**, 3½ h.p., 2-speed, T.T. model; £35.—Marston, 26 and 31, Bridge St., Chester. [X3171]

## B.S.A.

**1916 B.S.A.**, countershaft 3-speed models in stock.—Lambert's, Thetford. [X2610]

## CORONET Sidecar Chassis

Is designed for long life, and has a wonderful reserve of stability, and is safe on greasy roads. Luggage carrier built into frame. Cannot shake loose, and is a boon when touring.



£10 15s.

Send for Illustrated Catalogue describing these well-known Sidecars.

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We can give immediate delivery of all models, and suitable for any make of machine.

## Coronet Sidecars for Harley-Davidsons.

We make a special Sidecar, painted to cover entire to match, 28 x 3¼, tyre, aproned fender entire body, and four-point attachment. . . . . £13 10 Immediate Delivery.

## 7-9 h.p. HARLEY-DAVIDSON.

11, electrically equipped, 3 speeds . . . . . £76 13  
11F, standard 3-speed model . . . . . £68 5  
Cash Offers Wanted.

## £81 15s. for £63 15s.

Brand new 4½ h.p. STAR Big Single, 3-speed countershaft gear, kick starter, chain drive. As turned out by makers listed at £68 5s. Complete with new £13 10s. underslung coach Sidecar. We offer the combination for £63 15s., subject to being unsold. Catalogue describing same free. Special bargain.

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7-9 h.p. HARLEY-DAVIDSON, 3-s.p., with coach Sidecar to match . . . . . £75 0  
6 h.p. A.J.S., 1915, lamps, horn, speedometer, Sidecar with screen . . . . . £73 0  
3½ h.p. LEA-FRANCIS, 1915, nearly new, 3-speed, kick starter, Hercules £13 13s. Sidecar, £5 5s. speedometer, £3 10s. lamp set; the whole cost £94 10s. . . . . £65 0  
2½ h.p. WOLF, 1916, 2-stroke, 2-speed . . . . . £33 10  
6 h.p. REX De Luxe, 1913, 2-speed model, with £16 Sidecar . . . . . £35 15  
3½ h.p. HUMBER, 1914, 3-speed model, with Sidecar . . . . . £39 15  
3½ h.p. LINCOLN-ELK, 1912 model . . . . . £15 15  
1913 HUMBERETTE Cycle Car, hood, screen, electric lamps, 3 speeds and reverse, good tyres . . . . . £55 0  
3½ h.p. RUDGE, 1912, free-engine model . . . . . £19 15  
3½ h.p. P. & M., 1909, 2-speed, chain drive with sidecar . . . . . £19 15  
3½ h.p. SINGER, 1912, 3-speed model, with cane Sidecar . . . . . £25 0  
3 h.p. HUMBER Tricar . . . . . £5 5  
1½ h.p. WOLF, 1912, magneto . . . . . £9 10  
3½ h.p. TRIUMPH, 1915, 2-speed model, with sidecar, lamps, and horn . . . . . £23 15  
3 h.p. QUADRANT, magneto, B. & B. . . . . £7 15  
6½ h.p. DE DION Light 2-seater Car . . . . . £15 15  
1915 MORGAN, 700 x 80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. . . . . £89 0  
3½ h.p. HUMBER, 1911, 2-speed . . . . . £17 15  
2½ h.p. CLYDE, M.O.V. . . . . £4 15  
3 h.p. PREMIER, 1911, B.S.A. 2-speed . . . . . £19 15  
1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn, and lamps . . . . . £89 15

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New Complete Sidecar Chassis . . . . . £ s. d.  
New Coach-built Body, side door . . . . . 2 17 6  
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New 27/4 Glare Brass Electric Tail Lamp . . . . . 4 11  
1916 Binks Carburettors. Your old carburetter taken in exchange.  
£14 Coach Sidecar, Screen, Apron . . . . . 7 15 0

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PORTLAND PLACE, SKIRCOAT ROAD,  
HALIFAX.

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## MOTOR CYCLES FOR SALE.

## B.S.A.

**B.S.A.**, 1916.—Both models in stock, or for immediate delivery.—Moss, Wem. [X6187]

**1916 4½ h.p.** 3-speed Countershaft B.S.A.; £62.—Parker and Son, St. Ives, Hunts. [X3193]

**JULIANS**, Broad St., Reading. Phone: 1024.—Immediate delivery of all B.S.A. models. [X2834]

**1916 B.S.A.** Model H, 3-speed, all chain drive, with or without sidecar, just delivered.—Plastow, Grimsby. [X6194]

**B.S.A.**, 1916 models, in stock, model H £64; B.S.A. No. 2 sidecar, £18/18.—Hanklebridge, 133, Sloane St., London, S.W. [X6093]

**B.S.A.**, 1913½, 2-speed, coachbuilt combination, all accessories, new condition; £38.—36, Mildenhall Rd., Lower Clapton. [X2912]

**B.S.A.**, 1915½, 4½ h.p., chain drive, 3-speed, clutch, kick starter, lamp, mechanical horn, little used, perfect; £55.—May, High St., Fareham. [X5900]

**B.S.A.**, 1915, 4½ h.p., chain-cum-belt, 3-speed, complete; worth £50 easily, accept £45, bargain, cash only.—Layton's Garage, Bicester, Oxon. [X6083]

**B.S.A.**, 1916, 4½ h.p., model K, chain-cum-belt, 3 speeds, kick-starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton, W. [X6072]

**B.S.A.**, 1916, 4½ h.p., countershaft, chain-cum-belt models; we can deliver from stock at £62 cash, or deferred payments.—Layton's Garage, Bicester, Oxon. [X6082]

**1913 B.S.A.**, 4½ h.p., 2-speed, chain drive, 2½ Pedley back tyre, Simplex sidecar, sound condition; any trial; £45, or separately.—A. R. Cadell, Farringdon, Berks. [X2988]

**B.S.A.**, 1914, 4 h.p., 3-speed model K, lamps, horn, and B.S.A. sidecar, with hood and screen; £57.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X6007]

**B.S.A.**, late 1913, chain drive, 2 speeds, free, kick-starter, Canelet sidecar, wind screen, luggage grid, Lucas lamps, etc., excellent outfit; £42.—5, Greyhound Rd., Tottenham, N. [X3208]

**B.S.A.**, late 1914 model, 4½ h.p., chain driven, with B.S.A. sidecar, just overhauled, and in perfect condition; trial given; what offers?—Apply, Box L1,077, c/o *The Motor Cycle*. [X3222]

**B.S.A.**, 1914 model K, 4 h.p., 3-speed countershaft, B chain-cum-belt, kick starter, nearly new tyres, horn, Miller lamp set, condition equal to new; £40.—Moxham Bros., Rodney Rd., Newport, Mon. [X5983]

**B.S.A.**, 1916 models, delivery from stock, chain drive £64, chain-cum-belt model £62; exchanges or extended payment terms arranged.—Elice and Co., B.S.A. Agents, 15-16, Bishopsgate Av., Cannonville St., E.C. [X4942]

**1915 B.S.A.** (September), model K, No. 2 sidecar, wind screen, Lucas dynamo lighting set and horn, low mileage, new spare chain, belt, valve, plug, faultless condition; cost £98, sell £79, or near offer.—Mills, 77, Dudley Rd., Tipton, Staffs. [X4611]

**B.S.A.**, 1914½, 4½ h.p., 3-speed countershaft, all chain, with B.S.A. sidecar, speedometer, 2 lamps, horn, etc.; £58; trial any time, appointment; would exchange 1914 Rudge Multi and £20; owner returning Colonial service.—Smith, 15, Gloucester Rd., Tottenham. [X6110]

**B.S.A.**, models H and K, from stock. To tradesmen who are short staffed, let us quote and demonstrate one of our commercial combinations; deferred payments by mutual arrangement. Also 2 second-hand models 1912 clutch £29, and 1913 2-speed £40.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X3111]

**B.S.A.**—New 1916 models from stock; inspection cordially invited. All-chain drive, £64, chain-cum-belt transmission £62, fitted with B.S.A. countershaft gear, free engine, and kick start; B.S.A. sidecars to fit, £16; gradual payments entertained; second-hand machines taken in exchange; generous allowance; tuition and free delivery. Buy from B.S.A. appointed agents. Phone: Holford 5777. When dealing with Wauchops, purchasers can deal with confidence.—Wauchops, 9, Shoe Lane, Fleet St., London (just off Ludgate Circus). [X6100]

## Calcott.

**1 h.p.** Calcott, good condition, tyres nearly new.—Howes, Ruyton-Eleven-Towns, Salop. [X6075]

## Calthorpe.

**CALTHORPE-J.A.P.**, 1915½, 2½ h.p., 2-speed, like new; 26 gns.—32, Comeragh Rd., West Kensington. [X3166]

**CALTHORPE**, T.T., 1915, 2-speed, 2-stroke Peco engine; £25, or nearest.—Quenby, Park House, Hitchin. [X6166]

**CALTHORPE**, new, splendid lightweight, with latest mag., 2½ h.p., 2-stroke; £28/16.—Seen at 248, Bishopsgate, London. [X2828]

**CALTHORPE**, latest 2-speed lightweight models in stock; cash or exchange; no waiting.—Eagles and Co., High St., Acton, London. [X6071]

**CALTHORPE-J.A.P.**, August, 1915, Enfield 2-speed, grips, head, fully insured; best over £25; must sell at once.—Harris, Garage, Rugby. [X3201]

**1915 Calthorpe-Jap**, 2½ h.p., Enfield 2-speed gear, practically new, complete, lamps, horn; £26.—Noble, 90, Kensington Gardens Sq., W. [X3205]

## MOTOR CYCLES FOR SALE.

## Calthorpe.

**CALTHORPE** 2½ h.p. J.A.P., with Enfield 2-speed gear, brand new, shop-soiled only; list £36/15, accept £35.—P. J. Evans, John Bright St., Birmingham. [3150]

**CALTHORPE** Motor Cycles, 1916 model. — Just arrived: 2-stroke 2-speed 31 gns. J.A.P. 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storers, 118, Gt. Portland St., W. [0777]

**CALTHORPE-J.A.P.** Sept., 1915. 2½ h.p., Enfield, variable mag., lamps, speedometer, T.T. or standard, tools: 27 gns.—Gablecroft, London Lane, Bromley, Kent. Apply Saturday or Sunday. [X5990]

**CALTHORPE-J.A.P.** 2½ h.p., 1915. Enfield 2-speed, Stewart speedometer, lamps, horn, pump, accessories, Avons, Pedley, perfect; £26/10.—Smith, c/o Y.M.C.A. Hnt, Westbere, Sturry, Kent. [3050]

**CALTHORPE-J.A.P.** 1916, latest 2-speed models in stock, 36 gns.; lady's 2-stroke, 2-speed, 34 gns.; extended terms quoted.—Elce and Co., 15-16, Bishopsgate Av., Cammille St., E.C. City Agents. 'Phone: Avenue 5548. [0479]

**CALTHORPE**—1916 new lightweights from stock, improved design, fitted with J.A.P. engine and Enfield 2-speed gear, £37/16; identically the same machine without 2-speed gear, £32; 2½ h.p. 2-stroke 2-speed model, £32/11; extended payments arranged.—Wanchope's, 9, Shoe Lane, Fleet St., London. [X6101]

## Campion.

**CAMPION-J.A.P.** 1915, 8 h.p., coachbuilt combination, 5-speed countershaft gear, speedometer, lamps, horn, etc.; £65.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X6011]

## Chater-De Dion.

**CHATER-DE DION**, 2½ h.p., clutch model, Bosch, B. and B. T.T. bars, disc wheels, sporty machine, just overhauled; £16, or offer.—Nichardy, 55, Abbotshall Rd., Cufford, S.E. [2365]

## Chater-Lea.

8 h.p. Chater-Lea and Sidecar, 1915½, 3-speeds, chain-drive; any trial given, £65.—8, Alaska St., Waterloo Rd., London. [2927]

**CHATER-LEA**, 3½ h.p., 1912, Druids, Bosch, B. and B. 3-ax engine, perfect order; £18, no offers.—Trotman, 10, Bowell Rd., Fulham. [3131]

**CHATER-LEA**, 8 h.p., 2-speed, 1¼ Whittle belt, speedometer, lamps, 2-seater cane spring wheel sidecar, screen; £42.—74, Shrewsbury Rd., Forest Gate. [2674]

**CHATER-LEA**, 8 h.p., Bosch mag., Binks carburettor, Bates tyres, Pedley belt, short frame T.T. machine, fast and powerful complete, with speedometer, and all accessories; bargain, £40.—Watson, Woodlawn, Spencer Park, S.W. [3108]

## Chater-Jap.

No. 7 Chater-Lea, 8 h.p., J.A.P., sidecar, little used, carry 3 adults 1 child; £50 cash.—35, High Rd., Willesden Green. [3049]

**CHATER-LEA**, 3½ h.p. J.A.P., with Armstrong gear, and coachbuilt sidecar, in good running order.—Seen at 248, Bishopsgate, London. [2829]

8 h.p. Chater-Jap Combination, 1913, 2-speed, clutch, speedometer, Lucas, P. and H. lamps, Canoelet, wind screen, luggage grid, perfect condition; £50.—42, Sydney St., Brighton. [2991]

## Clarendon.

**BARGAIN**—3½ h.p. Clarendon motor cycle and sidecar, B.B. carburettor, new Bosch mag., upholstered wicker sidecar; £9/18/6 the lot.—Madison Bargains, Littleover, Derby. [X5922]

## Clyno.

**CLYNO**, 1914, 6 h.p., 3 speeds, Harcourt radiator, Scott sidecar (best spring sidecar extant), 5-point suspension, exhaustively fitted, special hood pucks tight away, wind screen on hinged metal cover, grid, 2 double touring cases, 3 lamps; Cowey, X'll pan seat, 2 tyres new, spare tube, many spares and oddments; cost £110, bargain, £63.—Rev. Rademacher, Teffont, Salisbury. [2955]

## Connaught.

1916 Connaught, 2½ h.p., 2-speed 2-stroke, as new; owner ill.—Abbotsford, Walton-on-the-Hill, Epsom. [3072]

**CONNAUGHT**, 2½ h.p., standard model, lamps, horn, cyclometer; £25.—207, Westwood Rd., Goodmayes. [X5313]

**CONNAUGHT**, 1914, 3-speed, h.h.c. clutch, dip feed, new tyres, perfect condition; £28.—187, Tottenham Rd., Weybridgehampton. [X5924]

**CONNAUGHT**, miniature for immediate delivery; £28/17/6, exchange—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [2930]

**CONNAUGHTS** in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £28/7.—P. J. Evans, John Bright St., Birmingham. [3147]

## Coventry Eagle.

1916 Coventry Eagle, accessories; 26 gns.—Troward, Heathurst, Vale of Health, Hampstead. [3059]

## Diamond.

1912 Diamond, 2½ h.p., 2-speed, enclosed chains, clutch, kick-start, lamp; £19 for quick sale.—Teece, 103, Victoria Rd., Aldershot. [3037]

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## ALL 1916 MODELS.

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SUN-VILLIERS, 2½ h.p., 2-speed .....	£37 0
SUN-V.T.S., 2½ h.p., single-speed .....	£30 16
SUN-V.T.S., 2½ h.p., 2-speed .....	£38 0
NEW RYDER, 2½ h.p., 2-speed, J.A.P. ....	£33 12
ZENITH, 4-5 h.p., countershaft .....	£73 18
B.S.A., 4½ h.p., 3-speed, all-chain .....	£64 0
B.S.A., 4½ h.p., ditto, chain-cum-belt .....	£62 0
CALTHORPE, 2½ h.p., 2-speed, 2-stroke ..	£32 11
INDIAN, 5 h.p., 3 speeds, Model B .....	£70 0
INDIAN, 7 h.p., 3 speeds, Model C .....	£78 0
ENFIELD, 3 h.p., 2-speed, T.T. ....	£52 10
ENFIELD, 6 h.p., Combination .....	£89 5
LEVIS, 2 h.p., Popular model .....	£32 0
B.S.A., 4½ h.p., and No. 2 Sidecar .....	£80 18
ENFIELD, 6 h.p., electrical model .....	£105 0
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COVENTRY EAGLE, 2½ h.p., 2-speed .....	£36 15
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A number of New 1915 Machines to clear at a reduced price. Full particulars upon request.

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HENDERSON, 1915 Late, 10 h.p., 4-cyl., 2-speed model, Millford Empress Sidecar, 3 lamps and generator, very completely equipped; a bargain .....	£80
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TRIUMPH, 1912, 3½ h.p., 2-speed .....	£30
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HENDERSON, 1915, 2-speed, Millford 'Scar	£78
REX, 1914, 6 h.p., 3 speeds, accessories ..	£52
REX, 1914, 6 h.p., 2 speeds, coach-built ..	£42
ZENITH, 1915, 8 h.p., clutch, Montgomery Sidecar .....	£78
REX, 1913, 6 h.p., 2 speeds, cane Sidecar ..	£32

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P. & M., 1913, 3½ h.p., 2-speed, handle start	£35
VELOCETTE, 1915, 2½ h.p., 2-sp., 2-stroke	£32
DIAMOND, 1914, 2½ h.p., 2 speeds .....	£30
HOBERT, 1915, 2½ h.p., 2-speed .....	£27
ALLDAYS-MAHLESS, 2½ h.p., 2-speed ..	£25
NEW HUDSON, 1915, 2½ h.p., 2-stroke ..	£24
MOTO-REVE, 2 h.p., Bosch magneto, 2-cyl.	£10
N.S.U., 3½ h.p., 2 speeds, less magneto .....	£8
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BLACKBURN, 1914, 3½ h.p., 3 speeds .....	£50
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## LIGHT CARS, &amp;c.

STANDARD, 9.5 h.p., 1914, all equipment, as new, dickey .....	£175
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## MOTOR CYCLES FOR SALE.

## Douglas.

**DOUGLAS**, 2½ h.p., V, 2 or 3-speed, in stock; from £50/8.

**DOUGLAS**, 2½ h.p., U, 2 or 3-speed, in stock; from £50/8.

**DOUGLAS**, 2½ h.p., W, 3-speed, clutch in stock; £56/14.

**DOUGLAS**, 2½ h.p., X, lady's, kick-start, in stock; £56/14.

**DOUGLAS**, 2½ h.p., War Office model, in stock; £52/12.

**DOUGLAS** Agents and Specialists.—We refrain from mentioning 1916 models as at present there is no likelihood of obtaining deliveries. We can immediately supply and deliver the above latest models, brand new, at rock bottom prices.—T.A.: Bicycles. Tel.: 388.—Robinson's Garage, Green St., Cambridge. [6864]

**DOUGLAS**, 1911-12, 2½-3 h.p. twin, Bosch, beautiful order; £15/10.—1, Ebner St., Wandsworth. [X6153]

**BARGAIN**, 1915 4 h.p. Douglas, 3-speed, clutch, kick starter; £50.—Smith, 54, Connaught Rd., Cardiff. [X6185]

**DOUGLAS**, 1914, 2½ h.p., 2-speed, semi T.T. handlebars, lamps, horn, etc., fast; £34.—Vinen, Cranleigh. [X6047]

2½ h.p. Twin Douglas, mag., excellent tyres, splendid condition; bargain, £14.—Barnett, Chapel Mews, Hove. [3004]

**DOUGLAS**, T.T., late 1914, lamp, horn, speedometer, tools, fast; £38.—H. Randolph, Kitlocks, Botley, Hants. [3006]

**DOUGLAS**, 1913, 2 speeds, perfect condition, all accessories; accept £28/10.—Peacock, 274, High Rd., Balham. [3078]

1911 Douglas, 2½ h.p., splendid condition, new tyres and belt, fast, reliable; £17.—317, High St., Watford. [X6136]

1914 Douglas, 2½ h.p., 2-speed, and accessories, in good condition; seen any time; £34.—223, High Rd., Kilburn. [3132]

**DOUGLAS**, 1916, 2½ h.p., T.T., 2 speeds, fully equipped, done 200 miles, perfect; £50.—Kennure, Kenley, Surrey. [3102]

1914 Douglas, 2½ h.p., 2-speed, lamps, cyclometer, good condition; £35.—Hoare, Gowan Bank, Granville Rd., N. Finchley. [X6186]

1915 Douglas, 2 speeds, Lucas lamp set, specially tuned, guaranteed; £41, lowest.—10, Norwood Crescent, Southport. [X6089]

**DOUGLAS**, 1914, 2½ h.p., T.T. model, fast, complete, and in excellent order; £36.—Layton's Garage, Bicester, Oxon. [X6084]

2½ h.p. Douglas, perfect condition; sell 17 gns., or 24 exchange. I will give cash for higher h.p. 30, Park Av., East Ham. [X5652]

**DOUGLAS**, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas.—Moffat, Yeovil. Tel.: 50. [9203]

**DOUGLAS** 2-speed Clutch Model, engine thoroughly overhauled by makers, accessories, spares; £30.—15, Parsons Heath, Colchester. [3123]

1915 Douglas, 2-speed, U, T.T. bars, lamp set, horn, speedometer, 800 miles only; £43.—Robinson's Garage, Green St., Cambridge. [6867]

1913 2½ h.p. 2-speed Douglas, perfect condition, property of officer now leaving: what offers? trial.—12, Leweston Place, Stamford Hill. [2905]

**DOUGLAS**, 1912, 2½ h.p., new tyres, lamps, reliable, climb anything, 140 m.p.g.; nearest offer £19/10.—77a, Exton St., Waterloo Rd., S.E. [2944]

**DOUGLAS**, 1913, 2½ h.p., clutch, 2 speeds, kick start, footboards, Amac carburettor, excellent condition; £32.—K., 66, Devonshire Rd., Hatrow. [3204]

**DOUGLAS**, 1915 (November), War Office model, done 1,800, 2 lamps, Watford speedometer, mechanical horn, as new; £45.—1, Brackley St., E.C. [X6033]

**DOUGLAS**, 1911, 2-speed, back cylinder, piston, and tyres new, all accessories, good condition; £25, or offer.—South View, Cambridge Rd., Farnborough. [X5651]

**IMMEDIATE** Delivery new Douglas 3-speed, 1915 3-speed, 1914 2-speed, both as new, written guarantees willingly.—Gibb Gough, Gloucester. [1189]

**DOUGLAS**, 1914, W, clutch, kick-start, footboards, upturned handlebars, tyres excellent, engine perfect; £37/10.—Robinson's Garage, Green St., Cambridge. [6865]

**DOUGLAS**, late 1913 model, 2-speed gear, clutch, kick-start, and footboards, excellent order, just overhauled, new pistons and clutch, etc., fitted; £35.—Moss, Wern. [X6184]

2½ h.p. Douglas, full T.T., late 1913, new engine-shaft, fitted mechanical horn, Stewart, long exhaust, P. and H.; £30, after 6.—39, Wallingford Av., North Kensington. [3036]

1915 Douglas, 2½ h.p., 3-speed gear, Spartan horn, absolutely perfect condition; to be cleared at 42 gns.; exchanges easy terms.—Julians, Broad St., Reading. Biggest motor cycle and light car dealers in the South. 45 years' reputation. 'Phone: 1024. [X4812]

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HARLEY-DAVIDSON, 11F, brand new	68 5
2½ h.p. A.J.S., sporting model..	58 0
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EXCELSIOR, single-gear..	30 16
OMEGA, 2-speed, 3 h.p.	39 18
OMEGA, single-gear..	31 10
OMEGA, 2½ h.p. J.A.P., 2-speed ..	39 18
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## MOTOR CYCLES FOR SALE.

### Douglas.

**DOUGLAS, 1914, 3½ h.p.,** clutch model B, fast machine, used solo only; condition perfect, £45; seen by appointment.—Fuller, 3, Staehope Av., Church End, Finchley. [X2928]

**DOUGLAS, 2½ h.p., 1914½,** model W, kick starter, footboards, lamps, horn, tools, spare valves, condition perfect throughout; £38.—Mould, Ironmonger, Cobham, Surrey. [X5656]

**DOUGLAS, 2½ h.p., 1914,** splendid condition, new tyres and belt, inclusive lamps and tools; £38, or nearest offer; owner going to Front.—Apply, Ashdene, March, Cambridge. [X5989]

**DOUGLAS, late 1914,** model W, clutch, kick starter, new tyre, footboards fitted aluminium, 2 lamps, excellent condition throughout; £42.—Michaels, 42, Guildhall Rd., Northampton. [X5961]

**1914½ Douglas, T.T., 2 speeds,** Lucas, 3 gn. lamp set, rear light, spare belt, A.K. knee-grips, usual tools, extra bag, very good condition; £37.—Hill, 9, Britania Terrace, Saltburn, Yorkshire. [X2910]

**1913 Douglas, 2-speed, T.T.,** engine very fast and in perfect condition, enamel and plating very good; 33 gns.—Julian's, Broad St., Reading. Biggest motor cycle and light car dealers in the South. Phone: 1024. [X6188]

**DOUGLAS, late 1914, 2½ h.p.,** kick start and clutch, semi T.T. bars, also touring bars, Bosch, Amal, also all accessories, tools, Lucas lamp set and horn, and Stewart speedometer, condition as new; £47, cheap.—W. Begernie, 14, Grosvenor Rd., Westcliff-on-Sea, Essex. [X2925]

**DOUGLAS, War Office model, 2-speed,** new this year (makers' despatch ticket shown), with lamps, horn, long exhaust pipe fitted, specially tuned; £50 cash; consider good 3½ h.p. in part payment, twin preferred, or Norton, Rudge Multi, or Triumph.—Varty, Thundersley, Essex. [X3209]

**1915 4 h.p. Douglas Combination (Douglas sidecar),** 3 speeds, clutch, kick starter, head light, and 3 other lamps, speedometer, complete spares and tools, tyres nearly new, sidecar green, red upholstery, combination in excellent condition, being 6 months old, and carefully driven by engineer-owner; seen by appointment; £65; consider solo machine part.—E.G., 43, Camden Sq., N.W. [X3089]

### Enfield.

**JULIANS, Broad St., Reading,** Phone: 1024.—Immediate delivery of all Enfield models. [X2835]

**ENFIELD, 3 h.p.,** cannot take delivery; offers.—Heathcote, Beacon View, Rottingdean, Sussex. [X2683]

**ENFIELD, 3 h.p., T.T.,** lamps, and horn, in splendid order, like new; £36.—94, Gloucester Rd., S.W. [X3075]

**ENFIELD, 1915½, 6 h.p.,** coachbuilt combination, good as new; £66.—29, St. Leonard's St., Bow, E. [X3094]

**ENFIELD, 1915, 3 h.p., 2-speed,** only ridden 1,100 miles, perfect; £42.—Morriss, 139, Finchley Rd., N.W. [X2984]

**6 h.p. Enfield Combination,** complete, in perfect order, equal to new; £65.—Williams, The Crescent, Tottenham. [X2951]

**ENFIELD, 1916, 3 h.p. twin, 2-speed,** 50 gns., actually in stock; 1914 Douglas taken in part exchange.—Below.

**ENFIELD 1916 6 h.p. Combination** in stock, 85 gns.; good 1914 solo machine or combination taken in part exchange.—D. J. Shepherd and Co., Enfield Highway, N. [X2976]

**1916 Enfield Combination,** wind screen fitted, used 3 times; cost £92, sell £82.—Fox, Barracks, Lichfield. [X6140]

**ENFIELD, 1912, 2½ h.p.,** twin-cyl., Bosch mag., sound running order. £10.—Beauland, North St., Scarborough. [X6001]

**ENFIELD 1914 2½ h.p. Twin, 2 speeds,** clutch, kick starter, good condition; 30.—Lieut., 54, Pier Av., Clacton. [X3097]

**ENFIELD 6 h.p. Combination, 1913,** excellent condition; £47.—C. E. Cliffs, Draper, Elsecar, near Barnsley. [X6068]

**ENFIELD, 1915 (October), 3 h.p., 2-speed, F.E.,** kick start, 2 lamps, horn, done 500; £42.—1, Brackley St., E.C. [X6034]

**ENFIELD 2½ h.p. Twin, 1912, 2-speed,** lamps, horn, splendid tyres, overhauled; £23.—Canadian Hut, Bisleys Camp. [X5959]

**ENFIELD 1914 6 h.p. Coach Combination,** splendid condition, speedometer, lamps, and tools; £60.—28, Ulundi Rd., Greenwich, S.E. [X6111]

**ENFIELD 1916 Combination,** as new, also late 1915 ditto, £80 and £75; all accessories; seen any time.—307, Sydenham Rd., Sydenham. [X3099]

**1913 6 h.p. Enfield and Sidecar,** new Palmer and Hutchinsoson tyres, lamp, spurs, etc.; £42.—Taylor, 132, St. Albans Av., Chiswick, W. [X3162]

**ENFIELD 1916 Combination,** Lucas lamps, generator, and horn, as new; cost £95, accept £75 cash.—Bruce Wood, Horn Park, Lee, S.E. [X3207]

**ENFIELD 6 h.p. Coachbuilt Combination,** late 1913, Lucas accessories, interchangeable acetylene and electric lighting, speedometer, very economical and flexible, thoroughly overhauled, excellent tyres, spurs; £55.—Paymaster, H.M.S. Thames, Sheerness. [X2950]

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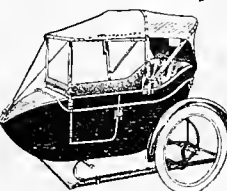
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1916 6 h.p. NEW HUDSON .....	72 gns.
1916 6 h.p. NEW HUDSON Combination ..	88 gns.
1916 2½ h.p. NEW HUDSON, 2-sp., 2-stroke	£38 0
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**WANTED,** good Machines, Combinations, or Light Cars. Cash waiting.

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## Enfield.

6hp. Enfield Combination, 1912, lamps, horn, speedometer, splendid running order; bargain, £38.—Bantley, 29, Brigstock Rd., Thornton Heath, Surrey. [X5923]

1915 Enfield 6hp. Combination, new June, Lucas dynamo set, speedometer, just overhauled by makers; £79/10.—66, High St., Stoke Newington, N. [X6135]

ENFIELD, 1914, 6hp., 2-speed, coachbuilt sidecar, lamps, etc., splendid order; bargain, £52/10, or consider part exchange.—224, Belgrave Gate, Leicester. [X6142]

ENFIELD, 3hp., T.T. model (1914), 2-speed gear, lately overhauled by makers, excellent condition, 130 m.p.g., Roman rims; £35.—Box 255, c/o The Motor Cycle. [X6197]

ROYAL Enfield Twin Lightweight, 2½hp., 2-speed gear, T.T. bars, stand, carrier, lamp, horn, splendid condition; £25.—Murray, 37a, Charles St., Hutton Garden, Holborn. [X6056]

ROYAL Enfield 1914 6hp. Combination, coachbuilt, speedometer, lamps, horn, etc.; £60.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. Phone: East Ham 490. [X6025]

ROYAL Enfield, 3hp., 2 speeds, September, 1914, hardly used, speedometer, accessories, etc.; £36/10, or close offer.—130, Hither Green Lane, Lewisham. Tel.: Lee Green 441. [X6055]

3hp. Royal Enfield (Aug., 1915), and Ralli coachbuilt sidecar (painted to match), Stewart, F.R.S. lamp, rear lamp, generator, horn, mirror, watch; £56.—Dr. Peggcock, Leyburn, Yorks. [X5993]

ENFIELDS actually in stock for immediate delivery: 6hp. combinations, 3hp. and 2½hp. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [X5143]

ENFIELD, the All-British Combination.—We have them in stock; £89/5 is the price, and it's the best thing at that or any other figure; exchanges quoted.—Layton's Garage, Bicester, Oxon. [X6080]

1912 Royal Enfield 6hp. Coachbuilt Combination, new sidecar body, new 3in. Pedley back tyre, Jones speedometer, Lucas lamps, very good order; £40.—The Premier Motor Co., Aston Rd., Birmingham. [X6015]

ENFIELDS, all models delivered from stock. To tradesmen who are short staffed, let us quote and demonstrate one of our commercial combinations; deferred payments by mutual arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X6140]

ROYAL Enfield New Combination, 6hp. and 8hp., chain driven machines, fitted with handsome coachbuilt sidecar, countershaft gear and free engine up-to-date turnout, complete with storm apron; 85 gns.; tuition free, and free delivery to any address within 50 miles of London; best terms for cash, exchange, or extended payments.—Wauchope's, 9, Shoe Lane, London. [X6102]

## Elswick.

ELSWICK-PRECISION, 1914, 2½hp., Bosch, Druids, splendid lightweight, excellent condition; £20.—C. E. Roberts, 18, Wolverhampton St., Dudley. [X6126]

## Excelsior.

AMERICAN Excelsior, 1914, 7-9hp., Gloria sidecar, speedometer, lamps, spares, good tyres.—Motorist, 146, Cloudeley Rd., Islington. [X6005]

## F.N.

5hp. 1911 F.N., Binks; 15 gns.—E. Stenbridge, Breachwood Green, Luton, Beds. [X6113]

F.N., 5hp., 2 speeds, free, splendid condition; £22; exchange.—44, Newburgh Rd., Acton, W. [X6130]

1914 F.N., 4-cyl., 2-speed, kick starter, coachbuilt sidecar, bargain, £45.—The South Essex Motor Co., High Rd., Ilford. [X6274]

F.N., 2½hp., shaft drive, countershaft 2 speeds, clutch, beautiful machine; £14/10, offers.—Speechley, 45, Church Rd., Acton. [X6215]

F.N., 2½hp., mag., B. and B., spring forks, good tyres, fine running order, only wants seeing; £10/10.—Gallant, 11, Brunswick Av., New Southgate. [X6045]

F.N., 1912, 5-6hp., 4-cyl., Bosch, B. and B., new heavy Dunlop back, fair front, overhauled, first-class order; £17.—Causar, 20, Byram Buildings, Huddersfield. [X5991]

1914 F.N., 5-6hp., 4-cyl., 2-speed, scarcely soiled; any fair trial given; with horn, lamp, tools, spare parts, and cover and tube.—Apply, M. J. Ryan, Corner House, Lanesboro', Longford. [X5894]

5hp. F.N., 4-cyl., Bosch, B. and B., central induction, handle-bar controlled, just been overhauled, splendid condition throughout; £16; exchange offers.—J. Harold, Pendennis, Russell Rise, Luton. [X6127]

## Grandex.

GRANDEX, 1912, 2½hp. J.A.P. lightweight, variable pulley, just overhauled, excellent tyres, Bosch, B. and B., not run 18 months; £14.—Causar, 20, Byram Buildings, Huddersfield. [X5992]

## Harley-Davidson.

HARLEY-DAVIDSON Models in stock, complete with Gloria sidecar.—Turpin, 22 and 28, Preston Rd., Brighton. [X6712]

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Model 11F 7-9 h.p. 3-speed; chain drive; kick starter; automatic lubrication; 28 x 3in. Goodyear tyres; tool kit, repair outfit, etc. £68

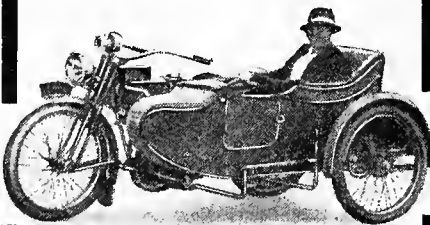
Model 11J As Model F, but complete with Dynamo Electric Lighting Outfit, head lamp, tail lamp, and electric horn . . . . £75

—and if you require a Sidecar, we show you a further saving of £2 to £3.

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Model J HARLEY-DAVIDSON, and special H.D.  
“GLORIA” Sidecar, with patent spring wheel.

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## Harley-Davidson.

BRAND New Harley-Davidsons.—See below.

MODEL F, 7-9hp., 3-speed; £68.—The Premier Motor Co. [X5923]

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THE Above are guaranteed brand new; standard specification and standard equipment.—The Premier Motor Co., Birmingham.

YOU Save a clear £14 (fourteen pounds) by purchasing direct from the recognised H.D. experts. Sidecars, enamelled H.D. grey, etc., 14 gns. to 23 gns. Full stock spare parts.—The Premier Motor Co., Aston Rd., Birmingham. [X6013]

1916 Harley-Davidsons; all models in stock.—Parker and Son, St. Ives, Hants. [X6191]

HARLEY-DAVIDSON Combination, 11C, Comfy sidecar, new last month; £72; guaranteed; deposit.—Foster, Landrake, Cornwall. [X5925]

HARLEY-DAVIDSONS, all models in stock.—Sole agent for Doncaster, Workshop, Retford, and Sheffield, Stacey, 12, Eccleshall Rd., Sheffield. [X5645]

HARLEY-DAVIDSON, latest 1916 combination in stock, 2 brakes, kick starter, all the latest improvements; £98.—Marston, 26 and 31, Bridge St., Chester. [X6182]

HARLEY-DAVIDSON, 1915, 7-9hp., electric lighting set, Millford Empress sidecar, complete with many extras and spares, splendid condition throughout; £68.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X6052]

HARLEY-DAVIDSON 1915 Model 11J, with dynamo electric lighting outfit, used for demonstration only, not done 200 miles, and guaranteed as new, £65; or with new Gloria sidecar £85.—The Premier Motor Co., Aston Rd., Birmingham. [X6014]

1915 Harley-Davidson, delivered November, 1915, 7-9hp., 3-speed clutch model; new Palmer cord car size tyre on rear wheel, fitted with very smart almost new Mills-Fulford sidecar, upholstered in green, wind screen, dust cover, etc., unused Dunlop heavy tyre fitted; price £68.—Vincent Motor Co., Rugeley Camp, nr. Stafford. [X6028]

## Hazlewood.

HAZLEWOOD, 1913, 4-5hp. twin, countershaft 3-speed, clutch, coachbuilt sidecar, accessories, perfect condition; £37.—112, Astonville St., Southfields. [X6030]

## Henderson.

1915 Henderson, mileage 600, £14 accessories; 57 gns.—Troward, Heathurst, Vale of Health, Hampstead. [X6060]

HENDERSONS, 10hp., 4-cyl., the perfect all-weather mount, immediate delivery.—District Agent, May, High St., Fareham, Hants. [X5901]

## Hobart.

HOBART, single-speed, £31/10; Hobart, 2-speed, £36/10, in stock.—Marston, 26 and 31, Bridge St., Chester. [X6178]

1912 Hobart, 2½hp., 3-speed Armstrong hub, new Dunlop tyres and belt, overhauled, enamelled, perfect condition.—Prime, Henstead, Wrentham, Suffolk. [X6086]

HOBART 1911 Lightweight, 3 speeds, T.T. bars, open frame, accessories, perfect; great bargain, £13/10, or offer; ideal beginner's machine.—136, Dalmainy Rd., E. Croydon. [X6120]

HOBART, 1916 models in stock; 2½hp. 2-speed 2-stroke, 36 gns.; your present machine can be taken as part payment.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X6480]

## Humber.

HUMBER, 3½hp., good running order; £7.—3, The Parade, Twickenham Rd., Isleworth. [X6156]

1912 Humber, 3½hp., Bosch mag., excellent condition, good tyres; £15.—167, Uppingham Rd., Leicester. [X5890]

HUMBER, 2hp., 1913, 3-speed, lamps, horn, accessories, good condition; £20.—Cutting, Post Office, Ockham, Surrey. [X5995]

HUMBER, 3½hp., with Roo gear, thoroughly overhauled, lamp, generator, horn, large toolbag, tools; £25.—Seen at 248, Bishopsgate, London. [X6830]

HUMBER, 3½hp., late 1911, N.S.U. gear, light coach sidecar, splendid condition, reliable, new spares; £24.—Simons, Stafford House, Ashburton. [X6046]

HUMBER, 3½hp., 1914-15 model, 3-speed, clutch, C. sidecar, new condition; lightweight or lady, gent's cycles part.—10, Sydney Villas, Blyth Rd., Hayes, Middlesex. [X6129]

1913-14 3½hp. Humber and Torpedo S.C., just overhauled, 2-speed, handle starting; £22, or offer; exchange.—Glass, Garage, Upper Grove House, Rotherham Lane, S.W. [X6035]

HUMBER, 1911, 3½hp., 2-speed, recently completely overhauled, nearly new Palmer cord tyres, Montgomery torpedo cane sidecar, a good reliable combination; £20.—The Premier Motor Co., Aston Rd., Birmingham. [X6012]

## MOTOR CYCLES FOR SALE.

## Humber.

**HUMBER**, 1914, 3½ h.p., 3-speed, and Canoelet sidecar, head lamp, rear lamp and horn; £45.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X6026]

**1914 2½ h.p. Twin Humber**, Armstrong 3-speed gear, lamp, horn, spare cover and tools, tin splendid condition; £25.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [26220]

## Indian.

**INDIAN**, 1910, 5-6 h.p., good condition; £18/10.—Morris, 139, Finchley Rd., N.W. [29886]

**JULIANS**, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all Indian models. [X2836]

**INDIAN**, 5-6 h.p., and attachments, new, owners prevented riding.—Silcock, 67, Westgate, Mansfield. [2929]

**INDIAN 7-9 h.p. Combination**, complete, nearly new condition; £60.—Aarston, 26 and 31, Bridge St., Chester. [3168]

**INDIAN**, 1915½, 3½ h.p. twin, 3-speed; cost £63, sacrifice £48; splendid condition.—Brooke, Joiner, Queen's Mill Rd., Huddersfield. [X5910]

**INDIAN**, 1915, 5 h.p., 3 speeds, De Luxe sidecar; £63.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X6015]

**INDIAN**, 5 h.p., 3-speed and clutch, semi-T.T. handlebars, very little used, in first-class condition; £52.—Seen at 248, Bishopsgate, London. [2831]

**INDIAN**, 1911, 5 h.p., red, clutch model, with coachbuilt sidecar, excellent condition; £32.—P. J. Evans, John Bright St., Birmingham. [3142]

**1911 Indian** (blue), 5 h.p. twin, overhauled, repainted, with Gloria cane sidecar, complete, with lamp, horn, etc.; £30.—Willways, Ltd., Bristol. [X6130]

**INDIAN**, 1911, 5 h.p. (blue), clutch model, C.B. sidecar, English controls, in perfect condition; £28, or near offer.—340, Albany Rd., Camberwell. [2948]

**1915 5-6 h.p. Indian**, 3-speed, clutch, perfect order; £50, or exchange for 7-9 h.p. Indian, 1915.—Baigent, 36, Richmond Park Rd., Kingston. [29220]

**INDIAN**, 7-9 h.p., late 1913, 2-speed, speedometer, coachbuilt sidecar, splendid condition; £35, bargain; owner bought car.—22, Somers Rd., Walthamstow. [3098]

**1915 Indian**, 5 h.p., 3-speed, clutch, kick starter, semi-T.T. bars, original tyres, lamp, Mec horn, tools, ridden about 300 miles; £45.—O/o French, Elizabeth Mews, Belsize Park, N.W. 'Phone: Ham 4855. [2947]

**INDIAN**, late 1912, blue, 7-9 h.p., 2 speeds, kick starter, heavy Dunlop driving, unpunctured, fast, flexible, Lucas lamps and horn; £30, or exchange for make not exceeding 4 h.p.—Lieut. Coombs, 6th Essex Regt., Hulton, Tring. [3092]

**INDIAN C. 7-9 h.p.**, 1915½, 3-speed combination, extension with screen, hood, luggage carrier, electrically equipped, 6 volt, done only 500, everything as new; cost over £100 seven months ago, sacrifice £75, no offers; seen by appointment, or after 6 p.m.—9, Grafton Rd., Acton, W. [2963]

**INDIANS**, most models from stock. To tradesmen who are short staffed, let us quote and demonstrate one of the commercial combinations; deferred payments by mutual arrangement. Also 7-9 h.p. spring frame solo model £51.—Lamb's 151, High St., Walthamstow, and 50, High Rd., Wood Green. [3113]

**INDIANS in Stock**—Latest models, Power Plus combinations, sporting Power Plus 3 speeds models, standard 7 h.p. overhead inlet combinations, with lighting set, the famous 5 h.p. 3-speed double-purpose mount and 7-9 h.p. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [3146]

**LOOK Here**—Must be sold, very late 1914 7 h.p. Indian and Mills-Fulford cane sidecar, guaranteed in absolutely perfect condition throughout, electric equipment, minus one battery, otherwise complete, £45/10; also latest Power Plus model F, dynamo, mag., with Indian sidecar, cost £112, done 400 miles, this is a dream to ride, like a Rolls-Royce car, for £95.—Horswill, 103, Brook St., Chester. 'Phone: 943. Chester agent and repairer for the Indian. [2939]

## Ivy.

**IVY** 1915 2-stroke, complete, used very little, as new, and guaranteed perfect; £25.—Layton's Garage, Bicester, Oxon. [X6079]

**IVY-PRECISION**, 1912-13, 4½ h.p., coachbuilt combination, 2 speeds, free engine, handle starting, Bosch watertight, smart turnout; any trial run here; sacrifice, £25, offers.—Speechley, 45, Church Rd., Acton. [3214]

## James.

**4½ h.p. James**, 3-speed; £24 gns.—Troward, Heathurst, Vale of Health, Hampstead. [3057]

**1915 4½ h.p. 3-speed James Combination**; £56; as new.—77, York Rd., S. Farnborough. [3224]

**JAMES**, 4½ h.p., 3 speeds, kick-starter, brand new, shop-soiled only, list £66/5, accept 60 gns.—P. J. Evans, John Bright St., Birmingham. [3149]

**THE King of Sidecar Combinations**, late 1914½ James, £15/15 Canoelet, 3 speeds, countershaft gear, enclosed chain drive, 2 lamps, 2 generators, horn, tools, spare cover and tub, cost £90; any trial up any hill in Derbyshire 3 up; accept £46.—H. Miles, Chesterfield. [X6120]

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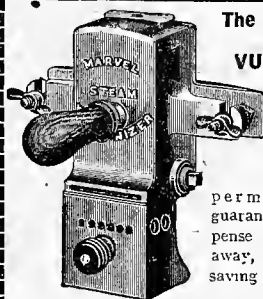
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## MOTOR CYCLES FOR SALE.

## James.

**JAMES**, 1914, 4½ h.p., countershaft 3-speed, and James Canoelet sidecar, all accessories; £45.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X6027]

**JAMES**, 1916, 3½ h.p. twin, 3 speeds, kick-starter, handle-bar controlled clutch; delivery from stock; £66/5; exchanges or extended terms arranged.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C.1. [0481]

## J.E.S.

**J.E.S.**, 1¼ h.p., new machine; £20.—Wauchope's, 9, Shoe Lane, London. [X61064]

## Juno.

**JUNO**, 1914 Villiers, 2½ h.p., 2-stroke, full equipment, splendid condition.—Atherton, 39, Kemble St., Prescott. [X6065]

**JUNO**, 4 h.p. J.A.P., 3-speed, enclosed chain drive to belt pulley, footboards, drip feed lubrication, 2½ h.p. Dunlops; £62/15, 83/4 monthly; catalogue with full particulars post free.—See below.

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## Lea-Francis.

**1915 Lea-Francis Combination**, almost as new, ridden only 600 miles; must sell; 55 gns.—Jones, 15, Portland St., Cheltenham. [X6127]

## Levis.

**1916 Levis** 2-stroke in stock.—Lambert's, Thetford. [2611]

**LEVIS**, 1916.—Both models in stock; no waiting; order now.—Moss, Wem. [X6179]

**1915 Levis Popular**, almost as new; £25.—Parker and Son, St. Ives, Hunts. [3192]

**LEVIS** 1916 Popular Models in stock; £32.—D. J. Shepherd and Co., Enfield Highway. [2974]

**JULIANS**, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all Levis models. [X2837]

**LEVIS Popular**, or new model R; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0764]

**LEVIS Popular**, semi T.T., 6 weeks old, not run 100 miles, absolutely unscratched, and perfect; £25/10; would ride reasonable distance.—8, Ashley Park, Bristol. [X6119]

**LEVIS 2-stroke Motor Cycles**, latest 1916 models.—Sole London and district agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. 'Phone: 1432 Regent. [0711]

**LEVIS Popular**, 1916 models. We can deliver promptly at £32 cash, or by deferred payments; we have also in stock the standard Popular model at £28/1.—Oxfordshire Agents, Laytons' Garage, Bicester, Oxon. [X6085]

## Lincoln-Elk.

**LINCOLN-ELK**, 4½ h.p., 1913-14, coachbuilt combination, 2 speeds, splendid order throughout; £25.—Speechley, 45, Church Rd., Acton. [3216]

**1914 4½ h.p. 2-speed Lincoln-Elk**, coachbuilt sidecar de luxe, H. and H. lamp set, speedometer, very little used, appearance and condition as new; £37. 33s. High Rd., Chiswick. [2971]

## Martin.

**MARTIN-J.A.P.**, latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.O. Tel.; Regent 1432. [0760]

## Matchless.

**8 h.p. B2 Matchless Combination in stock**; £92/17; new.—Stacey, 12, Ecclesall Rd., Sheffield. [X5647]

**MATCHLESS**, 8, 1913, coachbuilt tandem sidecar 1914/1 £55.—Godwin, Draper, Hemel Hempstead. [X6132]

**8 h.p. T.T. Matchless Combination**, overhead valves, very fast machine, and perfect; £35.—82, Caledonian Rd., N. [3164]

**1913 Matchless**, coach sidecar, hood, side curtains, screen, electric horn, excellent condition throughout; £55.—Marsh, Merham. [2915]

**1914 Matchless Combination**, luxuriously equipped, mileage 5,000; 51 gns.—Troward, Heathurst, Vale of Health, Hampstead. [3061]

**MATCHLESS**, 1914, 4 h.p. twin, 3 speeds, and Glorin sidecar; £50.—Eastern Garage Co., 418, Romford Rd., Forest Gate, E. 'Phone: East Ham 490. [X6013]

**MATCHLESS**, 5-6 h.p., free engine, excellent condition, all accessories, Montgomery sidecar; £40.—Hayes Cottage, London Lane, Bromley, Kent. [2990]

**MATCHLESS**, 3-speed, 2-seater sidecar, hood, screen, Lucas lighting set, Covey trip; £95; exchange light car, A.O. preferred.—Taylor, Grocer, Hounslow. [2917]

**MATCHLESS**, 1914, 7-9 h.p. M.A.G. engine, 3-speed, with Swan de luxe sidecar, speedometer, lamp, etc.; £72; exchange.—Youngs, 2 and 3, The Parade, Kiburn. [3125]

## MOTOR CYCLES FOR SALE.

## Matchless.

1915-7-9h.p. Matchless Combination, 3-speed, chain drive, electric lamps, new tyres, also 2 brand new spare tyres, unscratched; must sell, bargain, £60. —Warr, Grayshot, Surrey. [X6078]

MATCHLESS, 1914, 7-9h.p., 3-speed combination, just overhauled, lamps, horn, Stewart speedometer, £70.—F. N. Jones, Stottesdon, Clobury Mortimer, Salop. Seen Sanders Garage, Kidderminster. [X6129]

MATCHLESS, 1914, 7h.p., 3-speed, chain drive, and Swan sidecar, lamps and speedometer, 4,000 miles, excellent condition; cost £90, will accept £67/10, or near offer.—Motorist, 19, Melcombe Court, N.W. [X5649]

1914 (May) Matchless 8B. Combination, Lucas set, Cower speedometer, entirely overhauled, re-enameled throughout as new, not used nearly 12 months; owner active service; accept £73.—Willways, Ltd., Bristol. [X6131]

## Minerva.

MINERVA, 3½h.p., good running order; £12, lowest. —Jarvis, East Harptree, near Bristol. [X5944]

## Metro.

METRO, 2½h.p., 2-stroke, sporting model, tapered tank, only 50 miles; £28.—Heybourn's Motors, Maidenhead. [2937]

## Moto-Reve.

MOTO-REVE Twin Lightweight, Bosch enclosed mag., Amac, splendid order; best offer.—Laybourn, Wolsingham, Co. Durham. [X6133]

## Motosacoche.

1912 Motosacoche, Bosch mag., in very good condition; £9/10, or near offer.—Horswill, 103, Brook St., Chester. [2942]

MOTOSACOCHE, 2½h.p., 1911, sound condition, small mileage; 10 gns.—Widdowson and Co., Arkwright St., Nottingham. [X6061]

MOTOSACOCHE, in good condition; 8 gns., great bargain.—Julian's, Broad St., Reading. Biggest motor cycle and light car dealers in the South. Phone: 1024. [X5387]

MOTOSACOCHE, 1915, 3½h.p., mag. engine, De Lissa air-cooled valves, 2 speeds, kick starter, electric lighting set, £16 coachbuilt sidecar; great bargain, £50.—48, Hammersmith Rd., London, W. [3163]

## New Hudson.

NEW Hudson Model C in stock; £38.—Marston, 26 and 31, Bridge St., Chester. [3177]

NEW Hudson, 1915, 2-stroke, 2 speeds, lamps, etc., as new; 22 gns.—27, Weirby Crescent, Folkestone. [X6046]

NEW Hudson, 2½h.p., 2-stroke, new Aug., 1915, lamps, pump, tools, 100 m.p.g.; £20.—18, North Parade, Penzance. [3003]

NEW Hudson, 4h.p., 1913, additional Millennium gear and rim, speedometer; £21.—Reynolds, Oakland Av., Cheltenham. [X5642]

NEW Hudson, 3½h.p., 3-speed, clutch, lamps, horn, and wicker sidecar; £27; exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [2952]

1916 New Hudson Twin, Big Six, countershaft, elaborate 2-seat sidecar, just cost, £92/8, only been out twice; what offers? or exchange light car and cash adjustment.—Barnes, 85, Boundary Rd., Hove. [3107]

NEW Hudson, all models delivered from stock. To tradesmen who are short staffed, we recommend the big six with box carrier attached for quick deliveries and economical upkeep; deferred payments by mutual arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [3114]

## New Imperial.

NEW Imperial-Jap, 1916 models in stock, from £36/15.—Crow Bros., Guildford. [1878]

JULIAN'S, Broad St., Reading. Phone: 1024.—Immediate delivery of all New Imperial models. [X2838]

NEW Imperial, light tourist, immediate delivery; cash or easy terms.—Referee Cycle Co., 332, High Holborn. [10765]

NEW Imperial, 2½h.p. J.A.P., 2-speed; in stock; £36/15; exchanges quoted.—Layton's Garage, Brester, Oxon. [X6086]

NEW Imperials, latest models in stock; 2-speed, also kick-starter hand-controlled clutch models.—P. J. Evans, John Bright St., Birmingham. [3144]

NEW Imperial, 2½h.p. J.A.P., Albion countershaft 2-speed gear, late 1915 model, lamp, generator, horn; £26.—Seen at 248, Bishopsgate, London. [2833]

2½h.p. 1916 New Imperial-Jap's, 2-speed models, delivery from stock; £38; best terms for cash, easy terms, or exchange.—Wanchope's, 9, Shoe Lane, London. [X6103]

1915½ New Imperial, 2½h.p., 2-speed, semi T.T. bars, variable ignition, lamps, horn, hidden 1,500 miles; bargain, £28.—Seen J. Dry and Sons, Coachbuilders, Page St., Westminster. [X5953]

1915 New Imperial, model No. 2, with 2-speed gear, clutch, and kick-starter; to be cleared at 30 p.c.; exchanges, easy terms.—Julian's, Broad St., Reading. Biggest motor cycle and light car dealers in the South. Phone: 1024. [X5384]



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1916 CONNAUGHT Miniature	5 17 6	1 19 4
1916 2-sp. model	7 6 6	2 9 7
1916 IVY Tourist	6 0 0	2 0 2
1916 NEW IMPERIAL ...	7 10 0	2 12 1
1916 SUN-VILLIERS	6 0 0	2 0 2
1916 2-sp. model	7 10 0	2 8 9
1916 O.K. JUNIOR with J.A.P. engine, 2-sp.	7 10 0	2 12 1
1916 O.K. JUNIOR, 2-sp. with hand-operated clutch	8 0 0	2 15 11
1916 SERVICE PECO, 2½ h.p. 2-speed	7 0 0	2 7 3
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HUMBER Lightweight, 1912-13, 2 h.p.	3 10 0	15 9

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## MOTOR CYCLES FOR SALE.

## Norton.

LATE 1915 T.T. Norton, with speedometer, done 1,928 miles only, as new; £42.—Fox, Barracks, Lichfield. [X6139]

BIG 4 Norton and sidecar (Mr. Norton's famous demonstration combination), fine order; £53.—Wallis, Motors, Hereford. [3056]

1915 3½h.p. T.T. 3-speed Norton, very flexible, economical, and comfortable, in beautiful condition internally and externally; absolute bargain at £50.—Box L1,062, c/o The Motor Cycle. [2953]

NORTONS in Stock.—All models for immediate delivery, including latest T.T. model with countershaft gear, De Luxe combinations, and B.R.S., also T.T. models.—P. J. Evans, John Bright St., Birmingham. [3148]

## N.S.U.

3½h.p. N.S.U. and sidecar, 2-speed; £16, or offers.—E. Whitfield, Westwoodside, Doncaster. [X5952]

## N.U.T.

N.U.T., late 1914, 2½h.p., T.T. model, 3-speed gear, special J.A.P. overhead valve engine, little used, guaranteed; £40.—Mess, Wem. [X6180]

## O.K.

O.K. Junior, Mark IV., in stock. Get a smart little O.K. for real pleasure.—Hodgson's, Bradford. [2977]

O.K. Junior.—We have the best of the bunch, all in stock.—Rudge-Whitworth, Ltd., Sheffield. [2978]

O.K., 2½h.p., 1916 stock now in.—Call at once, Galbraiths, Rinfild St., Glasgow. [2979]

O.K. Junior.—All models for 1916 now arrived; the smartest finished lightweight made.—Ford and Brown, Liverpool. [2980]

O.K.—Buy the only machine which has stood up to the six days' trial ordeal from The Service Co., High Holborn. [2981]

O.K. Mark IV. £38, Mark V. £27/10, Mark VI. £42/10; all in stock; all 2½h.p.—T. G. Meeten, Dorking. [2982]

## P. and M.

1909 P. and M., £15; 1913, £35; both perfect bargains.—39, Belmont Park Rd., Leyton. [3184]

1913 P. and M., 2-speed, with coachbuilt sidecar, sound condition; £40, lowest.—Feeny, 2, Maunering Rd., Liverpool. [X6036]

P. and M. 3½h.p. Combination, 2-speed, 1913, perfect running condition, just overhauled; £35.—Pickett, Marine Parade, Dovercourt. [X5654]

P. and M., 1914, and 1915 sidecar, luggage grid, storm lamps, brand new tyres, horn, lamps, accessories, spares, splendid condition; 50 gns.—Langley, 48, Waterloo Rd., Bedford. [X5918]

P. and M., late 1913, 3½h.p., 2-speed, folding sidecar, lamps, horn, speedometer, 2 new tyres, done about 9,000 miles, excellent condition; £40.—Apply, Garage, Brockley Jack, Brockley Rd., London, S.E. [X6051]

1912 P. and M., 3½h.p., 2-speed, fitted with Kempshall tyres in new condition, large appropriate black P. and H. head lamp; whole machine has been very little used, and is in perfect condition, very smart; 27 gns.—Newham, 223, Hammermith Rd., W. [3118]

## Precision.

1914 4h.p. Precision, Bosch, will do 50, low built.—39, Belmont Park Rd., Leyton. [3186]

PRECISION, 4½h.p., 2-speed, F.E., handle start, Millford spring wheel sidecar, lamps, horn; £29.—1, Brackley St., E.C. [X6035]

## Premier.

PREMIER 1913 Sporting Combination, 3½h.p., Bosch, as new; £26/10.—1, Eboer St., Wandsworth. [X6154]

1915 Premier, 3-speed countershaft, shop-soiled, new; list price £63, to clear at £48.—Stacey, 12, Ecclesall Rd., Sheffield. [X5646]

PREMIER, 3½h.p., free engine, clutch, h.b.c., splendid condition; £25.—Griggs, Photographer, Folly Av., St. Albans. [3031]

PREMIER, 1914, 2½h.p., lamps, and accessories, guaranteed perfect; £20.—Smart, 14, Manor Park Parade, High Rd., Lee, S.E. [X6053]

PREMIER, 1913, 3½h.p., 3-speed, clutch, 1914 coachbuilt sidecar, all accessories, excellent condition; £40.—Braunigan, 4, Cromwell Av., Highgate. [3009]

1914½ 3½h.p. Premier, 3-speed countershaft gear, coachbuilt sidecar, excellent condition; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea. [10721]

PREMIER, 3½h.p., 3-speed, chain-on-belt, kick starter, spring clutch, countershaft, B. and B. Wilkinson's by-pass, U.H. h.b.c. mag., boxed toolbags, aluminium rubber-studded footrests, tyres, tubes, appearance and mechanical condition excellent; £66 last March, done 1,020 miles; 39 gns.—33, Jubilee Rd., Doncaster. [2916]

## Quadrant.

QUADRANT, 4h.p., 1912, 3-speed, clutch, lamps, etc.; sound bargain, £18, or exchange.—11, Luna Rd., Thornton Heath, S.E. [3084]

QUADRANT Combination, latest all-chain drive model, 3-speed, countershaft, clutch, kick start; £47/10; immediate delivery; exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [2951]

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## Better Protection for Lightweights.

**W**E have often urged the necessity of better weather protection for motor cycles of all kinds, and have also published many letters from our readers confirming that insufficient attention is given to this important subject. Now the complaints apply especially in the case of lightweight machines. For example, a letter appears in the present issue from a correspondent, who is immensely pleased with his little two-stroke except in this one particular, and his letter shows that the absence of adequate protection from the elements has deterred many of his friends from buying a similar machine.

Naturally we expect that the need will be less vital during the months which are now to come, but in this country we can never count on the absence of rain, and consequently of mud, for more than a few days at a time, though it will be admitted that the mud dries up more quickly than in the winter. We hope, however, that makers will devote some part of the summer months to this question, and that the result will be that better weather protection is provided as a standard—at least when asked for—on every machine.

Shields can easily be made at home or by an intelligent mechanic, but we should be paying a very poor compliment to the manufacturers of high-class motor cycles if we suggested that these look as well as if they were turned out at the works—in fact, they are often unsightly, though undeniably useful. Until the mudguards over the wheels are really efficient some sort of splash guards are essential. These should be made and finished to match the machine to which they are to be fitted at the works; they should, too, be quickly detachable, so that they could easily be removed in fine weather. Surely all manufacturers could supply such shields when required by their customers without much trouble or the disorganisation of their mudguard department?

Of course, we realise that there are two sides to every question, and a leading manufacturer recently remarked to us, "It is impossible adequately to mudguard a machine without making it unsightly." Again, some riders do not use their machines in bad weather, and consequently a maker is reluctant to take from the appearance of his products by adding a fitment which is not universally required, but detachable shields supplied when wanted get over this difficulty. Granted they are not handsome, but a machine and rider covered with mud look very much worse.

The mudguard question needs very thorough attention. The valances fitted to many machines are not really as much use as one would suppose them to be, for the mud runs down inside and is blown back as it drips from the edges. In the case of the front wheel, much of this mud finds its way on to the engine and the legs of the rider, and in the case of both wheels on to the forks, whence it runs down to the hubs and other parts of the machine. When covered in the wheel itself gets extraordinarily dirty, and sometimes the mud collects in the guard and blocks the wheel. This trouble has been very prevalent at the Front, where despatch riders have been in some cases obliged to stop and clean out their guards several times in a single journey, and this when delays are not only serious but also dangerous. The function of mudguards should be to arrest the progress of all mud thrown up by the wheel, and finally to return it to the road, but not to deposit it all over the machine and rider. Some mud shields raise the dust excessively in dry weather. This is because they are so shaped that they tend to direct a draught of air downwards on to the road when the machine is in rapid motion. In wet weather this draught does no harm, but when mud gives place to dry roads the effect is unpleasant and should be guarded against, if the guards are to remain in position. There is much room here for sound theory and careful experiment.





### The Vulnerable Gudgeon Bush.

A brief but telling comment is to hand from Mr. Granville Bradshaw anent my surprise at his stating that the gudgeon pin bush is one of the weakest points of many modern engines. He cites two conclusive instances. One is that of a very famous water-cooled car in the possession of a friend of his, which wore its gudgeon pin bushes one and a half thousandths of an inch in its first 2,000 miles; as he says, a very little play at this point is very perceptible in a really well-balanced engine, though it may escape notice on a vertical single-cylinder. The other is that of an equally famous aviation engine, on which strengthening webs conduct heat from the piston head to the gudgeon pin bushes. Mr. Bradshaw says that a few hours' running suffices in this case to soften the gudgeon pins and dry all lubricant out of the bushes.

### Dynamo Lighting after the War?

One of the subterranean rumours going the rounds has reference to a complete revolution in our lighting system after the war. It is freely stated (with what truth I am ignorant) that several firms interested in lighting are going to make a real slash at dynamos for solo mounts as soon as the industry is freed from munition work. I have personally made thorough tests of several leading sets and cannot yet say that I have found a genuinely satisfactory solo set. Those which I have used were invariably disfigured either by troublesome batteries or by gimcrack details in other parts of the installation. Nevertheless, I am hopeful. The Lucas sidecar equipment may be said to have solved the problem so far as three-wheelers are concerned. The weight is not excessive, the

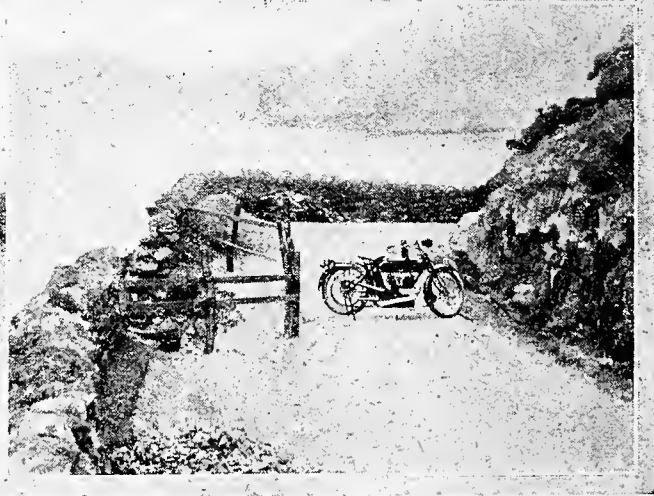
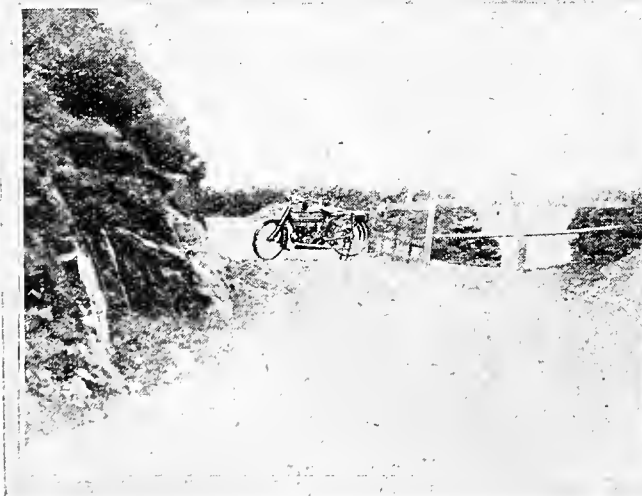
battery requires no attention except the addition of a little distilled water to the cells at regular intervals, the detail work is excellently designed and completely substantial, and the dynamo seems as reliable as a magneto, provided that its bearings are oiled every 500 miles. It is a simple matter to arrange a drive, say by Whittle belt, from a countershaft gear box.

### Electricity the Best Illuminant.

Time was—and not so long ago either—when I doubted whether the average rider would forsake acetylene in the near future. The crudest acetylene outfit can be made to work somehow, provided water and carbide are available; and a get-you-home system is a comforting possession. More refined developments, such as the Low generator and the D.A. cylinder, take a lot of beating. But, when all is said and done, there is nothing to touch the switch-on lighting systems for convenience. I am out most nights of my life just now, and I feel the difference more than I did. Moreover, I have garnered a lot of experience of first-class electrical outfits on sidecars and light cars; and I must confess that I should now plump for electricity every time so far as these vehicles are concerned. If, then, an electrical outfit of equal merit is soon to be offered us for solo work, nothing but price is likely to hinder its victory.

### Dry Battery Lighting.

Pending the arrival of improved dynamo outfits for solo machines, I have been using Hellenes dry batteries with Hunt lamps on my baby two-stroke. The head lamp does not give sufficiently brilliant a light for the best paces of which the two-stroke is capable; but,



A DANGEROUS CORNER ON THE COACH ROAD FROM COCKERMOUTH TO BUTTERMERE AND HONISTER PASS, LAKE DISTRICT.

The winter gales have swept away a portion of the wall which guards the motor cyclist from a fall into Crummock Lake at this point, and a few days ago the wall was still unrepaired, though it has been in this state since last December.

## Occasional Comments.—

after all, few of us scrap after dark, and the light is amply good enough for legal limit average. The tail lamp has a cunning little switch which no street urchin has yet discovered when the machine is left against the kerb; and the two small batteries are going strong after five months of intermittent work.

## Frequent Decarbonisations.

Mr. V. Olsson is the latest critic of my remarks about too rapid carbon accumulations in the average engine; but I am incorrigible, and believe his counter-evidence only serves to bear out my point. Mr. Olsson is one of our crack riders, *i.e.*, he may be trusted to obtain the best results, which will include such normal precautions as tuning his carburetter far better than the stock carburetter is tuned, and observing great precision in oiling. Now in these matters I always try to represent the man in the street, who in this connection will be more or less of a duffer, who will probably use the maker's carburetter setting (often something of a lottery), who will oil on the system of "when-in-doubt-give-her-two-extra-charges," and who will emphatically *not* use oil at 7s. per gallon. I may be quite wrong, but I still think that few riders among the rank and file of motor cyclists get 2,000 miles between decarbonisations without a pronounced loss of efficiency. I will alter my opinion when I meet a decent number of average duffers who get 4,000 miles on one clean-out (Mr. Olsson is not exactly an "average duffer"). Of course, my obvious motive in drawing attention to the point (whether I have innocently exaggerated it or not) is to press for more refined lubrication systems, which will reduce the frequency of decarbonisations, without making marked demands for oiling precision on the part of individual riders.

## A Garage Incident.

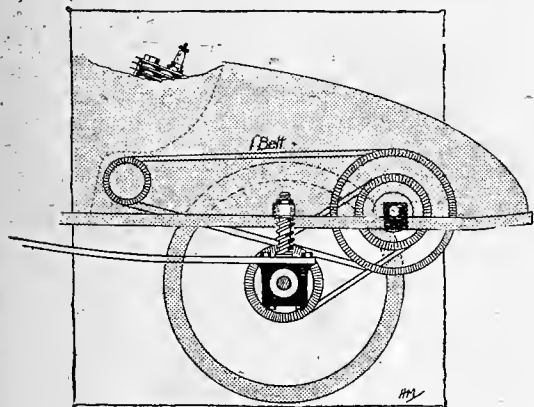
A well-known soldier motor cyclist sends the following yarn. Scene, a garage near a large encampment. Enter, Sec.-Lt. Sir Something Blank, followed at a respectful distance by a perspiring Tommy pushing a derelict two-stroke. Two mechanics welcome H.M. Forces. Derelict two-stroke is put on stand, gear engaged, and back wheel turned. Derelict two-stroke proceeds to emit noise reminiscent of a suburban lawn mower cutting a gravelly lawn. Mechanics diagnose a slipped ignition timing. Mechanics (N.B.—They are war time mechanics) feel for piston with a spoke to verify timing. Piston cannot be found. Cylinder removed in search for piston. Piston discovered in fragments at bottom of crank case. Epilogue (spoken by Sir Something Blank): "Is there much to mend?"

## Oil Straining.

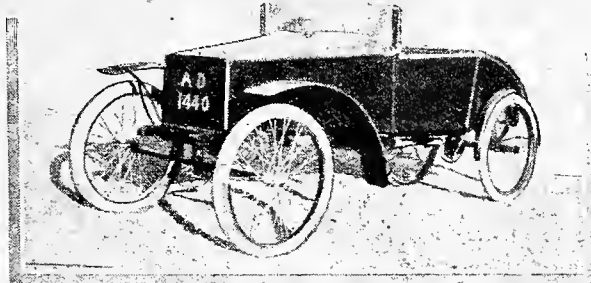
My attempts to be sarcastic proved rather incomprehensible, and a generous reader promptly replied offering to present straining gauzes to a limited number of riders. I have no reason to suppose there is an actual shortage, but merely used the manufacturer's stock wartime excuse for an ironic gibe at a firm who supplied me with some very dirty oil. I only allude to the matter again in order to publish a tip. The circumstances are that my "baby" two-stroke, afflicted with petrol lubrication, floods at intervals on every ride, because the oil is full of foreign matter, and bits of dirt get under the float needle. When I notice that the carburetter is flooding, I twist the needle round with thumb and finger pressure against its seating, and the flooding always stops immediately. This tip would, of course, be bad for the needle if the foreign matter were of a metallic or gritty nature.

## PUBLIC SCHOOLS AND THE MOTOR CYCLE.

THE cycle car here illustrated is the property of Mr. Frank Bower, now at Sandhurst, and was made by him under somewhat difficult conditions in the carpentering shops at Repton School during the Easter term, 1915. The frame is made of ash, while the body is composed of canvas and sheet steel. The engine is a 6 h.p. J.A.P., which is situated



Transmission on the Repton-built cycle car.



Cycle car built at Repton by Frank Bower, who is now at Sandhurst.

behind the seats, driving by belt a Sturmey-Archer hub gear fitted in the tail of the vehicle. Instead of a wheel there is on the hub body a belt rim which drives on to a pulley of equal diameter on the back axle. The car is suspended on five spiral springs, and is most comfortable, we are informed, on bumpy roads. The steering is by means of a shaft and chain. The body is upholstered with American cloth. Since it was first constructed the car has been greatly improved, and is, we are informed, now capable of attaining 40 m.p.h. with two up.



**W**ITH petrol at its present price and possibly higher during the coming season, economy of fuel becomes of primary importance. It is comparatively easy so to adjust carburetters to give more miles per gallon if one at the same time accepts disadvantages such as less easy starting and reduced power. As a matter of fact, the adoption of smaller jets, reduced levels, and larger choke tubes can be carried to excess, resulting in wasteful consumption because the air velocities are not high enough properly to vaporise the fuel. One desires improvements in every respect, and some successful experiments of mine with an Amac may be of service. My aim has been perfect vaporisation, giving complete combustion in the shortest practicable space of time, and these principles have also given good results in the case of the automatic carburetter on my light car.

I have a  $3\frac{1}{2}$  h.p. T.T. Rover, single speed and fixed engine type, which on average roads at an average speed nearly 50% above legal limit runs 115 miles per gallon of No. 2 petrol, and this without any attempt at economy other than carburetter alterations. It is fitted with an Amac 32 jet and petrol level as set by the Amac Co.

#### Covering the Induction Pipe.

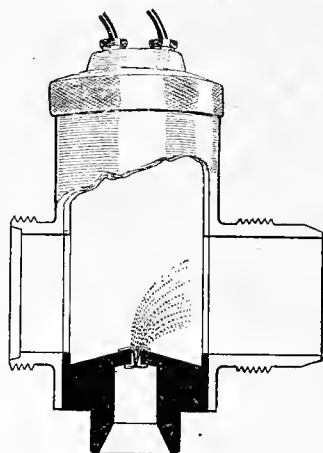
By an alteration of the vaporising jets the consumption has been improved from 85-90 m.p.g. to 110-115 m.p.g. On the Rover model in question the magneto is behind the cylinder, whilst the carburetter is behind the magneto, so that there is about 4in. length of induction pipe, and this I have covered with sheet asbestos. (When soaked in water sheet asbestos becomes pliable and can be bent into any shape without cracking; on drying up it conforms to its new position.) A greater volume of heat is thereby conveyed

## IMPROVING CONSUMPTION.

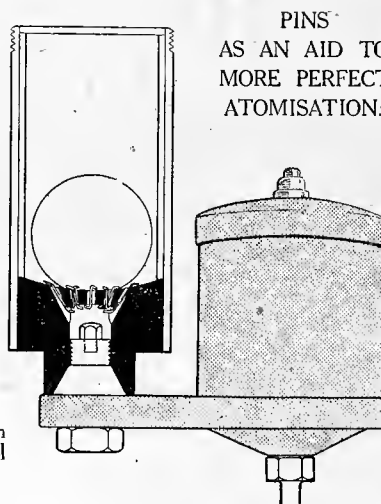
How an Amac Carburetter was altered to give a Consumption of 115 m.p.g. on a  $3\frac{1}{2}$  h.p. Machine.

to the body of the carburetter than if the pipe were exposed throughout its length to cooling breezes. The interior of the pipe being thoroughly hot precludes any vaporised petrol from condensing on the walls and drifting into the cylinder as a liquid. The alteration which effected the improvement in consumption mentioned was made as a result of watching the action of the jets whilst the engine was running on the stand. While the throttle opening and engine speed remained constant, there was no noticeable efflux of petrol, the fuel apparently being sucked by the air current direct off the tops of the holes in the form of vapour or very fine spray. As the throttle was opened a trifle, however, causing immediate increase of engine speed, comparatively large drops of petrol were noticed to jump out of the central holes. It is obvious, therefore, that with this type of carburetter, at every

acceleration of air velocity through the choke tube, drops of petrol emerge from the central holes—being immediately over the main jet—and drift into the cylinder only partly vaporised, and consequently indifferently mixed with air. This sudden efflux of petrol at changes of air velocity is inevitable. My aim, therefore, was to secure an even flow from the six holes instead of from the central pair, and, further, to break up



Method of improving petrol consumption of Amac carburetter by breaking up the petrol as it leaves the jet.



the drops at the jet instead of trusting to the heat of the induction pipe and cylinder to complete the vaporisation. It must be remembered that the carburetter in question is not fed with warm air, and that a drop of petrol travelling in a current of cool air, even at high speed, resists disintegration to a considerable extent.

#### Breaking Up the Petrol.

To obtain the best results it is essential that the breaking up of the globules of fuel should take place at the jet or jets assisted by a high velocity current of warm air, and not in the induction pipe or cylinder. Knowing and appreciating the difference between

# War Time Economy

The owner of a 1916

# Indian

## Motocycle

need have no worry about keeping garage mechanics away from their work as their services will not be required to look after his machine. In the first place it is very rarely indeed that any adjustments or replacements are necessary, and furthermore in order to enable the owner of a 1916 INDIAN to be absolutely independent of garages and mechanics the makers have issued the most complete and profusely illustrated booklet of instructions on the operation, care, and adjustment of their INDIAN MOTOCYCLES that has ever been published, and it is free to all INDIAN owners.

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What satisfaction is expressed in these words—recognise the difficulties of heavy ambulance work over any and all sorts of so-called roads which strains every part and portion of the machines.

SUNBEAMS under such a test are spoken of "IN THE HIGHEST TERMS." No better testimony is needed of the Reliability, Workmanship, and Superiority of SUNBEAMS.

Owing to the great demand for Sunbeam Motor Cycles for War purposes, the public are respectfully informed that further deliveries cannot at present be made from the Works, and those who require Sunbeams should purchase the existing stock of the various Agents who have had the foresight to provide for this contingency.

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If you are looking for a side-car combination which provides all that a passenger can desire in the way of comfort, you should order a Norton. It is a well-designed model, excellently sprung, with well finished coachwork, comfortably upholstered, and very handsome in appearance.

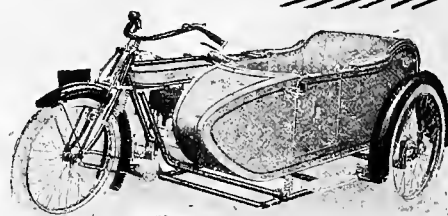
### An Enthusiastic Amateur's Opinion.

Extracts from an article by Capt. A. Lindsay, A.B., which appeared in "The Motor Cycle" on January 6th, 1916.

- ☐ "All my three machines have been Nortons, and all have given excellent service."
- ☐ "Their simplicity nearly equals that of the average two-stroke."
- ☐ "Running costs are probably as low as any other type of machine on the market."
- ☐ "I have not experienced a single mechanical breakage, and I have never failed to get home under my own power."

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4 h.p. Norton, with Sidecar.

In answering these advertisements it is desirable to mention "The Motor Cycle."

**Improving Consumption.—**

circular and annular openings, I enlarged the central holes and inserted pieces of pin, see sketch. With the central holes thus treated, another test on the machine showed that petrol emerged in drops from the outer holes, whilst from the inner ones it came out in fine spray. The obvious cure was, therefore, to treat all exits alike, except that to secure approximately the same rate of efflux the outer holes had to be less choked than the inner. As the result of experiments this effect was obtained closely enough by making the holes of varying sizes and using pins of various sizes, several small ones being better than one large one.

No drops of petrol are now visible; the spray on accelerating may best be likened to the Niagara Falls—upside down. Opening up the throttle causes an upward rush of fuel in the form of a sheet of very finely divided spray across the track of the air current.

It is of interest to consider the results of improved atomisation. Although, when the petrol reaches the cylinder in the form of drops, only a portion is burnt during the stroke and the rest is wasted, it is obvious

that when the fuel is completely vaporised the whole of it is efficiently burnt even at extra high piston speeds.

**More Power and a Cooler Engine.**

It follows also that with the same quantity of petrol more power is obtained, also that the engine will run cooler, the combustion being completed early in the stroke. In practice I find not only the improved consumption mentioned, but also extraordinarily cool running and freedom from sooty deposit; also the valves last well.

One disadvantage only I think I perceive in this system—the explosion strokes seem a trifle harsher at slow engine speeds, due probably to the extremely rapid development of the combustion. The engine is certainly more responsive to movements of the throttle, air, and ignition levers; and in the case of the air the position for best running at any moment is easily found. A little movement of the lever either way from the best position slows the engine. Finally, I may say that the alteration has not been attended with any loss of power or of speed.

J. W. G. BROOKER.

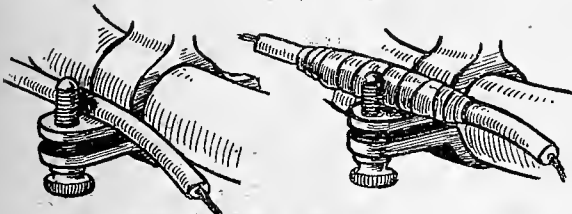
## CARE OF BOWDEN CONTROLS.

Prolonging the Life and Improving the Working.

IT is impossible to obtain the best results out of one's machines unless the controls work smoothly and easily, permitting a proper degree of delicacy in their movement, and as winter proceeds one finds scores of machines sorely in need of attention in this direction. Worn Bowden controls are often a source of trouble and annoyance, but, if properly looked after, they will wear indefinitely, whereas if neglected a single winter may spell their ruin.

**Clipping the Wires in Position.**

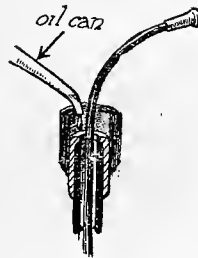
It is a good plan to go carefully over each wire, and first arrange it so that no sharp corners are formed; then bind the wire securely to the frame with insulation tape at every convenient point, taking care that it will not be trapped or strained by the movement of the handle-bars. Remember that these wires are subject to constant movement, so that if at any point they are held between two sharp or rough surfaces, the friction will speedily wear through the cover. To avoid this, wrap the cover with



Where Bowden cable rubs against screws or sharp corners wrap it round with insulating tape to prevent it fraying and wearing through.

insulation tape at all such points so that a firm pad is formed between the cover and the rough surface on which it bears, as shown in the second sketch. If the wires are carried inside the frame, they will

not be provided with waterproof covers, and therefore they will be susceptible to moisture at all points at which they are exposed to the weather. This kind of wire is easy to deal with, as one has simply to run



Method of lubricating Bowden cable.

oil over the outside of the casing and it will soak through to the cable. The objection to the naked casing is that, if kept properly lubricated, it is unpleasant to handle and leaves oily smears wherever it touches; and being exposed to the weather at certain points there is no alternative but to keep it properly oiled. Of course the most permanent job is to allow it to simmer in tallow; then remove all external grease before replacing, and, this done, it is worth while binding it to the handle-bar with a waterproof cover of insulation tape between the controls and the point at which it vanishes underground.

**Lubricating External Wires.**

External wires, provided with waterproof covers, though difficult to lubricate, seldom require oiling. Having ascertained that the casing is sound, dilute a small quantity of oil with petrol, then wrap an inch or two of the ever-useful insulation tape round the cover at the point at which the cable enters, thus forming a small cup. Into this the diluted lubricant is introduced, drop by drop, till sufficient has percolated down to reach the entire length of the cable. In a few minutes the petrol will have evaporated, leaving the pure oil alone.

If these hints are carefully followed motor cyclists will find that their Bowden wires will give no trouble and will wear indefinitely.

—H.M.B.

# HIGH-SPEED ENGINE DESIGN.

## Some Points which must be kept in View.

**T**HE modern motor cycle engine has gradually developed into an efficient high-speed engine, therefore in the following article the writer proposes to go over a few points in the design of an engine which must be capable of developing high power for a given cylinder capacity and attaining a high rate of revolution.

### Cylinders and Combustion Heads.

Naturally air-cooling must always have a big claim in motor cycle engine design, because of its simplicity and the little attention needed on the part of the owner against the extra complications, weight, and care necessary for water-cooling. The question of overheating need hardly be considered because air-cooling has been brought to an art. As an example of the efficiency of air-cooling we can take the Rudge seven-hour record made on Brooklands, in which the last hour was run at a faster speed than the first.

The design of the combustion chamber has a direct bearing upon the "thermal efficiency" of the engine. The chief shapes of combustion heads used in motor cycle engines are shown in the diagrams. Fig. 1 shows the most common type with side-by-side valves.

This form of combustion head is the most inefficient of the three shown. The area of metal in contact with combustion per volume of combustion chamber is too great when utmost efficiency is aimed at.

This design also necessitates valve caps, which absorb a great amount of heat but radiate little. The overhead inlet valve type is shown in fig. 2; this type is an improvement over fig. 1 because the metal area is less, while the design does away with the heat-absorbing valve caps. Fig. 3, in which both valves are in the cylinder head, is the most efficient from the point of view of "thermal efficiency." The gases have a direct flow into and out of the cylinder, which is a distinct advantage over the preceding types.

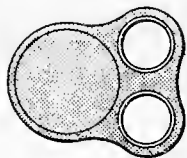


Fig. 1.

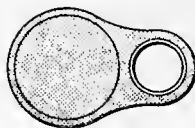
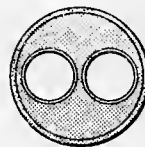
Position of valves.  
Fig. 2.

Fig. 3.

### Valves and Cams.

With respect to valve lift areas and port design, it must not be forgotten that these are controlling factors in the power developed. Large valves with streamline ports to suit are essential. In discussing valve sizes, it is the inlet which is of primary importance. We can get rid of the exhaust gases; the point is how to coax a full charge of gas into the cylinder. The ratio of the volume of gas taken in per stroke to that swept out by the piston per stroke is known as "volumetric efficiency." It is obvious that this must be as high as possible to obtain the best results. The passage of all gases should be subject to the minimum restriction. Getting the gas out of the cylinder is a positive pumping action; it is getting it in that makes or mars the engine. The four-stroke engine is a combination of pump and prime mover. The successful high-speed engine must be a first-class

gas pump, and is successful in direct proportion to its pumping capacity. Frictional resistance is opposed to the gases passing into the cylinder, therefore it is necessary to employ large valves and ports giving a direct flow to reduce the amount of friction per volume of gas passed through, so as to prevent throttling at high speeds.

Cam profiles are a matter for consideration where power is needed. The valves must be lifted quickly, and the power required to compress the springs must be as low as possible. Therefore a quick-lift cam with a large radius at the cam fillet is one of the best types. The difficulty of closing a large valve at high speeds must not be overlooked, and all reciprocating valve gear must be made as light as is consistent with safety.

### Reciprocating Parts.

It is common knowledge that light reciprocating parts are necessary for high speed and high power output. There is a common tendency to assume that a light piston is of benefit because less power is required to drive it, which is hardly correct, as whatever amount of work is actually performed in accelerating a piston from rest at the top of the stroke is all given up to

the crank pin when the piston comes to rest at the bottom of the stroke.

Heavy pistons do not call for the performance of unnecessary work, but the heavy piston causes a greater load to be put on the connecting rod

and crankshaft bearings. Every ounce taken off the piston and connecting rod weight reduces the load on these bearings by pounds. The same amount of power is given off by the explosion with either light or heavy reciprocating parts, but a light piston and connecting rod will reduce bearing loads, friction, and vibration. Therefore, with light reciprocating parts a greater percentage of the power given off by the explosion is available at the engine shaft.

### Balance.

Is perfect balance necessary in the design of a high-speed motor cycle engine? Theory says it is, but we have often to modify theory, especially in the design of a motor cycle engine. Of course, absolutely perfect balance must always have precedence where it can be applied. But the motor cycle engine is a compromise. To take an example, we cannot have perfect balance in a single-cylinder engine, but have we to scrap the single, which has made its way and justified its claim, because according to theory it is badly balanced? If we were considering the design of a high-speed engine of 50 h.p. of course a single-cylinder would be out of the question, but with the small motor cycle engine, where we can get over 3,000 r.p.m. with a single cylinder, perfect balance is not necessary, although it is to be preferred.

The usual plain bushed connecting rod bearings, which are lubricated by splash, have always been a

**High-speed Engine Design.—**

source of criticism. The hand pump splash system of lubrication is accused of being entirely inefficient, while the bronze bushes under these conditions are said to be worn out in one thousand miles in many instances. Forced lubrication is advocated in many quarters. If it were adopted on motor cycle engines, the writer does not think it would prove as great an advantage as on large engines. Forced lubrication does reduce friction, but it has been proved by test that the reduction is not in proportion to the pressure. To the writer's mind forced lubrication of a plain bearing is not finality in bearing design; the roller and ball bearings seem to have a greater claim. The ball bearing has been used for motor cycle engine main bearings with success for many years. The roller bearing has been improved greatly of late years, and now it has made good. Roller bearings have been known in different forms for many years, but without success, chiefly because long rollers were used which had a habit of twisting out of parallel with the axis of the shaft. In these early rollers wear used to take place through the rollers binding and skidding on the shaft, and serious end thrust was set up. The rollers of to-day, which have a length equal to the diameter, run with precision. A roller bearing of the same size as a ball bearing will take a greater load with little more friction, provided it is well designed.

**Small Starting Effort.**

In roller and ball bearings the starting effort is very little more than the running effort, which is a great point in their favour. With a well-designed roller bearing of nearly pure rolling action the friction is almost independent of speed. Then, again, the roller bearing needs very little lubrication—in fact, if rust could be prevented it would run nearly as well without. Oil under pressure is fed to the plain bearing with the object of keeping the bearing surfaces apart to prevent friction as much as possible. By using roller bearings we bring friction down to a minimum with-

out the complications of forced lubrication. The roller bearing is more robust than either the white metal or bronze bearing. A failure of the oil supply and bang goes the plain bearing, be it bronze or white metal; not so with the roller bearing, it would still keep running.

**Inside and Outside Flywheels.**

Which is the better position for the flywheel, inside or outside the crank case? Let us consider the claims of each. The advantage of the inside flywheel is that it is protected and out of the way in case of a fall. That is about the only advantage, while its disadvantages are that its diameter is limited, therefore it has to be made heavier to give the same turning moment, and there is always an appreciable amount of oil friction between flywheel and crank case. The outside flywheel can be made larger in diameter, therefore its weight is lighter than the inside flywheel; consequently the load on the main bearings is decidedly less; also oil friction between flywheel and crank case is eliminated. From the above it would seem that, all things being equal, the engine with the outside flywheel should give the greatest acceleration and the highest speed.

In the opinion of the writer the following points go towards making a successful high speed engine:

Air-cooled horizontal twin.

Large overhead valves with clean streamline ports.

Light reciprocating valve gear.

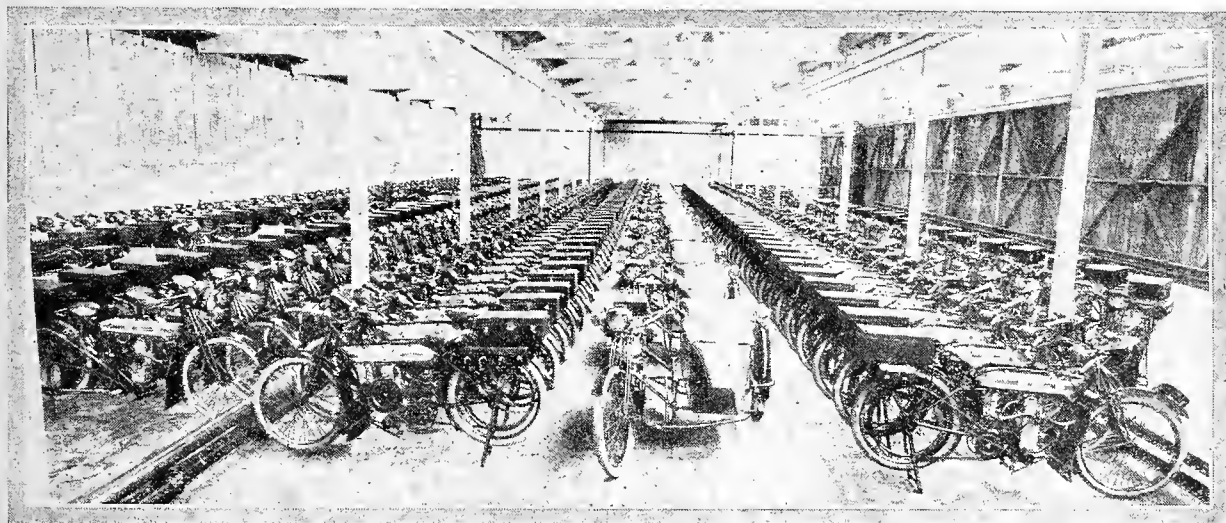
Pistons and connecting rods to be as light as is consistent with safety.

Roller bearings throughout with trough lubrication.

Outside flywheel.

Although the writer favours the horizontal twin, he thinks that the V twin or single-cylinder designed on the same lines is practically as good. Although the twins are gradually gaining favour, the single will hold its own for many years yet to come, if not always.

G.W.



THE MOTOR CYCLE INDUSTRY AND THE WAR.

A big batch of 2½ h.p. Douglas bicycles and 4 h.p. sidecar outfits of the same make ready for delivery to the War Office. It is a most imposing array, there being five long rows of solo machines, arranged side by side and close together, and two rows of sidecars.





### A Further Selection of Letters from Readers scattered all over the World.

**I**N the first issue of each month this year we have given extracts from letters received by us from time to time from our readers Overseas, believing that such an interchange of experiences will be for the general good. These letters are interesting, as they show very clearly the circumstances under which motor cycles have to work in these far away lands, where conditions are so varied and different from those obtaining here in England. It will be seen that the selections for this month are chiefly from Australia, especially New South Wales, and New Zealand, and undoubtedly the reason so many letters emanate from these countries is that of all the British dominions motor cycling is undoubtedly more popular, and is indulged in to a far greater extent, in Australasia than in any of the others, with the possible exception of South Africa. It is decidedly cheering, in reading extracts from some letters written in the cold cheerless months of January and February, to read of temperatures of 100° in the shade and upwards; of course, as everyone knows, these months are the height of summer at the Antipodes, and when one thinks of the bad road conditions, as well as these high temperatures, the difficulties under which the air-cooled engine works will be more appreciated. When one realises the varying conditions existing in the different countries it can be clearly seen that a machine which may be ideal in the eyes of the British rider is not by any means the most suitable for Overseas riding, and it is certain that there is an opening in the Dominions for more examples of specially constructed Overseas models of all-British mounts, which should be specially built and specially sold for these countries, and great business should be done by the manufacturer of these motor cycles who, realising the wants of the colonial riders, provides them with a good machine suitable for the work, and sees that it is not only supplied at a reasonable figure, but also arranges that there shall be no difficulty in obtaining spares.

It is most certainly some source of gratification for the various British manufacturers, who are now engaged producing munitions of war, to know that the Overseas demands for British-made machines are far and away in advance of supplies. Probably at the best of times the Overseas demand would exceed the total output of most of the British factories, and now that such hindrances as export licences and the great lack of boats exist, it will be clearly seen that the British manufacturer is exporting under very great difficulties.



J. Dutton, who is now serving with the Union forces in the German East African campaign. He is the builder of the motor raft described in our last issue, and also the man who underwent such unpleasant experiences in a ride from Johannesburg to Bloemhof, when water in the acetylene generator saved him from collapse. His mount is a B.S.A.

There is no doubt that the Board of Trade is a very overworked branch at the moment, but there is certainly a lot of time wasted in issuing these licences, as was shown in our issue of March 23rd, when we gave the experiences of some of the leading manufacturers on this subject. The American manufacturers have always made a fair bid for the Overseas trade by their smart business methods, and now that total prohibition of foreign-made machines has deprived riders of the home market it is likely that they will increase their efforts to gain extra business in connection with the Dominions in order to make up for the lost business here, and it is to be feared that the struggle for the British motor cycle manufacturers, whose outputs are reduced by the making of munitions, to hold their own with this renewed effort will be thus rendered more difficult.

#### A Stiff-tailed Grid.

MR. H. F. WISE, Auckland, New Zealand: "Frames break too often out here. I have had two frames break simply through the rough road conditions. Rigid frames are too uncomfortable on our roads, and I have given them up in favour of a spring frame Indian, and, having once experienced it, intend never to return to a stiff-tailed grid."

#### Handle-bar Controlled Clutch.

MR. H. C. MANSFIELD, Goulburn, New South Wales: "A handle-bar controlled clutch is a great advantage, as often we have to negotiate stretches of sand with steep banks, which make it impossible to ride the machine, consequently it has to be pushed. With the handle-bar controlled clutch, however, one can walk alongside, allowing the engine just to pull the machine."

## Overseas Letters.—

## Mudguarding.

MR. A. V. HARRIS, Canterbury, New Zealand: "Most of the machines sold here are very poorly equipped as regards mudguards, especially on the rear wheels. Spring frames with a low riding position are wanted for this country, and, above all, better mudguarding. Makers do not seem to grasp the fact that machines that may be perfect for use in the United Kingdom are sometimes useless for Colonial use."

## American Machines and Spring Frames.

MR. EDGAR BEALE, Sydney, New South Wales: "There is plenty of money here, and a splendid motor cycle trade is open to anybody who pays attention to the wants of motor cyclists. Personally, the writer uses an Indian motor cycle, but that is merely because it has a spring frame. If British manufacturers will only provide reliable and efficient spring frames I am very sure that the British machine will easily hold its own here. There is a certain prejudice against American machines, and they have not got the finish and the sturdiness of those of British manufacture. The conservatism of the home manufacturer will certainly have to be cast to one side if success is to be won."

## The Necessity of Overseas Branches.

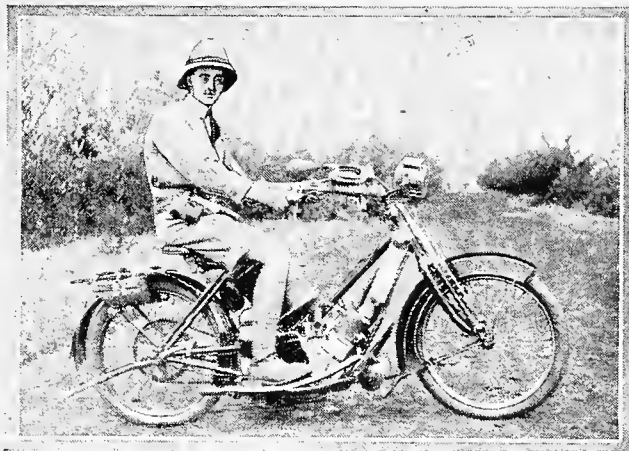
MR. C. M. THYNN, North Ryde, New South Wales: "Undoubtedly the remedy for the exorbitant and fluctuating prices demanded out here for British machines is for the manufacturers themselves to open local branches, or at least an Australasian office to safeguard their interests, and I certainly think this will take place directly the manufacturers fully realise the possibilities of the Australian and New Zealand markets. The Americans have already made a beginning in this direction."

## Difficulty of Obtaining Spares.

MR. A. B. THOMAS, Henderson, New Zealand: "One of the greatest inconveniences with a British-made machine is the difficulty of obtaining spare parts. It often takes four to six months to secure replacements. One of the largest dealers, who is sole agent for a leading make of engine, informed me, when applying to him for a new cylinder for this particular make of engine, that he did not stock spare parts. If one writes direct to the manufacturers in England they usually refer you back to their agent, so causing much delay."

## Costly Spare Parts.

MR. R. LOGAN, Botany, New South Wales: "It would be a great thing if the British manufacturers would insist that their Overseas agents are to carry a large stock of spare parts in a similar manner to the American firms. I recently required a new valve cap for my J.A.P. engine, but was unable to obtain one in the whole city of Sydney, and eventually had to have one made specially at a cost of 8s."



## A HOT PART OF THE WORLD—IN TWO SENSES.

A Scott rider in a warm corner, i.e., Nairobi, East Africa.

## No Police Traps.

MR. R. J. DYER, Little River, New Zealand: "Little River is forty miles from Christchurch. I do this journey nearly every week-end, and it usually occupies about an hour and a half—a good road and no police traps to prevent you having a T.T. if you meet another sportsman looking for trouble. Should any readers ever come over here I would be pleased to show them round. Climbing is plentiful everywhere you turn, and with good roads."

## Motoring in High Temperatures.

MR. W. E. HILLERMAN, Babranald, New South Wales: "For motor cycling out here something might be done to improve the cooling. The temperature in this district often goes as high as 160° in the sun, which necessitates liberal doses of lubricating oil to prevent pre-ignition. Repairs and accessories are very expensive in the country districts. Petrol is also a serious item. I have to pay as much as 27s. 6d. for a case containing eight gallons. At the time of writing (January 22nd) the thermometer stands at 112° in the shade, although it is only 11.30 a.m."

## Tyre Troubles.

MR. N. B. PATT, Merewether, New South Wales: "The tyres usually fitted as standard are not nearly large enough. Nearly all passenger machines here are fitted with 700×85 tyres on the driving wheel and 650×65 on all others. Very few machines are built with sufficient clearance between the forks to allow these tyres to be fitted. A puncture is a terrible business to repair out here in the hot weather, as the patches will not stick with the thermometer at 105° or more. I long for the day when detachable wheels are standard fittings. I have read about them in *The Motor Cycle*, but have not yet seen a machine with them fitted."

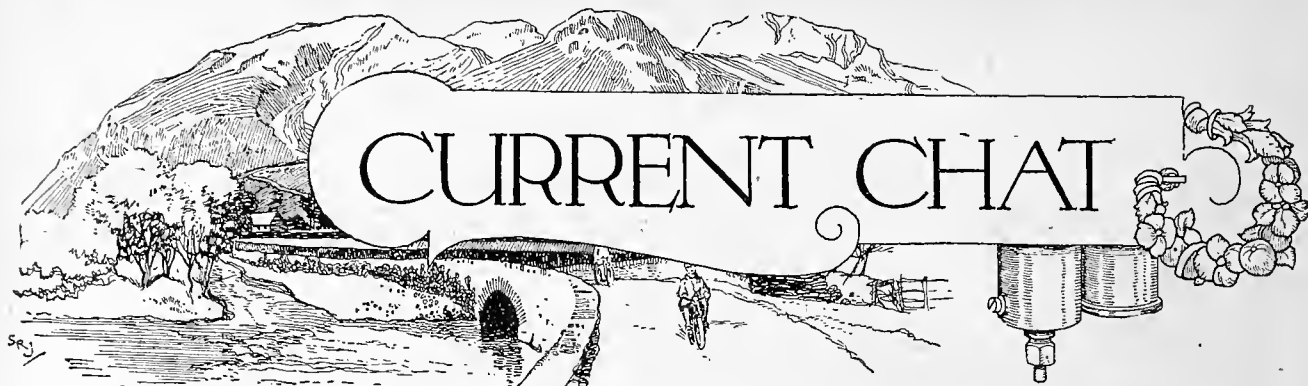
## Rough Roads Round Sydney.

MR. W. B. PYNOR, Parramatta, New South Wales: "Our famous roads would make good trial runs for despatch riders, those within one hundred miles of Sydney being almost impassable, the main road from Parramatta to Sydney, a distance of fourteen miles, being absolutely so. We have to go over one hundred miles from Sydney to get a sufficiently good piece of road to hold any long races over. A good strong machine with plenty of power and ground clearance is essential. My 4 h.p. Bradbury seems to fill the bill for solo work. American machines are now having a great vogue out here, as they are powerful machines and sold at a reasonable price."



## MOTOR CYCLING IN DENMARK.

Two of the competitors in a recent reliability trial starting and finishing at Copenhagen. Bohstedt (Indian) and Tidemand (American Excelsior).



### TIMES TO LIGHT LAMPS (GREENWICH TIME).

April 6	...	...	7.8	p.m.
" 8	...	...	7.11	"
" 10	...	...	7.14	"
" 12	...	...	7.18	"

### Next Week's Spring Number.

The *Motor Cycle* Spring Number has become an annual institution. In the next issue, dated the 13th inst., will appear articles and illustrations of a nature attractive to men in the united services and civilian alike.

### Motor Cycle Competitions.

The B.M.C.R.C. intended to run three naval and military motor cycle race meetings at Brooklands this year, but in view of the Government attitude towards unnecessary motoring, and the necessity for economy in petrol, it has been decided to abandon the idea of holding these for the present.

### The Deterioration of our Roads.

If any motor cyclist ever doubted the advisability of our spring frame campaign, let him try a motor bicycle or sidecar over one of our main roads *NO*W. Some stretches on famous highways are atrocious, and positively dangerous to single trackers in the dark if the rider happens to be a stranger to the neighbourhood.

### News!

The *Motor Cycle* was able to forecast the general tail light Order, and afterwards the new lighting regulations by means of paper discs, before any other journal. It also announced the 33½% import duty on motor vehicles last autumn before any other technical journal. It was hoped to include in the present issue the latest Budget decisions in the matter of new taxation, etc., as they affect motor cyclists.

### Birmingham Club's Open Trial.

We have already given publicity to the open reliability trial for service men and munition workers that the Birmingham M.C.C. propose holding on Easter Monday, April 24th. Trials Honorary Secretary W. H. Egginton tells us that from enquiries and entries already received the trial promises to be a success, "but we wish to make a huge success of it, and this can only be done by the aid of *The Motor Cycle*."

Judging by information with which we have been supplied the course will be a

distinctly sporting one, though no freak ascents or secret checks will figure in the programme. Arrangements are being made that will ensure a supply of petrol for all competitors. All particulars can be obtained from Mr. W. H. Egginton, 76, Earlsbury Gardens, Handsworth, Birmingham.

### Paraffin as a Fuel.

A correspondent who has made an extended test of paraffin on his 4½ h.p. James sc. tells us that he finds no more carbon deposit than when using petrol, and also that what deposit is present is softer and more easily removed.

### The A.C.U. and Competitions.

In view of the attitude taken by the Government towards the unnecessary use of motor vehicles and the impression it has created upon the public, and, furthermore, the necessity for economising in petrol, the A.C.U. has expressed its opinion that, having regard to present circumstances, no motor cycle competitions should be held during the existing conditions.

### SPECIAL FEATURES.

MORE SPRING FRAMES.  
HIGH-SPEED ENGINE DESIGN.  
IMPROVING CONSUMPTION.

### Petrol Up Again.

Petrol—that is, the petrol one can buy—has gone up 2d. a gallon, and the best quality now costs 2s. 8d. Shell best quality motor spirit still remains at 2s. 2d., but as it is practically unobtainable, the lower price is only of benefit to the lucky few who are able to obtain it.

### Racing in New Zealand.

The Pioneer Motor and Sports Club, of Christchurch, have held another race meeting on the New Brighton beach. The date was February 12th, and two events only were held. Results:

20 MILES SOLO HANDICAP.	
	Handicap.
1. G. Moffat (4 Triumph)	3m. 0s.
2. C. Bonnington (4 Triumph)	3m. 30s.
3. W. Hollobon (4 Triumph)	1m. 45s.
20 MILES SIDECAR HANDICAP.	
1. A. Woodham (10 Henderson)	scr.
2. F. O. Thomas (3½ B.S.A.)	1m. 30s.



### A WARNING TO ROAD USERS.

The devastating effects of the great blizzard of last week are now well known. At the same time it is as well to warn road users that owing to the scarcity of labour there may still be many trees that have fallen across main roads and not been entirely removed by the time this issue appears. This photograph shows a typical scene in the Midlands at the last week end.

**"The Motor Cycle" Spring Number.**

As already announced, *The Motor Cycle* Spring Number, to be published next week, will contain a number of special articles, of which the following is a summary:

**"REMINISCENCES OF BYGONE TRIALS"** is by a veteran competition rider, and is illustrated with scenes of 1909, 1910, 1913, and 1914 trials.

**"HILL HUNTING ADVENTURES IN LAKELAND."**—Needless to say, this is by G. D. Abraham, and it is illustrated by some of the author's photographs.

**"WEIGHT AND HORSE-POWER."**—An article to show the relationship of weight to cubic capacity.

**"LADY MOTOR CYCLISTS ON THE LAND."**—Miss May Walker.

**"THEN AND NOW,"** being verses of a topical nature, with a special drawing by Oswald Cunningham.

**"ANGLING ANECDOTES."**

The issue will also contain many striking illustrations.

**A Spanish Hill-climb.**

The Barcelona Motor Club held a hill-climb recently, the length of the hill being seven miles. The winner of the 550 c.c. sidecar class was mounted on a 4 h.p. Triumph outfit, and second and third places were also secured by riders mounted on machines of this make. The winner lowered the record for the hill.

**Recreative Motor Cycling.**

The dry roads and sunny sky tempted many motor cyclists out last week-end. War badges were conspicuous, and we have no doubt that, refreshed by the week-end jaunt, many a hard worker returned to work on Monday morning with renewed vigour.

**The Improvement of Hubs.**

The article on hubs in the last issue of *The Motor Cycle* has aroused great interest both among private users and manufacturers. Butterfields, Ltd., makers of the Levis, consider that the article, besides interesting readers, will have the effect of livening up manufacturers and showing them that an interest is being taken in their productions in detail. This is just what we intended.

**Motor Cycling in a Blizzard.**

A member of the staff attempted an eight-mile ride on the night of March 27th, mounted on a "baby" two-stroke, and accompanied by a friend on a 3½ h.p. twin. The journey was started at 10.30 p.m. Twelve o'clock found them both stranded four miles from home, soaked through, half frozen, and both machines refusing to move, owing to water and snow having caused the magnetos to be "too proud to spark." After a mile push through the blinding snow to the nearest village the owner of a cottage, which was the only one from which an answer could be obtained, refused shelter or assistance, and had it not been for a really sporting car owner, who was proceeding along the road and conveyed the unfortunates home, their position would undoubtedly have been unpleasant in the extreme. The good Samaritan turned out to be none other than Mr. Harry Smith, the well-known managing director of the Rover Co.

**THE BUDGET.**

On Tuesday, in Parliament, the Chancellor of the Exchequer outlined his Budget proposals. The new taxes on motor cycles are appended:

Motor cycles not exceeding 4 h.p. = £2 2 0  
Over 4 h.p. three quarters of the duty chargeable on motor cars.

Examples:

A motor bicycle of over 80 mm. bore is over 4 h.p. 81 mm. on the Treasury formula=4'67.	Tax	£3 3 0
Twin-cylinder machines from 57 mm. to 72 mm. bore.	Tax	£3 3 0
Twin-cylinder from 73 mm. to 98 mm. bore	Tax	£4 14 6

**New Identification Letters.**

The County of London now has another identification mark, the latest being L.R. Under the Motor Car Act of 1903 London had A allotted to it. Since then the following have been added from time to time: L.A, L.B, L.C, L.D, L.E, L.F, L.H, L.K, L.L, L.M, L.N, L.O, L.P, and L.R. Southampton now has a second index mark—H.O. The first one is A.A.

**Rejected Motor Cycle Experts.**

For some time past able-bodied men have been retained from service in the Army to test motor cycles for the different manufacturers, whereas, many men incapable of army work are quite well fitted for this task, not to speak of men over military age. We are not surprised to hear that certain manufacturers are now taking steps to release single men who have held badges up to the present, and one firm has asked us to refer to it any motor cycle testers who have been rejected for army service, with a view to finding positions for them.

**Blackpool Motor Volunteers.**

One night last week the Blackpool Motor Volunteers had a test call to convey 100 troops to outposts in the neighbourhood. The men were placed in cars, and the convoy was escorted by motor cyclists, the whole affair being carried out in a satisfactory manner.

**Motor Cycles in Lieu of Telephones.**

In many districts the telephone wires are still out of order, and telegraphic communication is also in many cases as often as not impossible owing to so many of the wires being down as a result of the terrific gale and snowstorm last week. In several towns the police have made use of motor cyclists to carry special messages.

**British Made—Foreign Design.**

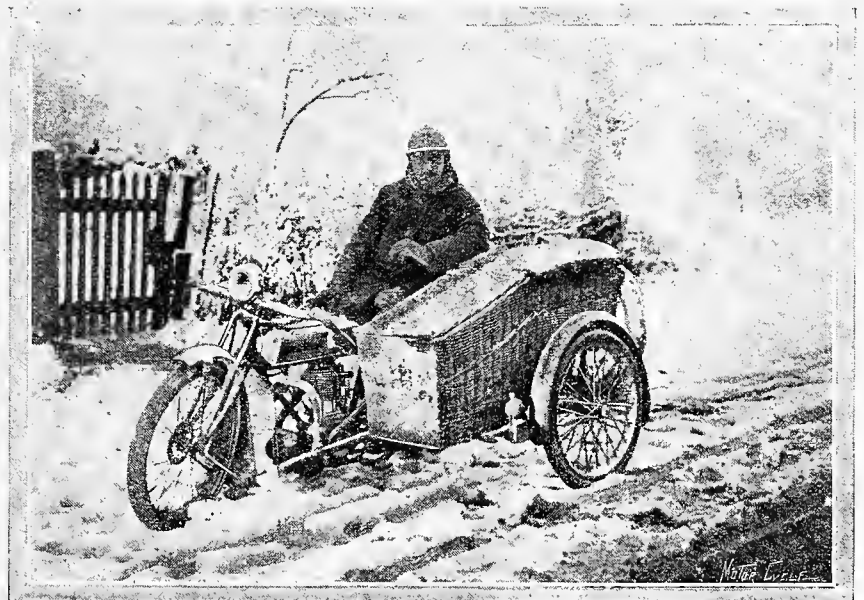
Already, the prohibition of imports of motor cycles and accessories has led to enquiries being made in this country on the question of manufacturing foreign designs in British factories. It will cause no surprise to see announcements in the near future of manufacturing arrangements for the more popular machines having been completed.

**"The Motor Cycle" Formula.**

It was in the spring of 1911 that the formula question was discussed in our pages, the old A.C.U. formula being generally considered out of date. The

first club to use the formula  $\frac{C \times T^2}{W}$

was the Lincolnshire A.C. (Motor Cycle Section) at the Grimsthorpe Park speed trials in May, 1911, though the Streatham M.C.C. considers it was first in September of that year. Just how *The Motor Cycle* were led to adopt and popularise the time squared formula will be related in an early issue.



A FRENCH MILITARY SIDECARRIER.

Our gallant Allies make extensive use of this type of vehicle for many purposes. The photograph was taken recently on one of the snow-covered roads in the Argonne, and the bicycle is a Triumph.





Triumph mounted French despatch riders attached to a heavy artillery section. Two of the machines, it will be noted, have side-carriers attached.

## SEMI-T.T. BARS FOR MILITARY MOUNTS.

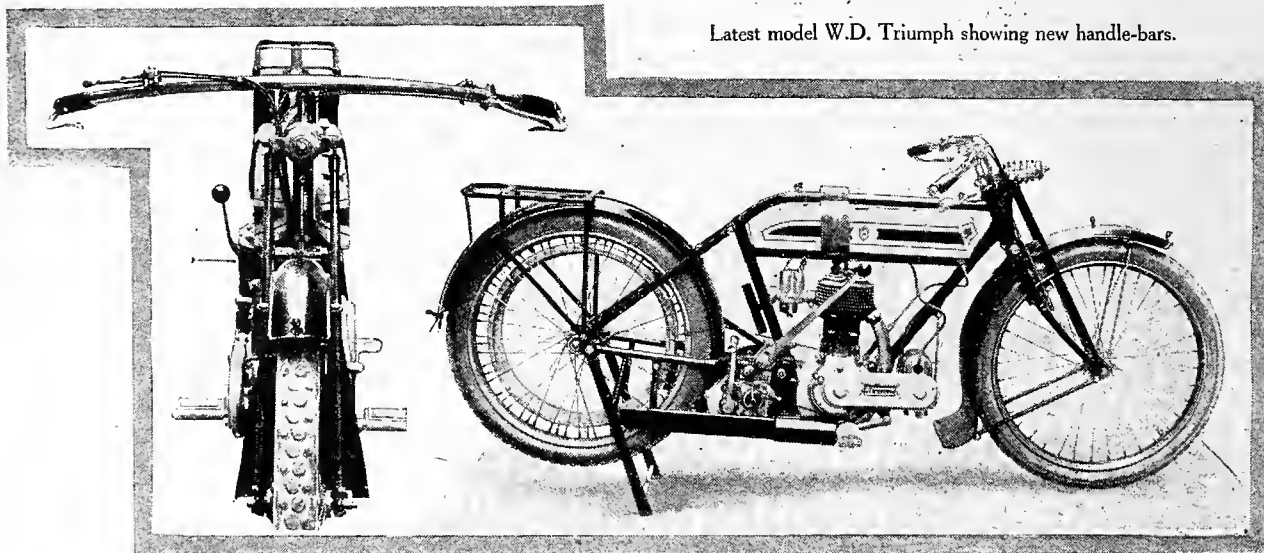
IT will be fresh in the minds of our readers that despatch riders in the different war zones have frequently complained of the type of handle-bars sent out to them for use over roads differing very widely from even the worst that Great Britain can provide. Upswept touring bars for such conditions are most unsuitable, and it has been no uncommon thing for the more practical riders to improvise a semi-T.T. bar from the touring type handle-bar to enable them to hold their machines up better in grease.

We have referred to the subject on several different occasions during the twenty months of war, and now a new type handle-bar has been standardised by the Triumph Cycle Co., Ltd., for military mounts, which is illustrated. These machines will not find their way out to the Front immediately, but our readers in the different war zones will be pleased to note the change. We have tried a 4 h.p. Triumph with the new handle-bar fitted (which, by the way, measures no less than 36in. across the grips); and it provides a wonderful

degree of control, with a semi-crouching position which is very comfortable on a long ride.

It is the more surprising that the change has been so long coming, as just before the war this type of handle-bar had really "caught on" among the sporting class of motor cyclists, and was regularly to be found on so-called standard touring machines in the different trials. We venture to think that its uses will extend on touring machines after the war, more especially when the mount is required for fast work.

Latest model W.D. Triumph showing new handle-bars.



## MOTOR CYCLE UNION OF IRELAND.

ON Monday of last week the annual general meeting of the Southern Centre of the Motor Cycle Union of Ireland was held at Jury's Hotel, Dublin.

Mr. T. J. Dumphy, the retiring chairman, presided, and moved the adoption of the report and balance sheet presented by the hon. secretary and treasurer, Mr. A. W. Mooney. The finances of the centre were in a very satisfactory state, and the balance in hand permitted the meeting to vote to each of the affiliated clubs a donation

that exceeded their affiliation fees. Mr. T. W. Murphy was elected president for the year, and Mr. A. W. Mooney was re-elected hon. secretary and treasurer.

The only matter of interest that came before the meeting under the heading of general business was the question of the government of cycle car competitions. The present state of public affairs has resulted in the negotiations between the Union and the Irish Automobile Club not being hurried along. The delegates who met the Club on the subject re-

ported that the definition of a cycle car that was agreed to limited the engine capacity to 1,100 c.c., and the weight to 7 cwt. unladen, vehicles coming under this definition to be regarded as being within the sphere of influence of the Motor Cycle Union.

The meeting decided to send forward the draft agreement to the conference with the Ulster Centre, with a suggestion that an effort should be made to get the Irish Automobile Club to agree to an increase in the weight limit, and so to include light cars.

## NAVAL AND MILITARY NOTES.



## THE RESULT OF A FALL.

WE are sorry to hear that Cpl. John C. Coney, a despatch rider with the Salonika forces, from whom we received photographs and news which were published in our issue of March 2nd, is at present in hospital with a fractured skull, the result of a spill. The latest information, however, is that Coney is making good progress.

## VARIED MILITARY EXPERIENCES.

WE were pleased to receive a few days ago a letter from Reg. Samson, whose name will be familiar to many readers, as he was an active rider, and before the war carried on business in Birmingham. Upon the outbreak of war Samson closed down his works and joined the Royal Warwicks, with which regiment he stayed until December, 1914, when he joined the Motor Machine Gun Section. Motor cycle repairers, however, being required in the A.S.C., he was again transferred. Then he took up lorry driving, and last October saw him driving a 3 ton Daimler in Egypt. He is now at Salonika, where there is a deal of heavy transport work to be done, but the lorries stand up well, considering the atrocious roads. Samson confirms information we have already received, viz., that the motor

cycles are doing well under difficult circumstances. Douglasses, Triumphs, and B.S.A.'s are the chief mounts.

## MOTOR CYCLIST AIRMEN.

R. HOLLOWAY, the one-time well-known Premier rider, is now in the Royal Flying Corps, and a brother officer of O. C. Godfrey, the Indian expert. Among the naval promotions we notice under the heading, Royal Naval Air Service, Flight Sub-Lt. J. Forgan-Potts to be Flight Lieutenant, and Temporary Flight Sub-Lt. P. C. D. Douglass to be Temporary Flight Lieutenant.

Forgan-Potts is a motor cyclist of long experience and of no inconsiderable skill. When racing was at its height he was a familiar figure at Brooklands, and usually rode a fast Indian. P. C. D. Douglass is a member of the Public Schools M.C.C. His story is an interesting one. When war broke out he was in hospital suffering from the effects of an accident, met with while riding a motor bicycle bearing the same name as his own, which severely damaged his leg. Getting well was a tedious matter for such an ardent patriot who was fretting to go for the wily Hun. But once out of hospital Douglass sought the nearest Army doctor. He was lame as

## WITH OUR DESPATCH RIDERS IN FRANCE.

(Circle) The morning shave in comfortable billets.

(Above) Heavy going during recent snow.

(Left) Douglas mounted despatch rider in winter garb.

the result of his accident, so he rolled into the room with his hands in his pockets and an "own the earth" sort of look on his face, hoping thus to hide the limp. "Strip," said the doctor. He quickly stripped to the waist, and showed an expanse of manly chest, which no doubt completely satisfied the medical man. "Now kindly remove your nether garments." The sound leg was taken out and the other left covered. "Please take them right off. H'm. That's a nasty scar. Now stand on tip-toe, place the hands upon the hips and sit down with the knees extended." Poor Douglass's knees assumed an angle of 60° and refused to obey further orders. "Thank you," said the medico, "I am afraid I cannot pass you." He then spent all his available cash upon a first-class, but expensive, car, attached himself to the R.A.C., and spent a happy six months driving military gentlemen whose hats were adorned with red and brass. Then Time, the great healer, did his duty, and Douglass became a sailor. We wish him all good luck and congratulations on his promotion.

## SALONIKA ROADS IMPROVING THANKS TO ALLIED EFFORTS.

ACCORDING to a letter recently received from an officer at Salonika, the roads in that region are improving, thanks to the efforts of the British and French authorities, who have had the assistance of hundreds of Greeks on new road construction. Perhaps we may yet see motor cycles rendered popular in Greece after the war! Our correspondent writes: "The roads here are quite good now, if a trifle bumpy, and I have had a trip or two on borrowed Douglasses, out to the Varda to see the French trenches and wire. Horses and mules are our chief care, but buffaloes and donkeys are also included at times. I, of course, left my mount—a 3½ h.p. Arno—at home, and it is doing good work in Devonshire with my sister in charge."

# SATISFACTORY PUNCTURE REPAIRS.

## Description of the Working of the Mustikon System.

**W**E have on more than one occasion referred to the Mustikon repair outfit, but it has aroused such interest that a description of the method of working will not be out of place. The Mustikon patch is a stud with a large head, made of the finest rubber. The top portion is cup-shaped, and in this lies one of the greatest advantages of the device, as when the cup portion is pressed down it forces up the inner portion and air locks the patch on securely.

### The Method Described.

In the case of a nail cut the method of procedure is as follows: The tube is folded over, and the corner of the fold where the puncture is is nipped up and cut with a pair of scissors. In the case of the outfit for lightweight machines, instead of a pair of scissors a punch is applied. We now have a small round hole about the diameter of a large French nail. The patch is then nipped by means of a special pair of pliers in the manner shown. It is in the manipulation of the next process that a little skill is required. First of all the patch is dipped in the solution, which also acts as a lubricant. The piece of tube just in front of the hole is pinched between the finger and thumb of the left hand, and the wrist is rested at a convenient

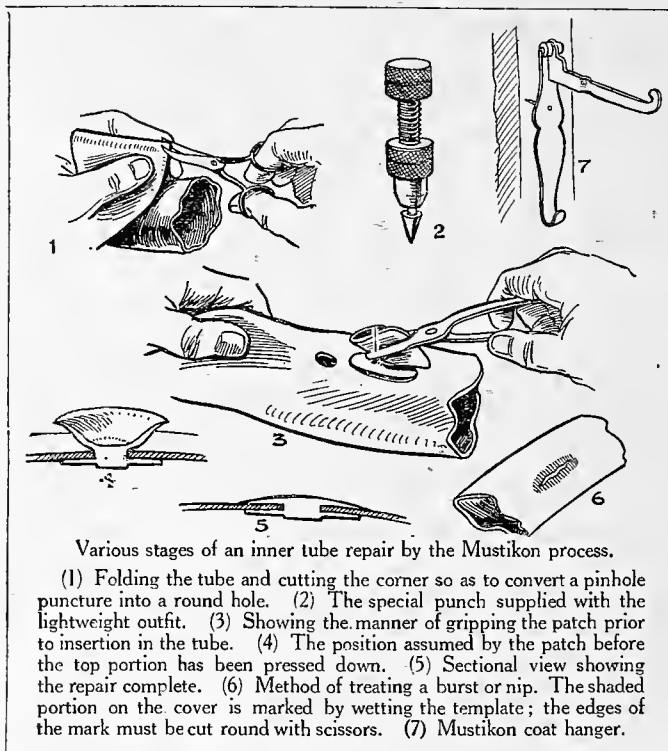
distance from the hole on the other portion of the inner tube. The device is then forcibly pushed into the hole, and a firm hold is kept at the same time upon the pliers. When the whole patch has entered the tube it is drawn backwards and then pulled forward, so that the whole of the upper portion of the patch can be lifted outside. The repair outfit can then be packed up, and by the time this is completed the outer portion of the patch can be pressed down and will adhere to the tube. Care must be taken not to allow wet solution to adhere to the pliers, or they will not grip the patch sufficiently hard.

It will be noticed that nothing is mentioned in the foregoing about cleaning the tube, as this is not neces-

sary; in fact, the patch would be almost airtight without any solution at all, owing to its locking action.

Mustikon patches are supplied in all sizes, even up to 2 in., but these latter are treated in rather a different manner. In the event of a nip the procedure is to wet the rubber template at the bottom of the patch and press this over the slit. A dark mark will then appear on the tube, which will allow the rider to see the exact amount of tube to be cut. The tube is then cut round the edges of the dark mark, and the same procedure is followed as in the case of a puncture, only in this case it is advisable to prepare the tube in the ordinary

way by rubbing it down with sandpaper and spreading a little solution round the edge. Care, of course, must be taken not to insert the patch upside down. The right way up is clearly seen, as the inner edge of the upper portion has a specially prepared surface, and the number denoting the size of the patch is clearly marked thereon. It has been said that three hands are needed to insert the patch into the tube, but we can assure our readers that this is not so if a little care and intelligence be employed.



Various stages of an inner tube repair by the Mustikon process.

(1) Folding the tube and cutting the corner so as to convert a pinhole puncture into a round hole. (2) The special punch supplied with the lightweight outfit. (3) Showing the manner of gripping the patch prior to insertion in the tube. (4) The position assumed by the patch before the top portion has been pressed down. (5) Sectional view showing the repair complete. (6) Method of treating a burst or nip. The shaded portion on the cover is marked by wetting the template; the edges of the mark must be cut round with scissors. (7) Mustikon coat hanger.

### A Complete Repair Kit.

The Mustikon outfit consists of patches, a pair of pliers, a pair of scissors, a small roll of

insulated tape, two sparking plug washers, some French chalk, a piece of copper wire, eight valve tubes, a tin of solution, and last, but not least, a most ingenious little accessory in the form of a coat-hanger. In the case of a repair on a hot day the rider often wishes to take off his coat. If he flings it over the machine, as likely as not it will become oily; if he leaves it on the ground, it will become dusty; but if a gate or tree is handy he may push the pin of the Mustikon coat-hanger into the gate post or tree trunk, and hang not only his coat but his cap securely thereon. The little coat-hanger is a wonderfully neat contrivance, is about 2 in. in length, and folds up.

**Next Week!**

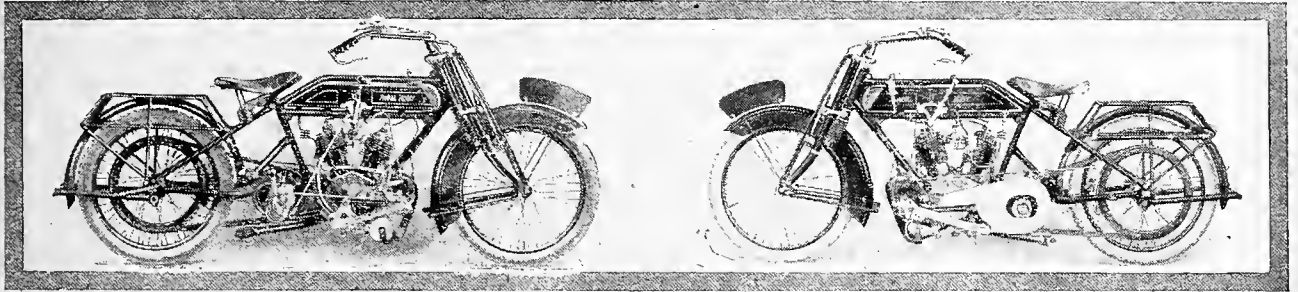
THE  
**MOTORCYCLE**

**Annual Spring Number.**

An Enlarged Issue with  
Special Illustrations.

# ROYAL RUBY NEW MODELS.

J.A.P. Engines. Jardine Four-speed Gears, with Duplicate Hand and Foot Controlled Clutch.



EXAMPLES OF TWIN-CYLINDER ROYAL RUBY MODELS.

**T**HOUGH we have already briefly enumerated some of the chief improvements in Royal Ruby heavyweight models for 1916, we have not as yet fully described the practical features of these substantially constructed machines. In spite of the many difficulties of manufacture, the general order of "no change" by no means applies to the Royal Ruby models, and it will be seen from our illustrations that these machines have been redesigned throughout, and present an attractive and thoroughly well finished appearance.

As regards alteration in the framework, three of the main frame lugs are now designed to take the sidecar attachments, the fourth connection being brazed to the chain stay, so that a thoroughly rigid four-point attachment is provided. Other important frame alterations are described later, and this year all heavyweight models are fitted with the Jardine four-speed gear box, the drive being by enclosed chain to the countershaft and belt to the rear wheel. J.A.P. engines are used throughout, and duplicate control is provided for the clutch.

## Accessibility and Strength of Frame Design.

In an accompanying illustration the rear mudguard and carrier are shown removed as one unit, this being effected by the undoing of four bolts. The carrier is of exceptional strength, and its design is particularly adaptable for the securing of tool cases, pump, and number plate. A commendable feature in the design of the mudguard is the

provision of an inside channel, which effectively prevents mud and water dripping on to the belt, which should thus prove less susceptible to slip in bad weather.

Note also the additional support from the saddle tube to the fork of the rear stays. This relieves the saddle stays of practically all strain, and they can be entirely removed in unit with the carrier without upsetting the rigidity of the frame.

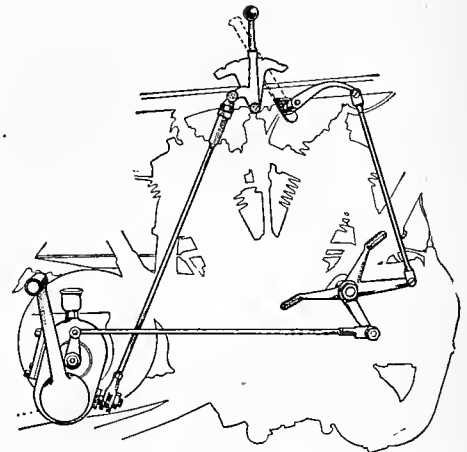
On the twin-cylinder models a well-balanced arrangement for lifting the exhaust valve tappets is arrived at by means of a spring loaded box, and pivots of ample leverage. The tank is supported from below, and is insulated from the frame by means of rubber pads.

An ingenious arrangement, to which we have previously referred, is resorted to for adjusting the height and angle of the aluminium foot plates. The principle is shown in one of our illustrations, and it will be seen that by loosening one nut the plates can be swung into any position within their range of movement.

A hand lever on the tank and a pedal to the right foot of the rider are interconnected for clutch control. This should add much to the ease of traffic riding.

The rear forks have been re-designed to accommodate the Jardine gear, and are very strongly made, being of sufficient width to permit the use of an exceptionally wide mudguard. The massive lug at the bottom of the seat tube affords a facing for the engine

cradle plates, and through it also passes the bolt supporting the chain stays, which can be removed in unit with the gear box. Thus, while affording a high degree of accessibility, the rear portion



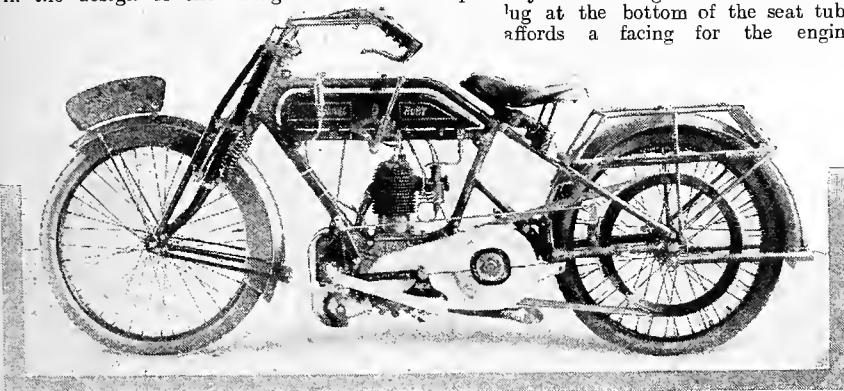
Interconnection of foot and hand control for the Royal Ruby clutch.

of the machine is designed with due consideration for the great strains it has to bear.

## Available Models.

The heavyweight models comprise— $3\frac{1}{2}$  h.p. single-cylinder (£72), 3-4 h.p. twin (£80), and 5 h.p. twin (£85), all with Jardine four-speed countershaft gear, single cork inset clutch, aluminium chain cover, and 1in. belt. The 6-8 h.p. models (£87) are provided with a double cork clutch and  $1\frac{1}{2}$ in. belt.

Having an extensive Colonial market, Messrs. Royal Ruby have seriously tried to meet the demands of the practical rider; but with regard to Colonial demands, we are constrained to criticise one comparatively insignificant point—the arrangement of the exhaust extension. We are apt to think the Colonial rider would find this rather a nuisance, and likely to act as a sprag when wheeling the machine backwards over rough ground. A neater arrangement, less likely to disturb dust or catch the ground, might easily be arrived at by employing an oval pipe, carried straight back from the silencer base.



A specimen of the  $3\frac{1}{2}$  h.p. single-cylinder Royal Ruby.



# ANNUAL MEETING of the A.C.U.

Report of the Proceedings at the Royal Automobile Club on Thursday last.

THE annual general meeting of the A.C.U. was held on Thursday of last week at 6.30 p.m.

Mr. Otto Thomas, chairman of the General Committee, was in the chair, supported by Mr. J. R. Nisbet and Mr. G. F. Sharp, vice-presidents of the Union, Mr. H. P. E. Harding, vice-chairman, and Mr. A. W. Torkington, honorary treasurer. There was present a number of members of the General Committee, and a few members of the Union.

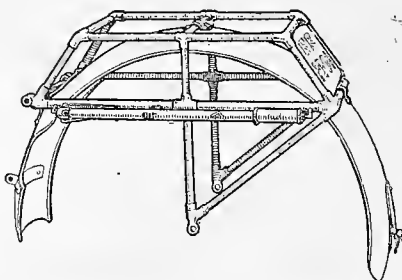
The minutes of the last general meeting, having been confirmed, the Hon. Arthur Stanley, M.V.O., M.P., was unanimously re-elected president for the ensuing year. The vice-presidents for the past year:

Professor C. V. Boys, F.R.S.,  
Mr. S. F. Edge,  
Col. Sir H. C. L. Holden, K.C.B.,  
Marquis de Mousilly St. Mars,  
Mr. J. R. Nisbet,  
Lt.-Col. Mervyn O'Gorman, C.B.,  
Mr. G. F. Sharp,  
Mr. Robert Todd,  
Mr. A. J. Wilson,  
were all unanimously re-elected.

The Chairman then presented the report of the committee for the past year as printed. He drew attention to the excellent work undertaken by the Union in recruiting motor cyclists for the Royal Engineers, and laid emphasis on the importance of the work to be undertaken by the Central Committee for the Employment of Discharged Soldiers and Sailors connected with the motor industry. He expressed the hope that through the association of the Union with this committee no motor cyclist who had served his country ashore or afloat during the present war should lack subsequent employment.

The Hon. Treasurer then presented the balance-sheet for the twelve months ended December 31st, 1915. He drew attention to the fact that, although during the past year the Union had suc-

ceeded in paying its way, and was in a better position financially than twelve months ago, there was still a deficit on the revenue account, and until this was wiped off it was deemed inadvisable to depreciate the items standing in the balance-sheet under the headings Furniture and Preliminary Expenses. The balance-sheet was adversely criticised by one member. Mr. J. R. Nisbet complimented the committee on the production of such an excellent balance-sheet during times of exceptional difficulty for such an organisation as the Auto Cycle Union. In reply to the criticisms, the Hon. Treasurer explained that investments were entered at cost, and that the increase in the value of stock was accounted for by the cost of a large



Royal Ruby rear wheel mudguard and carrier detached in one unit, the guard is provided with an internal channel, which prevents water from dripping on the belt (see page 327).

number of hotel plaques which had been ordered before the war, but were not paid for until last year.

The Chairman then stated that as no formal notice of resolutions had been received, the business of the meeting was concluded, but that he was prepared to hear any expressions of opinion from members. An informal discussion then ensued.



Scene : Any main road in the greater part of England after last week's blizzard.

## Average Prices OF Second-hand Machines.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.B.C.	1915	3 1/2 4-speed	£63	—
A.J.S.	1915	6 3-sp. sidecar	—	£82
"	1914	6 3-sp. sidecar	—	£72
"	1913	6 3-sp. sidecar	—	£48
"	1912	6 3-sp. sidecar	—	£44
"	1915	2 1/2 3-speed	£48	—
"	1914	2 1/2 2-speed	—	£39
Aillon	1916	2 1/2 2-stroke	—	£36
"	1915	2 1/2 2-stroke	£31	—
Bat	1914	5 3-sp. sidecar	—	£53
Blackburne	1915	3 1/2 3-speed	£53	—
Bradbury	1914	6 3-sp. sidecar	—	£63
"	1914	4 3-sp. sidecar	—	£47
"	1913	4 2-speed	£26	—
E.S.A.	1915	4 1/2 3-sp. sidecar	—	£63
"	1914	4 1/2 3-sp. sidecar	£38	—
"	1913	3 1/2 3-sp. sidecar	£42	—
"	1915	4 1/2 3-speed	£50	—
"	1913	3 1/2 2-speed	—	£32
Calthorpe	1915	2 1/2 2-speed	£26	—
"	1914	2 1/2 2-speed	—	£16
Clyno	1914	6 3-sp. sidecar	—	£63
"	1913	6 3-sp. sidecar	—	£51
"	1912	6 2-sp. sidecar	—	£35
Douglas	1915	2 1/2 3-speed	£45	—
"	1915	2 1/2 2-speed	£42	—
"	1914	2 1/2 2-speed	£37	—
"	1914	2 1/2 2-sp. T.T.	£37	—
"	1913	2 1/2 2-sp. kick start	£34	—
"	1913	2 1/2 2-sp. T.T.	£32	—
"	1913	2 1/2 2-speed	—	£31
"	1915	4 3-sp. sidecar	—	£59
Enfield	1916	6 2-sp. sidecar	£79	—
"	1915	6 2-sp. sidecar	£73	—
"	1914	6 2-sp. sidecar	£57	—
"	1913	6 2-sp. sidecar	£48	—
"	1912	6 2-sp. sidecar	£39	—
"	1915	3 2-speed	£42	—
"	1914	3 2-speed	£36	—
H.-Davidson	1915	8 3-speed	—	£67
"	1915	8 3-sp. sidecar	£68	—
Henderson	1915	4-cyl. sidecar	—	£80
Hobart	1915	2 1/2 2-stroke	—	£26
Humber	1914	2 1/2 3-speed	—	£25
"	1911	3 1/2 2-sp. sidecar	£22	—
Indian	1915	7 3-sp. sidecar	—	£73
"	1915	7 T.T.	—	£43
"	1914	7 2-sp. sidecar	—	£55
"	1914	7 2-speed	—	£43
"	1915	5 3-sp. sidecar	—	£62
"	1915	5 3-speed	£49	—
James	1915	4 1/2 3-sp. sidecar	—	£61
"	1915	3 1/2 3-speed	—	£48
"	1914	4 1/2 3-sp. sidecar	£47	—
"	1913	4 1/2 3-sp. sidecar	—	£40
Levis	1915	Popular	—	£23
Matchless	1914	8 3-sp. sidecar	£71	—
"	1913	8 2-sp. sidecar	£55	—
New Hudson	1916	6 3-sp. sidecar	—	£61
"	1915	2 1/2 2-speed	£22	—
New Imperial	1915	2 1/2 2-speed	£27	—
Norton	1915	3 1/2 T.T.	£46	—
P. & M.	1914	3 1/2 2-sp. sidecar	—	£60
"	1913	3 1/2 2-sp. sidecar	£38	—
Premier	1914	2 1/2 3-speed	—	£23
"	1915	3 1/2 3-speed	£44	—
"	1913	3 1/2 3-speed	£34	—
Quadrant	1914	4 1/2 3-sp. sidecar	—	£46
Rev	1913	6 2-sp. sidecar	—	£38
Rover	1915	3 1/2 3-sp. sidecar	—	£63
"	1914	3 1/2 3-sp. sidecar	—	£47
"	1913	3 1/2 3-sp. sidecar	—	£37
"	1914	3 1/2 3-speed	£38	—
Royal Ruby	1915	2 1/2 2-stroke	£22	—
Rudge	1914	3 1/2 multi sidecar	—	£38
"	1915	3 1/2 multi T.T.	—	£38
"	1913	3 1/2 multi	—	£28
"	1912	3 1/2	—	£25
"	1913	3 1/2 multi sidecar	£34	—
Scott	1914	3 1/2 2-sp. sidecar	—	£52
Sunbeam	1914	6 3-sp. sidecar	—	£74
"	1915	3 1/2 3-sp. sidecar	—	£69
"	1915	3 1/2 3-speed	—	£63
Triumph	1915	2 1/2 2-sp. 2-stroke	£36	—
"	1915	4 3-speed	—	£41
"	1914	4 3-sp. sidecar	£53	—
"	1914	4 3-speed	£38	—
"	1913	3 1/2 3-sp. sidecar	£47	—
"	1913	3 1/2 3-speed	£32	—
Wolf	1914	2 1/2	—	£18
Williamson	1914	8 2-sp. sidecar	—	£50
Zenith	1914	6 Gradua sidecar	—	£52
"	1913	6 Gradua	—	£38

# "THE MOTOR CYCLE" RECRUITING SECTION.

## Central Office for Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

## Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

**A**MONG last week's recruits for the Motor Machine Gun Service were a good many pairs and trios—chums who had decided to enlist together. In most cases it can be arranged to allot such men to the same battery.

Vacancies still exist, and experienced motor cyclists of good physique who conform to the requirements should fill up the special form or attend one of the inspections arranged.

This week's inspections were at Coventry on Tuesday, Nottingham on Wednesday, whilst on Saturday afternoon the Editor, Mr. Geoffrey Smith, will be at *The Motor Cycle* offices, 20, Tudor Street, E.C., to test candidates from London and environments. War Office acceptances will be issued to suitable applicants as usual. Motor cyclists in London and district, who have applied for enlistment stating their experience, have been notified to attend.

The object of arranging the inspections in different parts of the country is for the convenience of recruits and at the request of the War Office. A good number of men of the M.M.G.S. having come from the West Country, it is hoped to arrange a date for Bristol in the near future. A further announcement will be made on this page in a later issue.

8,092 is the total number of applications from motor cyclist recruits dealt with by Mr. Geoffrey Smith since the outbreak of war. Many letters of appreciation have been received from the authorities, as well as recruits who have been placed in the section they desired.

The terms of enlistment in the M.M.G.S. are:

Pay, 1s. 2½d. per day, all found.

Enlistment for duration of war.

Usual separation or dependants' allowance.

Age limits, 19 to 40.

Among recent batches of recruits were a number of single men who have only recently been released from Government controlled establishments. It is only fair to say that a number tried to obtain permission to enlist several months ago.

Bailey, E., Knutsford.  
Beasley, R. P., Coventry.  
Bonford, W. C., Long Compton.  
Bond, G. C., Aylsham.  
Brittin, G. H., Ramsey (Hunts).  
Brooke, G. V., Rochdale.  
Cocking, J. D., Doncaster.  
Cooper, J. V., Gateshead.  
Crawe, J. E., Tow Law.  
Cummings, W., Leslie, N.B.  
David, J. W., Wolverhampton.  
Davidson, A., Birmingham.  
Davies, T. B., Exeter.  
Debenham, W., Coventry.  
Dorricott, F., Walsall.  
Douglas, G. A., Leicester.  
Dowers, C. W., Hereford.  
Drewitt, D. C., Worthing.  
Ellis, I. B., Dewsbury.  
Escott, W. H., London.  
Gibson, Jnn., J., Edinburgh.  
Glaister, J., Whitehaven.  
Gray, F. G., Gainsborough.  
Gulshaw, J., Wigan.  
Hardy, L. E., Mexborough.  
Harrison, T., Stockport.  
Harrison, W. G., Carlisle.  
Hawkes, V., Poole.  
Heaton, H., Mexborough.  
Hill, S. G., Bristol.  
Hoban, C. W., Warwick.  
Horrocks, F., Bacup.  
James, S. A., Ystradgynlais.

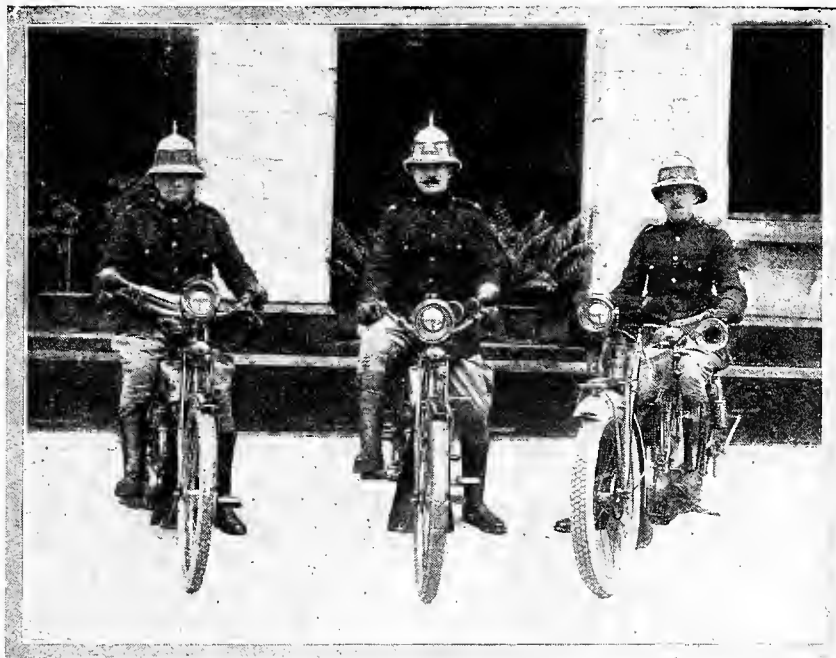
James, W. H., Smethwick.  
Jung, C. F., Southampton.  
Lorran, A. P., Cleethorpes.  
Luck, C. W., Coventry.  
Martin, W., Wolverhampton.  
Mason, W., Birmingham.  
Maude, J. E., Rugby.  
Middleton, G. S., Ramsey (Hunts).  
Murch, C. E., Exeter.  
Naish, G. V., Bristol.  
Owen, F., Leek.  
Parkin, W. E., Leeds.  
Patten, H. J., Exeter.  
Poole, A. E., Cannock.  
Race, A., Barnsley.  
Rowe, O. F., Scotstoun.  
Scammell, A. W., Frim.  
Shaw, J., Newport (Mon.)  
Shepherd, E. J., Birmingham.  
Smith, H. J., Hull.  
Smith, J., Middlesbrough.  
Statham, E. H., Coventry.  
Styring, F. R., Sheffield.  
Thorpe, A. E., Sutton Coldfield.  
Turner, R., Hales.  
Waldson, T., Leyland.  
Wainwright, H., Ruthwell.  
Wennumth, S. P., Llanccaston.  
Wheeler, E., Wolverhampton.  
Wigley, H. B., Storrbridge.  
Wilson, C. D., Halifax.  
Witcombe, A. H. V., Frome.  
Woods, E., Whittlesea.

## AN OUTER POST OF THE EMPIRE.

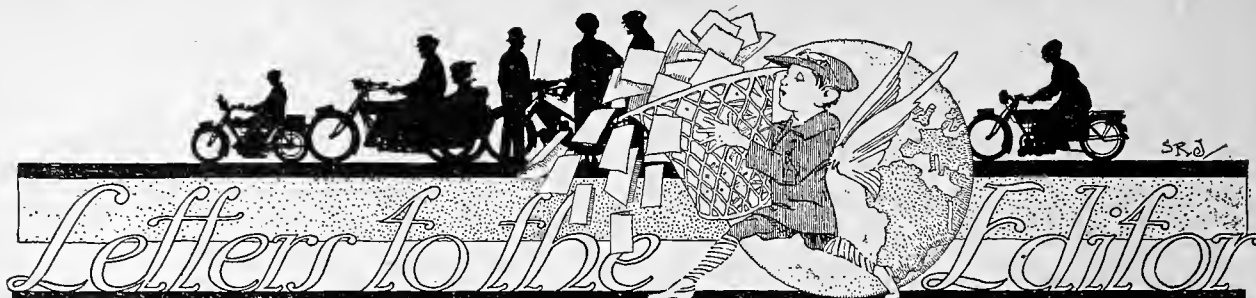
**S**INCE the war began the pages of *The Motor Cycle* have borne witness to the good work in the great cause accomplished by motor cyclists throughout the Empire. Naturally, most has been heard of men in the Army, but it must not be forgotten that many motor cyclists debarred from actual military service have volunteered for other duties, such as special constabulary, Red Cross work, National Volunteers, and a hundred and one other jobs where more fit men could be released for the regular Army and Navy.

In the latter category would be placed the three Hong Kong motor cyclists who are shown in the accompanying illustration. These men are the first members of the special police reserve, motor cycle patrol section, of that distant part of the British Empire. They have offered their services with motor cycles, the running expenses of which they bear themselves.

The Hong Kong "specials" number about 500, and include companies of English, Chinese, Portuguese, and Indians, together with a mounted section, ambulance section, and machine gun section. The duties of the mobile squad illustrated consist of night rides along deserted roads to neighbouring villages, calling at wayside police stations, etc.



Members of the Hong Kong Special Police Reserve, Motor Cycle Patrol Section. Names from left to right: P.C. Tennant (1915 Triumph), Staff-Inspector J. Clark (1914 Triumph), and P.C. Charles W. Randall (1915 Pope). The two latter have been transferred from the Hong Kong Volunteer Corps Civil Service Co.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address.

#### A Board of Selection.

Sir,—As a D.R., at present in action, who (thankfully) rides one of those machines which give "universal satisfaction," I would like to say a word or two in reply to Capt. Lindsay. Yes, if he looks at my front forks he will find the regulation leather strap. There are seventeen "universal satisfactions" in our unit, and they have all weathered this last winter without trouble (barring accidents). The reason for this tethering is in no way to provide a rigid fork, as the spring is allowed full play, but to fix a maximum limit of rebound for the spring, and if it is broken (due to any abnormal strain) to ensure the safety of the D.R.

We have numerous pot and shell-holes round here, and but for this type of front springing I venture to think that I should not now be using my original front forks. The only time this design makes a machine unroadworthy is at speed—say 45 m.p.h. and over.

A Board of Selection, which *The Motor Cycle* has suggested, undoubtedly would be a good thing, but, if formed as Capt. Lindsay mentions, I am inclined to the opinion that this type of springing would exclude all others.

HUGH D. SHAW, Cpl. R.E.

#### Top Feed Carburetters.

Sir,—The prejudice that your contributor "Ixion" says exists against top feed carburetters is inexplicable to me. Take the four points raised in his note under this head in your issue of March 30th—

*Inaccessibility.*—The operations to remove, say, the float or needle valve, for inspection in a top feed chamber are:

1. Get two spanners out.
2. Unscrew and detach petrol pipe union.
3. Unscrew float chamber cap.
4. Withdraw needle or float.

Against, in the case of a bottom feed chamber (inverted needle valve, as used by Senspray and Amac):

1. Get spanner out.
2. Unscrew float chamber cap.
3. Unscrew and detach petrol pipe union.
4. Detach needle valve clip or split cotter.
5. Withdraw needle or float.

When replacing, the top feed type has (for the novice) the enormous advantage that, as there is no need to disturb the needle valve clip or cotter at all, there is no danger of the rider forgetting to replace it correctly in its proper position when reassembling, as has often been done in instances that have come under my notice. Failure in this respect results either in the level being lowered, or, as more often occurs, being raised considerably, which is bound to produce flooding, with consequent heavy consumption, overheating, or, as some prefer to say, "over eating" (of petrol, presumably), starting difficulty, etc. In the case of the B. and B. type chamber the number of working parts (some people call them "working loose" parts) is considerably reduced in the top feed type, which cannot but be considered an improvement.

*Constant Choking of Filter Cause.*—This trouble does not apply any more to the top than to the bottom feed type. It can be cured in both cases by the simple expedient of removing the gauze altogether, as is generally done. If done, the balance is still in favour of the top feed type for the following reasons: If any grit or dirt comes through the petrol pipe it is, in the top feed type, washed right through

into the float chamber, and ultimately comes to rest in the sump or well made at the bottom of the float chamber—the petrol exit to the jet being some little distance up the side of the chamber—quite removed from the needle valve point and seating which are constantly washed clean by the incoming petrol, for the valve closes *against* the stream, and this again prevents, to a very large extent, the wear of the valve and seating, and results in much longer life, and, consequently, it is much longer before flooding.

In the bottom feed type the dirt is constantly settling down round the seating, and as the face of the valve is not washed to anything like the same extent, as the valve closes *with* the stream, any particle of 'grit' is more apt to get wedged between the valve and its seating than in the case of the top feed instrument.

*Absence of any Provision for Lowering Petrol Level.*—There is no difference in this respect between the two types. The collar, spring clip, or split cotter, or whatever arrangement is used to fix the level at the correct height, can still be "toyed" with in the same way, with either top, or bottom feed.

*Liability of Float Chamber Lid to Turn, etc.*—It is more than probable that this will occur, and nobody with the least gumption would attempt to unscrew the petrol pipe union nut without holding the float chamber cap with a spanner; but against this the rider has the satisfaction of knowing that he cannot lose his float chamber cap through his not having screwed it up tightly before starting, and would not be losing petrol through failure to make the joint between the cap and chamber edge properly. The snap-on type of cap, to which "Ixion" apparently so fondly clings, is, fortunately for present-day riders, a thing of the past, never, it is hoped, to be resurrected.

In conclusion, it may be hardly necessary to point out that "top feed" is not a new idea at all, as some would think, but appears to be another instance of the survival of the fittest, and, like the rise in income tax and other good things, has come back to stop.

TOP FEED.

Sir,—*Re "Occasional Comments"* and top feed carburetters, I think a consensus of riders' opinions would condemn this abomination with no uncertain voice. The first (and only) fifty miles of one of my machines with this fitment was marred by repeated stoppages to clear odd *débris* from the effective (?) filter of about 10 square millimetres area.

Since fitting a sensibly designed three-jet instrument, I have not had occasion to touch the carburetter in close on 1,000 miles.

ALEX LINDSAY (CAPT. R.A.M.C.).

#### Derby Groups and the M.T., A.S.C.

Sir,—*Re "Group 40's"* opinion on M.T., A.S.C., pay for Derby Groups, etc., I beg to state if our worthy friend had come up sooner, no doubt he would have received the 6s. per day; but I expect he was like a good many more men, wishing to do their share by having the plums in private jobs, while married men like myself with children gave up good jobs and came forward when the country wanted men. We shall have the conscripts next expecting high rate of pay for willingly doing their share.

EX-SOUTH AFRICAN VOLUNTEER.

Sir,—I am getting rather tired of the sort of chat written by "Group 40" in your issue of March 23rd, and there are many others here who think with me. I consider it was a

mistake ever giving the M.T., A.S.C., men six shillings a day at all. Why should the best jobs be the best paid? I should say that only about 10% M.T. men run any risk at all worth considering. Of course there was more danger at the beginning of the war. One hears much too much of the "willing to do one's bit" talk. After all, the war is not going to be won by men driving motors. The poor old infantryman on a bob a day is the man who has to do the dirty work, and I know numbers of old married men in the ranks who genuinely "do their bit" in mud and slush on a shilling a day. There is one old man I know here who was met the other day in the trenches by the General. "Why were you not in the Boer War?" said he. "Because I was too old," replied the hoary old veteran.

SUBALTERN.

### Carbonisation.

Sir,—The letter of V. Olsson in *The Motor Cycle* for March 23rd reminds me of a resolve I made recently to communicate my experience on this important item in motor cycling. Whilst always enjoying the articles of "Ixon," I must disagree with him on the necessity of dismantling the engine after 1,000 miles or so. A  $3\frac{1}{2}$  h.p. New Hudson with heavy sidecar which I own has given no running sign of carbon deposit at the end of 1,000, or even 3,000 miles. Thinking it must be necessary, I took down the engine recently to make a thorough overhaul. Remembering "Ixon's" remarks, I was surprised to find only the smallest trace of carbon deposit—so little, in fact, that there was no necessity to use a scraper—and the piston rings were quite free. I attribute this condition to two factors—

(1.) The use of good air-cooled engine oil with natural graphite (not Oildag, which is artificial) permanently suspended therein. This being a vastly better lubricant than ordinary oil, much less can be used than is generally recommended, and my consumption is less than one-third. Result, a cooler engine and so much less oil to carbonise.

(2.) The adoption of a Binks three-jet carburetter having an auxiliary air supply, which on most hills can be used as an air brake and engine scavenger with the throttle shut.

A natural result of these two factors is a wonderful improvement in petrol consumption, which by my friends is considered phenomenal. It works out at 95 m.p.g. amongst the hills of Derbyshire.

The above oil is made up by a Glasgow firm, who, I believe, has been very successful with this method of lubrication for all types of machinery.

J.P.S.

### A Two-stroke after 1,000 Miles.

Sir,—Perhaps my experience would interest some of your readers if you think it worth inserting.

My machine is a  $2\frac{1}{2}$  h.p. two-stroke, two-speed Chater-Lea, Villiers engine. I have ridden almost 8,000 miles up to the present. (I mix lubricating oil and petrol one to sixteen.) I have had the cylinder off—first time after 1,700 miles, second time after 951 miles, third time after 2,000 miles, and fourth time after 2,508 miles. Of the last 2,508 miles 508 were run on a mixture of half petrol (No. 2 Pratt's) and half petroleum (or paraffin), cheapest grade, which I am now using constantly, and intend to continue, as the engine seems to pull better on it.

I have not had any new piston rings as yet, and on each occasion on which I had the cylinder off I found the amount of carbon deposit very trifling, and distributed much as in your sketch—very little in the cylinder head, scarcely noticeable on top of the piston, and most where the gas and oil come in from the transfer passage and strike the piston. The total amount of carbon which I was able to scrape off the cylinder and piston just covered a penny to about one-sixteenth of an inch in depth, and that after 500 miles of half petroleum mixture. Inside the piston on each occasion on which I removed it was about a teaspoonful of a cinder of charred oil.

My piston has three rings—one each at top, bottom, and middle. The top one was slightly stuck at the exhaust port side for about an inch, but easily removed, and the others quite free. I would not have removed the cylinder this last time as the engine had been going exceedingly well, but when I was finishing up a forty-four-mile ride one morning the engine suddenly lost power as if the magneto spark had been retarded, and I did not find out what was wrong until I had the cylinder off, and replaced again, and had tried

everything I could think of, and at last I found that the magneto sprocket had slipped round about  $\frac{1}{2}$  in. on the armature axle. On setting this right there was no more trouble, and the engine pulled as before.

When using all petrol I could always start within a yard, sitting on the saddle, engine cold, and carburetter flooded, on low gear. I can do the same with the petrol-petroleum mixture if the engine is hot, but if cold I have to inject petrol into the top of the cylinder and it then starts easily enough.

My average riding speed is about 25 m.p.h. on the regular run which I have to take winter and summer, and I have worn out two belts, one chain, one engine sprocket, one V belt pulley on the two-speed gear, two back covers (2in. and  $2\frac{1}{2}$ in.), and one front cover. Of course, I keep the machine in good order, and mix carefully the oil, petrol, and petroleum.

The worst things I find about all machines for winter riding are the totally inadequate mudguards. I had to make special mudguards for myself—the back one 9in. wide and the front from 10in. at the number plate to 18in. when near the ground, and I can now ride in any weather, and come back without any mud on my overalls.

J.B.

### Mudguarding.

Sir,—I really think that some of us who use our motor cycles in winter have a legitimate grievance against the manufacturers in the matter of mudguards. I have a  $2\frac{1}{2}$  h.p. two-stroke machine, which in every other way is a marvel of efficiency. But on a wet road it throws up a continuous stream of mud, which covers my legs high up above the knee, the engine, the belt, and eventually most parts of the machine. I wrote to the makers, but only got the cold comfort of a recommendation to have a shield made by any intelligent mechanic. So I could: but the thing would be an obvious addition; it would not be finished like the rest of the cycle, and shortly it would rattle. It would really seem as if the makers only intended to turn out a fine weather machine. They seem to consider every part of the outfit except the rider. All that is wanted is two or three small lugs on the frame, a piece of bent sheet metal, and some fittings, the whole to be properly enamelled and fixed. If the makers only knew the amount of uncompensated comment that goes on amongst riders I am sure they would remedy this. Many a man who sees how my motor cycle goes says, "I would buy a machine like that to-morrow if only the mud could be kept off me." When I explain that the makers resolutely refuse to fit a shield, he goes and gets a Model W Douglas.

A.A.

### Lighting Tips.

Sir,—In your issue of March 9th "H.A.B." contributed an article on the disadvantage of too much tubing. His experience was that the slight pressure he was able to obtain at the rear was insufficient to keep the light in during windy weather or on rough roads. He definitely put the trouble down to the long length of tubing from the front generator. As one who has had a good deal of trouble, may I suggest that his conclusion is not quite correct? The front lamp usually has a burner of 14 litres, and the rear  $3\frac{1}{2}$  litres. Whatever pressure is given off by the generator the rear lamp only gets its proportion. Before the lighting restrictions the  $3\frac{1}{2}$  litres burner kept in very well, but now, with the necessity of diminishing the head light by about half, the rear light is similarly reduced, so it is obvious half-pressure through such a small burner is easily extinguished. I solved the difficulty by substituting a  $10\frac{1}{2}$  litres burner in place of the  $3\frac{1}{2}$  at the rear, and now get a splendid light. I must say that this burner is a little too large, and one about 7 litres would probably be sufficient. The 14 litres head light would then be twice as bright as the rear light. I did not find the length of tubing to touch the difficulty, and this can readily be proved by disconnecting the tube at the rear and fixing the generator to it. By lighting the head light it will be found to give the same size flame as if connected by a short tube. A larger burner at the rear is more satisfactory, as it means one generator less to clean and fill, and, in addition, one is able to be more economical with the carbide, by being able to reduce the pressure on both lamps, with the certainty of the rear light not failing.

C.A.L.



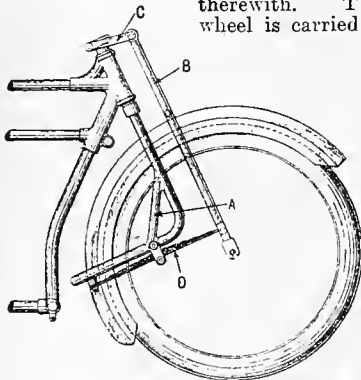
# SPRING FRAME DESIGN.

Latest Efforts to Increase Riding Comfort.

**T**HE MOTOR CYCLE campaign in favour of rear springing continues to produce designs of varying merit, and soon after the much-desired peace arrives motor cyclists should have the choice of many excellent examples. We are glad to notice that several of the larger and better known manufacturers are now turning their attention to this important part of motor cycle design. The need for spring frames is every day more felt even in this country, owing to the deteriorated state of the roads through lack of labour and war traffic, while in a number of the Overseas dominions the want is even greater.

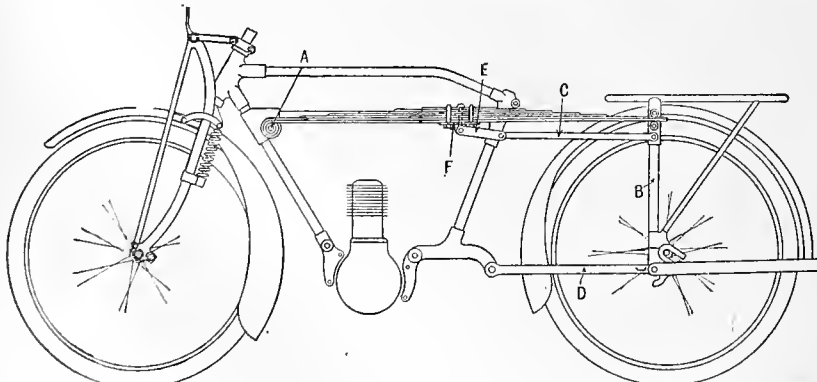
## The Douglas Cantilever Fork.

We have already illustrated and commented upon the Douglas rear springing arrangement, and now publish an illustration of a novel fork patented by the same company. This novel construction comprises a main rigid fork A attached to the steering head and swivelling therewith. The wheel is carried in



Douglas spring frame fork on the cantilever principle.

a subsidiary fork B, the upper end of which is pivoted to a link C, whilst at the lower end it has attached to it one end of a laminated cantilever spring D, the fulcrum and other end of which are attached to the main fork A. The construction is very interesting, but it should be understood that, although the device has been patented, we are not aware that it is the intention to place the fork on the market.



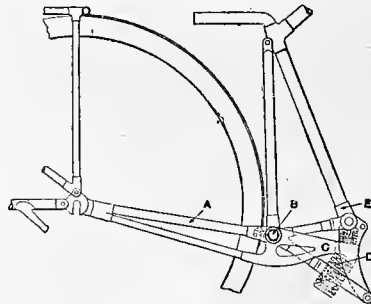
The James spring frame, which consists of grasshopper springs giving a parallel movement.

## Design by a Scotch Engineer.

The next illustration shows a spring frame which is the invention of Mr. G. Murray. The springs, of the laminated variety, are carried by a cradle which extends below the engine. The rear stays, which are bent to the correct radius, slide in sockets below the saddle, and thus prevent any lateral movement of the rear wheel. Torque rods extend from the countershaft gear box to the rear axle. We understand that a pedal cycle has been built on this principle, with satisfactory results.

## The Blanchard Spring Frame.

This is an extremely simple construction. Here the wheel, stand, and carrier are mounted at the end of a girder-like rear fork A. This is pivoted at B, and is extended beyond the pivot as shown at C to engage springs D carried by the

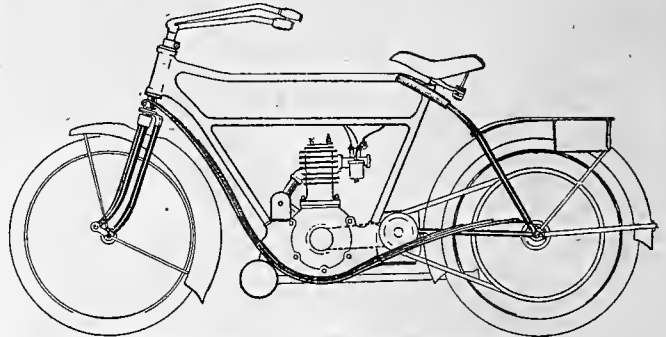


The Blanchard spring frame.

rigid frame E. It will be seen that this is an adaptation of a spring fork of the Triumph type for carrying the rear wheel. The elements employed are exactly the same, and only one pivoted joint is required.

## The James Rear Springing.

As in the Douglas spring frame, cantilever springs are used, located in the

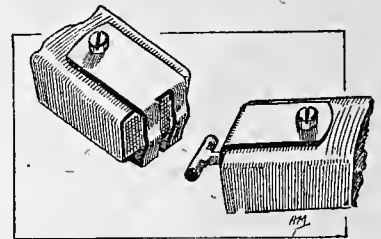


An original design by a Scotch engineer, George Murray.

same position as on the Douglas, but in this case the spring extends further forward, and is attached to a pin A, which may be specially constructed to serve for the attachment of a sidecar. Instead of the rear parts of the springs forming distance rods between the vertical fork B, the special links C are used, and are practically parallel with the pivoted chain stays D, so that the fork B rises and falls in parallel lines. The links C are extended at E, and these extensions carry the centre of the cantilever springs. The centres are bolted to a platform F, which presumably is free to pivot.

## A NEW BELT FASTENER.

**W**E have received a new and well-made belt fastener from the Hexham Motor Co., Hexham. The makers claim for it several advantages. There are two arms to take the pulling strain instead of one; consequently it has two pulling surfaces to take the wear, and this is bound to prolong its life. The ends of the belt are brought to within half an inch of each other, and

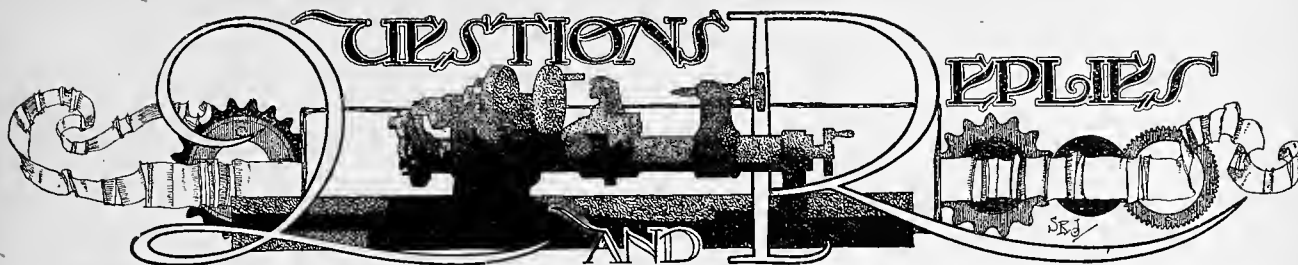


The Hexham belt fastener.

consequently these do not wear out readily. It is easy to disconnect, and, moreover, possesses the advantage of consisting of only four separate pieces, including the screws. The fastener passes over the pulley without noise, and is only 2½ in. long.

## "THE MOTOR CYCLE" IN CAIRO.

**F**OR the information of our many Service readers now in Egypt, it may be mentioned that *The Motor Cycle* may be obtained regularly from Zogolopoulo Bros., Halim Pasha Buildings, Cairo. *The Autocar* may also be obtained from the same newsagency.



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Belt out of Line.

**?** My engine pulley is an Advance, adjustable, dished out at the back to miss the boss on the crank case; but, at its lowest, with a 19in. back belt pulley, the high gear is not lower than 4 to 1, which I find too high for sidecar work. If I use a smaller engine pulley, not dished out at the back, and made to miss the boss, it would throw the belt line out by about  $\frac{1}{4}$ in. With a 5 to 1 top gear the running is improved tremendously. Do you consider that running this with the belt line out  $\frac{1}{4}$ in. will materially affect the wear of the belt; and if so, what would you advise me to do? A 21in. belt pulley would only make a slight difference, and, owing to present conditions, could possibly not be bought.—A.C.

We do not think the belt line being out only  $\frac{1}{4}$ in. would make any difference to the belt wear, though you would probably find the smaller pulley would. The only other way of reducing the gear is by fitting a larger belt rim, which, as you say, might be difficult to obtain.

### Difficult Starting.

**?** I have a Triumph, which is fitted with a B. and B. carburetter. The machine is very difficult to start. I had the magneto overhauled, but still no improvement has been effected. The machine is very sluggish in responding to throttle movement, and if the throttle is opened too suddenly the machine stops instantly.—McN.

As you have had the magneto overhauled, the most likely cause of your trouble is an air leak between the carburetter and the engine, or the carburetter badly adjusted, so that you get too weak a mixture. The sudden stoppages when opening the throttle also point to some adjustment of the carburetter being incorrect. Make sure the carburetter and jet are quite clean and adjusted correctly; also make sure there are no air leaks. Bind all doubtful points with adhesive tape. For easy starting make sure the contact points on the magneto are separating correctly (the gap should be exactly .4 mm.) See that the rocker arm is not sticking. Plug points should be clean and a gap of about  $\frac{1}{32}$ in. See that the valves are free in their guides, and the springs in good order. Do not give too wide a throttle opening at starting, and close the air. For an easy start a rich mixture and very little of it is what is wanted.

### Legal Silencer.

**?** Would you please inform me if my exhaust pipe is legal? My machine is a  $3\frac{1}{2}$  h.p. Premier (1914), with auxiliary exhaust pipe, as well as the usual exhaust pipe to the silencer. I have removed the extended exhaust pipe, which is  $1\frac{1}{2}$ in. in diameter, and fitted one 16in. long, 2in. in diameter at the silencer end, and 2 $\frac{3}{4}$ in. at the tail end. Would you please advise me if this is legal?—H.J.E.

Provided your machine is fitted with a silencer or expansion chamber, which reduces the sound of the explosion as far as can reasonably be expected, your machine conforms to the regulations. The fitting of an extension outlet pipe is not really necessary, but it is undoubtedly the best way of silencing a machine without causing undue back pressure.

### THURSDAY NEXT!

THE  
MOTOR CYCLE

### ANNUAL SPRING NUMBER

### Painting the Cylinder.

**?** Will you kindly inform me what cylinder paint (black), either home-made or manufactured, you consider most suitable for the cylinder of an air-cooled motor cycle engine? My motor cycle has been stored during the winter months, and I now find the cylinder very rusty, so thought painting would be the best method of hiding the rust. Can you suggest a better remedy?—N.A.C.

To obtain the best cooling effect, the cylinder is much better left unpainted, as the paint only prevents perfect radiation of heat. There is little to choose between any of the preparations sold. These can be bought from any accessory house. It is fairly satisfactory to use ordinary blacklead, as used for stoves. It should be mixed into a thin paste with a little paraffin, and then brushed well over the cylinder flanges, leaving as thin a coat of blacklead as possible. Before applying any of the paints, as much of the rust as possible should be removed with paraffin.

### Age for Driving Licence.

**?** At what age can a boy get a motor driving licence? Is there any difference between the age for taking a cycle or car driving licence?—E.J.

A licence to drive a motor cycle only may be obtained at the age of fourteen, but to drive a car seventeen is the age limit.

### Valve Timing.

**?** My engine is a 6 h.p. twin with mechanically operated valves. My difficulty is this. There is a great clearance, or space, between the inlet valve stems and tappets, as much as the thickness of a two-shilling piece. The exhaust valve stems and tappets have the correct clearance—almost touching. If I add tappet adjusters, or longer tappets, the inlet valves open before the exhausts close. If all the clearance is taken up they open decidedly earlier than should be. My engine is now timed correctly, I believe. The exhaust closes when the piston is one-sixteenth down suction stroke and the inlet opens when the piston is one-eighth down suction stroke (the makers' formula). The inlets appear to have the same lift as exhausts. Where is the trouble? I am told the running of the engine would be improved by the great tappet clearance being taken up.—H.C.

The clearance between the tappet and valves should certainly be taken up. Unless you have either new valves or new tappets, the only way is by inserting tappet adjusters, such as can be obtained from most large accessory stores. Many engines are timed with a slight overlap in the valve timing, such as you say occurs when the clearance is taken up; but if this overlap upsets the running of the engine the timing must be reset, which can be done very easily if separate cam wheels are fitted for the inlet and exhaust valves. We think you would obtain the best results by setting the timing as follows: Exhaust valves to close with piston exactly on top dead centre. Inlet valve to open immediately the exhaust has closed. If these settings are made correct, the opening of the exhaust and closing of the inlet will come automatically correct. There is nothing gained by keeping the exhaust valve open after the piston has reached the top of the scavenging stroke, whereas a fairly early opening, anything up to  $\frac{1}{4}$ in. from bottom of firing stroke, is most valuable. We fancy your present timing is rather on the late side.

### Position for Contact Breaker.

**?** I have taken apart the magneto (Bosch, type DA2) of my motor cycle, removing the end plate on contact breaker side, and withdrawing the armature from the opposite end. When I came to put this together I was at a loss to know the position of the contact breaker in relation to the armature, as I cannot find any marks. Also I notice that the armature rubs on the field magnet; in fact, it has a distinct knock when armature is revolved. Would you tell me also what is about the correct size jet for B. and B. for use with 3 h.p. engine?—A.R.

The contact breaker on all magnetos is keyed in position, so unless this key has been damaged there should be no difficulty in ascertaining the correct position, otherwise it is necessary to fix the contact breaker in such a position that when the ignition lever is fully advanced the armature should be just breaking away from the magnetic fields, that is, the metal portions of the armature should be at the top and bottom, while the contact points should be just about to break. We think you will find that there is either a key to secure the contact breaker or else some sign of where there has been one, which will guide you, and which we would advise you to have replaced. The armature should run extremely close to the pole shoes, but should not actually touch; if it does, it indicates that either the bearings are worn or the end plate is not screwed up in the correct position. The correct jet can only be found by experiment, but from 28 to 32 should be about right.

### Missing Fire on Pilot Jet.

**?** (1.) I should be obliged if you would tell me the cause of the misfiring of my 7 h.p. Indian at speeds below 20 m.p.h., especially on the pilot jet. The back cylinder has good compression, but the front is rather poor, and appears to have been overheated. I have had new valves ground in and new springs. The machine is very fast and powerful, and I am at a loss to know whether it is the piston rings or the timing. There is a good spark at both plugs. (2.) How is the cylinder taken off?—H.R.

(1.) Your trouble is not likely to be due to either the piston rings or timing. The most likely cause of the missing is the plug points being adjusted too closely together. On these machines on the pilot jet a wide gap, say  $\frac{1}{8}$  in., is necessary. Another likely cause—air leaks in the induction pipe; or the pilot jet air regulator, situated on the top of the pilot jet tube, may be incorrectly adjusted. Try varying this while the engine is running. Lack of compression in the front cylinder is probably due to insufficient lubrication. Adjust the mechanical lubricator to feed more oil to this cylinder. (2.) If your machine has detachable heads it is first necessary to remove such fittings as the carburettor and inlet

domes. These domes are secured by bayonet joints, and are sometimes rather difficult to remove owing to having become set with burned oil, and care will have to be taken not to damage the thread which secures the inlet pipe. After these and any other fittings have been removed, detach the cylinder heads by undoing the four holding down nuts, then two of the long cylinder studs should be removed from the crank case, after which the cylinders may be lifted off sideways.

### Rebushing the Connecting Rod.

**?** I am anxious to dismantle my 4 h.p. engine in order to have the big end of the connecting rod rebushed as it has become slightly worn, and, consequently, knocks somewhat. If you will give me a few hints as to how to detach the connecting rod from the engine-shaft I shall be pleased. There is a chain sprocket wheel on one side of the crank case which carries the drive to the magneto. This is held in position by a nut. (1.) Has this nut a right-hand or a left-hand thread? (2.) How are the flywheels fastened on to the engine-shaft? (3.) Am I likely to have any great difficulty in getting the piston and connecting rod off the engine-shaft? I am not an engineer, although I attend to the general care and little repairs which my motor cycle needs.—J.B.

Unless you are fairly skilled in the use of tools we would not advise you to try and take the flywheels apart yourself for rebushing the big end, as putting them together and truing them up again after the work has been completed is work for a skilled mechanic. (1.) This nut has a right-hand thread. (2.) The flywheels are attached to the crankshaft on tapers, on to which they are secured by locking nuts, which have to be very securely screwed up. (3.) Unless you have done work of this kind before you are likely to have considerable difficulty in driving the flywheels off the taper without damaging the thread of the crank pin. The work is fairly straightforward to anyone skilled in the use of tools. The whole engine will have to be removed from the cycle, and the cylinder and fittings removed. Then remove the pulley, also the small timing pinion. Open the crank case and remove the flywheels and connecting rod. We would then advise you to remove the piston by driving out the gudgeon pin, after first removing any set pins and other means by which this is prevented from moving. If no such fitting is present, the pin is probably only a taper fit, in which case drive the pin from the narrower end. You can then separate the flywheels by removing the lock nut on the crank pin, and drive the pin out of one of the flywheels. You will probably find a piece of brass and a hammer most suitable for this, or use a copper-headed hammer. With care it is possible to remove the small end bush from the connecting rod and replace it with a new one without

entirely dismantling the engine. By making a special tool out of a long bolt and nut the old bush can be drawn out of the connecting rod without liability of straining the rod. The new bush should be forced in in a similar manner. It will probably be found that after forcing into position the gudgeon pin will not fit the bush properly. The bush will then require reaming out to the correct size. While these operations are being performed it is advisable to cover the crank case opening with a piece of rag.

### EXPERIENCES WANTED.

Readers desirous of obtaining the experience of others with various motor cycles or accessories must enclose a stamped addressed envelope in which the replies may be forwarded. Answers to the queries should be addressed c/o The Editor.

"J.W.H." (Maidenhead).—Philipson pulley and Grado multi-pulley, for use on  $\frac{3}{4}$  h.p. free engine Triumph.

"J.C." (Cambuslang).—6 h.p. Lincoln Elk and sidacar. Reliability, consumption, and durability.

"A.C." (Notts).— $2\frac{1}{2}$  h.p. Allon. Speed, hill-climbing power, and consumption.

"H.A." (Woodford).—Spots. Amount of increase in petrol consumption; decarbonising effect.

"A.C." (Bude).—7 h.p. Power-plus Indian. Suitability as a solo mount, consumption, and ease of control in traffic.

### RECOMMENDED ROUTES.

SHREWSBURY TO EVESHAM.—M.B.

Shrewsbury, Bridgnorth, Kidderminster, Worcester, Evesham.

KIRKBY LONSDALE TO MORETONHAMPTON.—D.L.R.

Kirkby Lonsdale, Arkholme, Lancaster, Garstang, Preston, Wigan, Warrington, Tarporley, Whitchurch, Hodnet, Wellington, Bridgnorth, Kidderminster, Worcester, Fewkesbury, Gloucester, Painswick, Stroud, Nailsworth, Bath, Marksbury, Wells, Glastonbury, Durs-ton, Taunton, Wellington, Cullompton, Exeter, Moretonhamstead.

LEICESTER TO SOUTHPORT.—H.G.K.

Leicester, Ashby-de-la-Zouch, Burton-on-Trent, Uttoxeter, Stone, Pipe Gate, Moore, Nantwich, Tarporley, Chester, Birkenhead, by ferry to Liverpool, Great Crosby, Formby, Southport.

MARGATE TO HITCHIN, VIA SOUTH WOODFORD.—H.C.T.

Margate, Canterbury, Faversham, Sittingbourne, Chatham, Gravesend, ferry across river to Tilbury, Upminster, Romford, Chigwell Row, Woodford Bridge, George Lane, South Woodford, Chingford, Ponder's End, Enfield, Potters Bar, Hatfield, Welwyn, Hitchin.

### PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always having their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

**AUSTRALIA'S PREMIER MAN,  
ENGLAND'S PREMIER MACHINE,  
Both make good in Australia.**

*"Use that stick wherever  
it's necessary BILLY, and  
Australia is with you to a  
man. The harder you hit,  
the better we'll like you."*

Just as efficiently as Mr. Hughes, Australia's  
premier man, is wielding in England to-day  
his baton of Victory, so, too is the

# Douglas

England's premier motor cycle, continuing its triumphant  
career throughout Australia. Its latest victory in the  
**COURSE de CIRCUIT OF AUSTRALIA**,  
held at HARTLEY, N.S.W., on Anniversary Day, Jan. 26th,  
was indeed a surprise, for a little "2½" h.p. DOUGLAS  
—although compelled by the handicappers to concede  
two minutes in a hundred miles to a big "8 h.p." TWIN,  
succeeded in obtaining

**SECOND :: AND :: THIRD.**

In the **SOUTH AUSTRALIAN Annual HILL CLIMB**  
held on SELICKS HILL, a gruelling climb, three and a half  
miles long, H. J. GARD, on a "2½" DOUGLAS, GAINED

**FIRST, 350 c.c. CLASS**

**SECOND, 500 c.c. CLASS**

**THIRD, 1,000 c.c. CLASS**

competing against the world's representative machines.

In the **RELIABILITY HILL CLIMB**,  
held on MOUNT LOFT RANGE, S.A., the "4 h.p."  
DOUGLAS and SIDECAR EASILY

**GAINED : SECOND : AWARD.**

**DOUGLAS BROS., KINGSWOOD, BRISTOL.**

Ben Jordan  
in the  
'Sydney  
Sunday  
Times.'



# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.,** and crossed.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### Abingdon.

**ABINGDON** King Dick Canoelet Combination, 1915, 5-h.p., 3 speeds, in first-rate condition; £48.—John Alison, Dalkeith, Midlothian. [X6616]

**1913** 3½-h.p. Abingdon, 2-speed, hand clutch, pan saddle, speedometer, Lucas, tyres and condition as new, under £500; £29.—Kilby, Oak Cottage, N. Farnborough, Hants. [X3225]

### Advance.

**ADVANCE** 7-h.p. Twin Combination, 2-speed countershaft, Bosch, L. and B.; £20, or offer.—87, New Park Rd., Brixton. [X3499]

### A.J.S.

**1915** 2½-h.p. A.J.S., 3-speed gear, as new; £45.—Don Guy, Weymouth. [X3433]

**A.J.S.**, 1916, 6-h.p., actually in stock.—Crow Bros., 190, High St., Guildford. [X3517]

**A.J.S.**, 2½-h.p., 2-speed, clutch, climb anything; £21.—Hodges, Redland Rd., Bristol. [X6720]

**1916** A.J.S., 6-h.p., brand new; £84.—Hickings, Small-dale, Lottom Bradwell, near Sheffield. [X6251]

**JULIANS**, Broad St., Reading. 'Phone: 1024.—Immediate delivery of all A.J.S. models. [X2833]

**1916** A.J.S. 4-h.p. Combination in stock.—Williams, A.J.S. Expert, Chapel Ash Depot, Wolverhampton. [X6691]

## Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone: 766.

Telegrams: "Perfection."

### NEW 1918 MODELS.

LEVIS, 2½ h.p., 2-stroke	£32 0
SUNBEAM, 3½ h.p., 3-speed	£73 10
SUNBEAM, 3½ h.p., coach Combination	87 gns.
EXCELSIOR (American), 7 h.p., 3 speeds	£75 0
CALTHORPE Junior, 10 h.p., 2-seater	185 gns.
NEW IMPERIAL, 2½ h.p., variable magneto	£38 0
OVERLAND, new, 15-20 h.p. model, 2-seater	£265 0
OVERLAND, 12 h.p., 4-seater, electric starting, etc.	£225 0
DOUGLAS MODELS	Orders booked now.

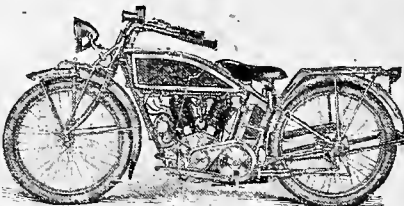
### (U.S.A.) EXCELSIOR.

1916, 7 h.p., twin, 8½ × 89, mechanical and hand lubrication, kick starter, high-tension magneto, spring forks, 2-gallon petrol capacity, 3-speed countershaft gear, multiple disc clutch with hand and foot control, handle-bar control, spring scapillar, 3in. non-skid tyre, finish Excelsior grey; latest 1916 model, £76.

Exchanges quoted. Easy payments arranged.

We are sole Yorkshire distributors. Liberal terms to trade.

Coachbuilt PERFECTION SIDECARS to suit. £13 10



### NEW 1915 MODELS.

*CONNAUGHT, 2½ h.p., 2-speed	£41 16
*WOLF-J.A.P., 2½ h.p., 2-speed	£38 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed	£39 10
*ROYAL RUBY, 6 h.p., 3-speed	£87 0
U.S.A. EXCELSIOR, 7 h.p., dynamo lighting	£71 10

\* Cash offers wanted.

### SOLO MACHINES.

1915 4½ h.p. 2-sp. LINCOLN-ELK, as new	£38 10
1914 NEW IMPERIAL, 2½ h.p., 2-speed	£26 10
1914 3½ h.p. 3-speed ARNO	£29 10
1913 3½ h.p. ROVER, 3 speeds, free engine	£37 10
1913 3½ h.p. ROVER, Grado gear	£27 10
1912 3½ h.p. ZENITH-GRADUA	£26 10
1912 3½ h.p. 2-sp. BRADDER, chain drive	£29 10
EXCELSIOR, 3½ h.p., 3-speed, Druid forks	£19 19
2½ h.p. 2-speed DOUGLAS	£24 10
TRIUMPH, 3½ h.p., 1912 T.T. model (touring bars)	£26 10
KERRY, 3 h.p., magneto, Saxon forks	£9 15
N.S.U., Twin, 2-speed, spring forks	£15 10
REX, 3½ h.p., magneto, spring forks	£14 10
DOUGLAS, 2½ h.p., twin, spring forks	£15 10
TRIUMPH, magneto spring forks, new tyres	£18 10

### SIDECAR COMBINATIONS.

Brand New 1914-15 6 h.p. REX Sidette	£63 10
1914 6 h.p. REX Sidette, almost as new	£49 10
V.C. WILLIAMSON 3-speed Cy-cla (new)	£89 15
QUADRANT, 7-h.p. 2-speed, twin, chain drive, and coach Sidcar. Fine lot	£49 10
1910 6 h.p. REX, 2-speed, and Sidcar	£24 10
1912 3½ h.p. 2-speed PREMIER and Sidcar	£33 10
1910 3½ h.p. 2-speed REX and Sidcar	£24 10

### MISCELLANEOUS.

1914 2-seater FORD, hood, screen, etc.	£79 0
ROVER, 8 h.p., 4-seater, all on	£49 10
WILLIAMSON 3-speed Cy-cla (new)	£126 0
MORGAN, 1913, de luxe, hood, screen, etc.	£69 10
PREMIER 7-h.p. 2-seater Car	£67 10
RITZ, 10 h.p., 2-seater (new)	£145 0
SINGER, 1914, dynamo lighting	£180 0
1915 GLORIA Coach Sidcar, almost as new	£12 10
SUNBEAM, 1916, new Sidcar	£17 17

## IMPORTANT NOTICE.

Owing to the Easter Holidays, the issue of "The Motor Cycle" for April 20th must be closed for press earlier than usual. All copy and instructions for Miscellaneous Advertisements in that issue must therefore be in our hands not later than first post on Thursday, April 13th.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**A.J.S.**, 1913, 6-h.p., Jenbro sidecar, hood, speedometer, Pillion seat; £55.—St. Mark's, Old Tivil Rd., Maidstone. [X3550]

**A.J.S.**, 4-h.p., and sidecar, 1916 model, just delivered, £93/17; also 1916 2½-h.p. model, £58.—Turpins, 22 and 29, Preston Rd., Brighton. [X7116]

**1915½** A.J.S., 2½-h.p., 3-speed, T.T., perfect order, Lucas lamps and horn, Stewart speedometer, owner called up; £53/10.—Robshaw, Jackson House, Roundhay, Leeds. [X6639]

**1915½** A.J.S., 2½-h.p., sporting model, 3-speed countershaft, handle-bar clutch, fully equipped, 60 m.p.h., as new; 45 gns.—Toward, Heathurst Vale of Health, Hampstead. (D) [X3403]

**A.J.S.**, 1915, 6-h.p., new combination, with apron, spare wheel and tyre, complete; cash £110/2, or by deferred payments 2% only extra; from stock.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [X3313]

**6** h.p. A.J.S., 3-speed, and chain drive, fitted with handsome Skiff 1916 Mills and Fulford coachbuilt sidecar, handsome turnout, includes Lucas lamps and hooter; good bargain, £73/10, guaranteed.—Wauchope's, 9, Shire Lane, London. [X6699]

**A.J.S.**, 6-h.p. (December, 1914), with detachable back wheel, 700×80 tyre, and 650×65 combination front, lamps, horn, Terrys spring links, Bowden extra air, perfect mechanical order; £55; owner bought 1916.—Haddon, North St., York. [X3279]

### Alldays.

**COLMORE** Depot, 31, Colmore Row, Birmingham, can supply immediately all models of Alldays Allon. [X6556]

**ALLDAYS** Allon, all models; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [X7063]

**LAME'S**, 151, High St., Walthamstow, and 50, High Rd., Wood Green, stock all Allon models; special deterred payments. [X3583]

**ALLDAYS** Matchless, 3½-h.p., 2 speeds, F.E., excellent condition; trial; £30.—Blackshaw, 38, Sherborn St., Gorton, Manchester. [X3364]

**ALLON**, 2-stroke, 2-speed, hand operated clutch; client cannot take delivery; for immediate cash £38.—McNaught and Co., Ltd., Worcester. [X6687]

**8** h.p. Alldays Car, 2-seater, dual ignition, hood, lamps, wind screen, and Stepney; bargain, £28.—Taylor, 11, Caversham Rd., West Green Rd., Harringay, N. [X3514]

**ALLON**, 1915½, 2½-h.p., 2-speed, lamps, horn, 2 spare piston rings (unused), spare belt, Dunlops; £35, near offer; appointment.—109, Vicarage Rd., Leyton. [X6626]

**ALLDAYS**, 10-h.p., 2-seater, extra seat for 2, Stepney, speedometer, etc., good condition; £55, or exchange combination.—Nutt, Hill View, Greenway, Tottenham. [X6653]

**ALLON**.—Special easy payments for these wonderful lightweight, immediate delivery.—Colmore Depot, London Agency, 44, Finsbury Payment. City, 121, High Rd., Kilburn. [X3506]

**1915** Allon, 2-speed, and clutch, with 1916 back brake, guaranteed new condition throughout, complete with lamps, horn, and spares; £35/10.—Powell, 107, Archer's Rd., Eastleigh, Hants. [X6723]

**ALLON**, 2-stroke, 2-speed, clutch model, supplied new in December, 1915, very little used; 34 gns., very great bargain.—Julians, Broad St., Reading. Biggest motor cycle and light car dealers in the South. 45 years' reputation. 'Phone: 1024. [X4813]

### Ariel.

**1916** 5-h.p. Ariel Combination, fitted h.b. clutch, for immediate delivery.—Dan Guy, Weymouth. [X3435]

**ARIEL**, T.T., 1913, 3½-h.p., 3-speed gear, clutch, new tyres; £25.—68, Bellingham Rd., Catford, S.E. [X6579]

**1913** Ariel, 3½-h.p., variable pulley, first-rate condition; £22, or nearest.—A. J. Waldron, Ammanford, Carmarthenshire. [X6599]

## MOTOR CYCLES FOR SALE.

## Ariel.

**ARIEL**, 3½ h.p., 1911-12, Grado-multi gear, free engine, splendid order throughout; £17/10.—Speechley, 45, Church Rd., Acton. [3543]

**COLMORE** Depot, 31, Colmore Row, Birmingham, have in stock for immediate delivery all models of Ariel motor cycles, with or without sidecars. [X6557]

**ARIEL**, 1916, all models in stock; ladies taught free by lady tutor; write for deferred payments terms; Ariel's special agent.—Jones Garage, Broadway, Muswell Hill. Phone: Hornsey 2562. [3562]

**ARIEL**, 5-h.p., 3-speed, chain-belt drive, special engine, 4-point Empress sidecar, winner I.O.W. services hill-climb, spare racing sprocket and bars, perfect order; £72.—Lt. Ellis, Cliffrids Fort, North Shields. [X6502]

## A.S.L.

**A.S.L.** Motor Cycle and wicker sidecar, 3 new tyres, Precision engine, excellent condition; £35 cash.—View, Iadmors, King St., Hereford. [X6663]

## Auto-Wheels.

**UTO-WHEEL** for sale, £10; approval on deposit system.—Guildford House, Shaftesbury. [3280]

**UTO-WHEEL**, 1914, running order, shock absorbers £6/10.—Ellis, Bepton, Midhurst. [3480]

**UTO-WHEEL** de Luxe; £15/15, 26/3 monthly.—Seen at Juno Showrooms, 248, Bishopsgate, London. [3553]

## Bat.

**BAT-J.A.P.**, 6-h.p., sidecar; bargain, £30; owner enlisted.—Nelson, Tailor, Sheshp. [X6554]

**BAT-J.A.P.**, 1913-14 Combination, 6-h.p., Bosch (countershaft), 2 speeds, chain drive; £36/10-1, Ebner St., Wandsworth. [X6665]

**1913** (late) 6-h.p. Bat-Jap, coachbuilt sidecar, little used; officer going abroad; £29.—Phel's, 105/11, Provisional Batt., Wimbledon Common. [3303]

**BAT-J.A.P.**, 1912, 8-h.p., Mabon clutch, splendid condition, smart appearance, reliable, speedy mount; £24; attested.—Pearce, Church St., Gt. Missenden. [3309]

**BAT-J.A.P.**, 8-h.p., nearly new, clutch, 2 speeds, kick starter, all chain-driven, tyres hardly used; only wants seeing; bargain. £45.—Seen, 47, Kennington Oval, S.E. [3519]

**6-h.p. Bat**, 1914 model; twin J.A.P. engine, 3-speed gear and free engine, includes all accessories, Lucas lamp, horn, and speedometer; £55, guaranteed.—Wauchope's, 9, Shoe Lane, London. [X6695]

**BAT-J.A.P.**, 1915, 6-h.p. combination, luxurious sidecar, Lucas accessories; cost all on well over £100; has been carefully handled; owner bought car; sacrifice £82.—Whitehouse, Engineer, Greatbridge. [X6555]

**BAT**, 5-h.p., late 1915 model, countershaft 3-speed gear box, spring frame, J.A.P. engine, lamp, horn, spares; cost £80; all as new, only done 250 miles; bargain.—Baxter, Warantab, Lower Walton, Warrington. [X6655]

## Brown.

**3½ h.p. Brown**, good going order, fast mount; £6, no offers.—Barber, 440, Fore St., Edmonton. [X6548]

**BROWN** 3½ h.p. and Sidecar, 2-speed N.S.U. gear, in very good order; £25; easy payments if desired.—Jones Garage, Broadway, Muswell Hill. [3563]

## Bradbury.

**BRADBURY**, 4-h.p., very good condition, hub, free engine, all accessories; £22.—W. Cox, Imperial Rd., Beeston, Notts. [X6746]

**BRADBURY**, 1913, 4-h.p., and sidecar, 3 speeds and clutch, thoroughly sound; £28.—P. J. Evans, John Bright St., Birmingham. [3462]

**1912** 4-h.p. 2-speed Bradbury and coachbuilt sidecar, complete with lamps, horn, and speedometer; £32.—Wilkin, Hunter's Bar, Sheffield. [3246]

**1915** 4-h.p. Bradbury, countershaft, Dunlops as new, coachbuilt sidecar, fully equipped; any trial, perfect; £55; take lightweight.—A. Coffin, Holwell, Sherborne. [X6729]

**BRADBURY**, 1913, 4-h.p., 2-speed countershaft, clutch, kick starter, accessories, Bradbury 1914 underslung 17 in. sidecar, screen, etc.; £27.—Newbatt, 28, Edith Rd., Sellhurst, S.E. [3294]

**BRADBURY**, 1912, 3½ h.p., 2-speed, Whittle belt, 3-jet Binks carburettor, low sidecar, good tyres, lamps, etc., overhauled September; nearest £26.—Blennkarn, 14, Dorothy Rd., Lavender Hill, S.W. [3418]

## B.S.A.

**COLMORE** Depot, 261, Denngate, Manchester, for immediate delivery of B.S.A. [X6558]

**JULIANS**, Broad St., Reading. Phone: 1024.—Immediate delivery of all B.S.A. models. [X2834]

**B.S.A.**, 1916, 3-speed countershaft models, in stock for immediate delivery.—Butler, Baldock. [3310]

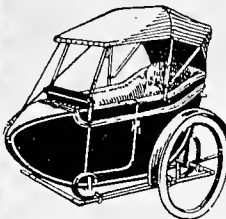
**LATE** 1914 B.S.A., 3½ h.p., splendid condition, lamp, horn; £42.—Edge, Timber, Craven Arms. [3236]

**1916** New B.S.A., model H, 3-speed, chain drive; £64.—Rutherford, 53, Northgate, Wakefield. [X6642]

**B.S.A.**, 1916 models, in stock, model H £64; B.S.A. No. 2 sidecar, £18/18.—Hucklebridge, 133, Sloane St., London, S.W. [X6093]

## CORONET Sidecar Chassis

Is designed for long life, and has a wonderful reserve of stability, and is safe on greasy roads. Luggage carrier built into frame. Cannot shake loose, and is a boon when touring.



£10 15s.

Send for Illustrated Catalogue describing these well-known Sidecars.

EXCHANGES.

TRADE SUPPLIED

We can give immediate delivery of all models, and suitable for any make of machine.

## Coronet Sidecars for Harley-Davidsons.

We make a special Sidecar, enamelled French grey to match, 28 x 3 in. tyre, apron to cover entire body, and four-point attachment ..... £13 10 Immediate Delivery.

## 7-9 h.p. HARLEY-DAVIDSON.

**11J**, electrically equipped, 3 speeds ..... £76 13  
**11F**, standard 3-speed model ..... £68 5  
Cash Offers Wanted.

## CASH OFFERS WANTED.

**4½ h.p. STAR**, big single, brand new 3-sp., chain drive, kick starter; listed £68 5s. £55 0  
**7-9 h.p. HARLEY-DAVIDSON**, 3-sp., with coach Sidecar to match ..... £75 0  
**6 h.p. A.J.S.**, 1915, lamps, horn, speedometer, Sidecar with screen ..... £78 0  
**2½ h.p. PREMIER** Lightweight, 1913, 3-sp. model ..... £18 15  
**2½ h.p. WOLF**, 1916, 2-stroke, 2-speed ..... £33 10  
**6 h.p. REX** De Luxe, 1913 2-speed model, with 16 Sidecar ..... £35 15  
**3½ h.p. HUMBER**, 1914, 3-speed model, with Sidecar ..... £39 15  
**3½ h.p. LINCOLN-ELK**, 1912 model ..... £15 15  
**1913 HUMBERETTE** Cycle Car, hood, screen, electric lamps, 3 speeds and reverse, good tyres ..... £55 0  
**3½ h.p. RUDGE**, 1912, free-engine model ..... £19 15  
**3½ h.p. P. & M.**, 1909, 2-speed, chain drive with sidecar ..... £19 15  
**3½ h.p. SINGER**, 1912, 3-speed model, with cane Sidecar ..... £25 0  
**3 h.p. HUMBER** Tricar ..... £5 5  
**1½ h.p. WOLF**, 1912, magneto ..... £9 10  
**3½ h.p. TRIUMPH**, 1911, 2-speed model, with sidecar, lamps, and horn ..... £23 15  
**6½ h.p. DE DION** Light 2-seater Car ..... £15 15  
**1915 MORGAN**, 700×80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. .... £89 0  
**3½ h.p. HUMBER**, 1911, 2-speed ..... £17 15  
**2½ h.p. CLYDE**, M.O.V. .... £4 15  
**3½ h.p. PREMIER**, 1911, B.S.A. 2-speed ..... £19 15  
**1915 TRUMBULL** Light Car, hood, screen, detachable wheels, speedometer, electric horn, and lamps ..... £89 15

## MISCELLANEOUS.

**New Complete Sidecar Chassis** ..... £ 2 9 6  
**New Coach-built Body**; side door ..... £ 2 7 6  
**New 5½ weatherproof Magneto**, single ..... £ 3 10 0  
**New 2½ Glare Brass Electric Tail Lamp** ..... £ 4 11  
**1916 Binks Carburettors**. Your old carburettor taken in exchange.  
**14 Coach Sidecar**, Screen, Apron ..... £ 7 15 0  
**Complete Sidecar** with wicker body ..... £ 11 0 0  
**Speedwell Sidecar Chassis**, with 2½ in. tyre ..... £ 2 19 6  
**Cane Sidecar Body**, enclosed type ..... £ 10 6  
**New 4 in. Mudguard Blades**, enamelled ..... £ 2 3  
**New 2½ h.p. Petrol Stationary Engine**, mag., 2 flywheels; listed £22 10s. £15 15 0  
**New Complete Sidecar Wheels** ..... £ 4 8  
**Cane Sidecar**, enclosed body ..... £ 3 15 0  
**New Projectile Cane Sidecar** ..... £ 8 5 0

BOOTH'S MOTORIES,  
PORTLAND PLACE, SKIRCOAT ROAD,  
HALIFAX.

'Phone: 1062.

Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## B.S.A.

**LAMB'S**, 151, High St., Walthamstow, and 50, High Rd., Wood Green, stock all B.S.A. models; special deferred payments. [3578]

**LATE** 1912 B.S.A., in excellent condition, N.S.U. 2-speed gear, with Chater-Lea wicker sidecar; £29.—Chas. Holt, Yarm, Yorks. [X6714]

**B.S.A.** 4½ h.p. 1915 3-speed chain drive combination, complete, spares; £58.—P. J. Evans, 87, John Bright St., Birmingham. [3463]

**B.S.A.**, 1915½, 4½ h.p., model K, with coachbuilt sidecar, lamps, and accessories, equal to new; £65, or offer.—Hancox, The Orchard, Belper. [X6595]

**B.S.A.**, 1915, 4½ h.p., chain-cum-belt, 3-speed, complete; worth £50 easily, accept £45, bargain, cash only.—Layton's Garage, Bicester, Oxon. [X6710]

**B.S.A.**, 1916, model K, mileage 300, enamel, tyre-unspratched, speedometer, Lucas lamp, horn. £58.—Mason, North St., Bishop's Stortford. [3446]

**B.S.A.**, 1916, 4½ h.p., model K, chain-cum-belt, 3-speed, kick starter; £62; exchange or deferred payments.—Eagles and Co., High St., Acton, London. [X6671]

**B.S.A.**, 1915, 4½ h.p., 3-speed countershaft gear, chain drive, in splendid order; £48.—Elice and Co., B.S.A. Agents, 15-16, Bishopsgate Av., Camomile St., E.C. [X6480]

**B.S.A.**, 1916, 4½ h.p., countershaft, chain-cum-belt models; we can deliver from stock at £62 cash, or deferred payments.—Layton's Garage, Bicester, Oxon. [X6709]

**B.S.A.**, model H, 4½ h.p.; cash £64, or with No. 1 sidecar £80 combination; deferred payment terms if required.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [3514]

**B.S.A.**—Easy terms arranged and immediate delivery from stock, no waiting.—Colmore Depot, London Agency, City, 44, Finsbury Pavement, Kilburn, 121, High Rd. [3504]

**1915** 4½ h.p. B.S.A., 3-speed, Dunlops as new, fully equipped, guaranteed perfect, with or without coach sidecar; lightweight wanted; offers.—A. Coffin, Holwell, Sherborne. [X6726]

**B.S.A.**, 1915, 4½ h.p., chain-cum-belt, 3-speed combination, splendid condition, little used, tyres unpunctured; what offers? Wanted, Enfield combination.—Holland, Midland Rd., Bedford. [X6574]

**1914 B.S.A.**, 4½ h.p., chain model, 3-speed, B.S.A. No. 2 sidecar, King of the Road 3 gn. lamp, etc., tools, etc., new tyres, 1 steel-studded; will sacrifice £50 for cash; will climb a mountain.—Apply, 19, M. Brittain, Ashfield, Pontardulais, S. Wales. [X6493]

## Calthorpes.

**CALTHORPE-PRECISION**, 2-speed, unused; £25.—Oracle Motors, 356, Gray's Inn Rd., W.C. [X6573]

**2½ h.p. Calthorpe-Jap**, 1915 model, 2-speed gear; £27/10; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X6692]

**CALTHORPE-J.A.P.**, 1915½, 2½ h.p., 2-speed, lamps, fast, perfect; 26 gns.—22, Comeragh Rd., West Kensington. [3490]

**CALTHORPE**—Latest 1916 2-speed models in stock; cash or exchange; no waiting.—Eagles and Co., High St., Acton, London. [X6670]

**LAMB'S**, 151, High St., Walthamstow, and 50, High Rd., Wood Green, stock all Calthorpe models; special deferred payments. [3581]

**CALTHORPE** Lightweight, brand new, with special mag., 2½ h.p., 2-stroke; £28/16.—Seen at Juno Showrooms, 248, Bishopsgate, London. [3354]

**COLMORE** Depot, 31, Colmore Row, Birmingham, have in stock all models of Calthorpes for immediate delivery; also at our Manchester Depot. [X6559]

**CALTHORPE**, 2-stroke, 2-speed, quite new, but slightly shop-soiled; special bargain, £25.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [3298]

**CALTHORPE-J.A.P.**, 1915, 2½ h.p., 2-speed, good condition, little used, complete with 2 lamps and horn; £27/10.—Holroyd, Simmons St., Blackburn. [X6750]

**LATE** 1915 Calthorpe-Jap, 2-speed, clutch, perfect condition, owner enlisted; nearest offer £25; write for appointment.—Kent, 110, Greencroft Gardens, Hampstead. [3254]

**CALTHORPE**, 2½ h.p. J.A.P., with Enfield 2-speed gear, brand new, shop-soiled only; list £36/15, accept £35.—P. J. Evans, John Bright St., Birmingham. [3451]

**CALTHORPE-J.A.P.**, 2½ h.p., Enfield 2-speed, quite new, but slightly shop-soiled; special bargain, £29/15.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [3297]

**CALTHORPE** Motor Cycles, 1916 models.—Just arrived; 2-stroke 2-speed 31 gns. J.A.P. 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [X6777]

**CALTHORPE**—Special easy payments for these wonderful lightweights; immediate delivery.—Colmore Depots, London Agency, 44, Finsbury Pavement, City, 121, High Rd., Kilburn. [3507]

**CALTHORPE-J.A.P.**, 1916, latest 2-speed models in stock, 36 gns.; lady's 2-stroke, 2-speed, 34 gns.; extended terms quoted.—Elice and Co., City Agents, 15-16, Bishopsgate Av., Camomile St., E.C. [X6552]

## MOTOR CYCLES FOR SALE.

## Calthorpe.

**CALTHORPE**, late 1915, brand new 2-stroke, reduced price £26; also 2-stroke, 2-speed, variable ignition, reduced price £31; 1916 J.A.P. 2-speed, £37/16; all in stock; easy payments 2% only extra.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [3317]

## Campion.

**1915** 4 1/2 h.p. Campion-Precision, 4-speed, sidecar, Lucas fittings, spares, done 2,000; cost £89, £65, offers.—Walker, Junr., 37, Briggate, Leeds. [X6677]

## C.B.

**5-6 h.p.** C.B. Combination; £95, Sept., 1915, perfect condition, 3-speed, kick starter, all accessories; £63.—Stevens, Borrowall Lane, Kenilworth. [X6640]

## Centaur.

**CENTAUR**, 3 1/2 h.p. model, mag. ignition, good running order; £12/10, guaranteed.—Wauchope's, 9, Shoe Lane, London. [X6696]

## Chater-Lea.

**CHATER-LEA**, 3 1/2 h.p. twin, 3-speed, clutch, kick start, double action forks, excellent condition; absolute bargain, £27, offers.—Graham, 27, Wandale Rd., Upper Tooting. [3510]

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**FOR SALE**, 4 1/2 h.p. Chater-Lea-Jap, in perfect condition, brand new Lyso belt, tyres, tubes, front brake, lamps, generator, 1916 B. and B. carburettor, free engine pulley, gradual gear, T.T. bars, very fast, had little use; any severe trial run given; £35.—Pollard, 353, Church Rd., Leyton, Essex. [3259]

## Chater-Peugeot.

**1913** T.T. Chater-Peugeot, 5 1/2 h.p. twin, Mabon clutch, Bosch; £23.—16, Haverstock Hill, Chalk Farm. [3437]

## Clyno.

**1915** Clyno, 2 1/2 h.p., 2-stroke, countershaft 2-speed, clutch, hardly ridden, brand new condition, unscratched; £26/10.—5, Forester St., Canal Rd., Milend Rd., E. [3492]

**CLYNO**, 1915, 6 h.p., 3-speed, kick starter, interchangeable wheels and spare wheel, coachbuilt sidecar, lamps, etc.; £65, or lower power and cash.—29, St. Leonards St., Bow, E. [3477]

## Connaught.

**CONNAUGHT** 2-stroke, 2-speed, 2 1/2 h.p., T.T. lamps, etc., practically new; £25.—11, Luna Rd., Thornton Heath Station. [3487]

**CONNAUGHTS** in stock for immediate delivery, minature, standard, and 2-speed models; prices from £28/7.—P. J. Evans, John Bright St., Birmingham. [3452]

**CONNAUGHT**, 2 1/2 h.p., standard automatic lubrication, footboards, excellent order and tyres, all accessories; bargain, £18.—Lewis, 78, Gladstone Rd., Watford. [3225]

## Coventry Eagle.

**£25.—1915 1/2** Coventry Eagle, 2 1/2 h.p., 2-stroke, only done 400 miles, perfect, as new.—16, Mayfield Av., Chiswick, London, W. [3518]

**COVENTRY** Eagle, 1915, 2 1/2 h.p., 2-stroke, ridden 1,500 miles, perfect condition; £25.—Smith, 116, Barrington Rd., Crouch End, London, N. [X6664]

## Dayton.

**DAYTON** Lightweight, late 1914; cost £24/8; unused owing to war; 19 gns.—Bideford Motor Works, Bideford. [X6726]

## Diamond.

**DIAMOND**, 1915 1/2, 2 1/2 h.p., 2-stroke, P. and H. head lamp, rear light and generator, Lucas horn and spare belt, condition as new; £28.—C. Wolverson, Horseley Fields, Wolverhampton. [X6552]

## Douglas.

**DOUGLAS**, 1914, 2 1/2 h.p., 2-speed; £34, or offer.—14, Montem Rd., Catford. [3411]

**2 1/2 h.p.** T.T. Douglas, 1914, in perfect running order and condition; £35.—Biggs, Eaton, Clepton. [X6245]

**2 1/2 h.p.** Model E. Clutch and 2-speed Gear Douglas; £42/10.—Wauchope's, 9, Shoe Lane, London. [X6697]

**DOUGLAS**, excellent condition; £14, or best offer.—Perry, 23, St. Martin's Rd., Lower Edmonton. [3348]

**1915** 2 1/2 h.p. Douglas, 2-speed, T.T. model; £39/10.—Alexander's, 115, Lothian Rd., Edinburgh. [3560]

**DOUGLAS**, 1914, 2 1/2 h.p., 2-speed, splendid condition; £44; lamps, speedometer, and watch.—Motor Mart, Eastbourne. [3543]

**DOUGLAS**, 3 1/2 h.p., 2-speed, clutch, etc.; £45, bargain.—Perrott, 2, Moss Cottages, Guildford Rd., Farnborough. [3238]

**DOUGLAS**, 1915, 2 1/2 h.p., 2-speed, clutch, kick starter, new lamps, horn, tyre; £45.—D. Millen, Olivers Hydro, Buxton. [X6594]

**DOUGLAS**, 1914, 2-speed, clutch, lamps, etc.; driving taught; £34.—11, Luna Rd., Thornton Heath Station. [3486]

**DOUGLAS**, 1915, 2 1/2 h.p., 3-speed, speedometer, horn, head and tail light, new condition, £52.—Motor Mart, Eastbourne. [3342]

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HENDERSON, 1915, 2-speed, Millford 'Scar	£78
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REX, 1914, 6 h.p., 2 speeds, coach-built	£42
ZENITH, 1915, 8 h.p., clutch, Sidecar	£78
REX, 1913, 6 h.p., 2 speeds, cane Sidecar	£36
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## MOTOR CYCLES FOR SALE.

## Douglas.

**DOUGLAS**—Immediate delivery from stock; easy terms arranged.—Colmore Depot, London Agency, 44, Finsbury Pavent. [3505]

**DOUGLAS**, 2 1/2 h.p., late 1913, 2-speed, clutch, kick starter, all accessories, perfect; £36.—15, Warwick Court, Holborn. [3535]

**DOUGLAS**, 1914, 2 1/2 h.p., T.T. model, fast, complete, and in excellent order; £36.—Layton's Garage, Bicester, Oxon. [X6711]

**1914** Douglas, 2 speeds, T.T. bars, footboards, 2 1/2 in. tyres, specially mudguard, complete; £37/10.—5, High St., Macclesfield. [X6743]

**DOUGLAS**, 1915, immediate delivery any 2 1/2 h.p. model, including War Office black Douglas.—Moffat, Yeovil, Tel.: 50. [3903]

**DOUGLAS**, 2 1/2 h.p., model U, 1914 (Nov.), mileage 1,200, practically new, all accessories; £36.—21, Cavendish Place, Newcastle. [X6247]

**DOUGLAS**, 1912, 2-speed, T.T. model, lamp, tools, all in first-class condition; £27, or nearest offer.—Motorist, 6, Newton Rd., Paversham. [3283]

**DOUGLAS**, 1912, T.T., 2-speed, splendid condition, hardly scratched, P. and H. lamps, horn; £25 cash.—Figg, Castle St., Farnham, Surrey. [3365]

**1913** Douglas, 2 speeds, lamps, all accessories, splendid condition, fast, must sell; accept 26 gns.—T., 17, Rothsay Rd., South Norwood. [3368]

**1913** Douglas, T.T. model, excellent tyres, engine just overhauled, outward condition, good; £32.—Robinson's Garage, Green St., Cambridge. [3471]

**IMMEDIATE** Delivery new Douglas 3-speed, 1915 3-speed, 1914 2-speed, both as new; written guarantees willingly.—Gibb Gough, Gloucester. [3189]

**1915** Douglas, model U, semi-T.T. bars, 2 lamps, speedometer, done 800 miles only, as new; £46/10.—Robinson's Garage, Green St., Cambridge. [3472]

**DOUGLAS**, 1913, 2 1/2 h.p., 2-speed, and clutch, speedometer, lamps, and horn; £32; one ditto, T.T. model, £30.—E. Naldrett, 56, West St., Horsham, Sussex. [3352]

**DOUGLAS**, purchased June, 1914, not been ridden since the end of 1914, owner at Front, excellent condition, electric light; £40.—S. Montgomery, 50, Birch Grove, Acton. [3302]

**COLMORE** Depot, Birmingham, Manchester, Leicester, and Liverpool, have in stock complete range of all models Douglas for immediate delivery, also full range of spares. [X6560]

**DOUGLAS**, 1914, 2 1/2 h.p., 2-speed, perfect order, Millers lamp and generator, speedometer, horn, and all accessories, £39; also Auto-Wheel, £6.—Dudley, 12, Hilldrop Rd., London, N. [3301]

**1910** Douglas, 2 1/2 h.p., T.T.'s overhauled, reliable, good enamel and plate, Lucas lamp set, good tyres, tools; photo, stamp; £19/10.—Singleton, 15, Emore Rd., South Norwood, S.E. [3387]

**1913** Douglas, 2 1/2 h.p., excellent condition, newly overhauled by makers, wonderful power, climb hills 2 passengers; £25 cash.—Apply, D. M. Brittain, Ashfield, Poutardulais, S. Wales. [X6492]

**DOUGLAS**, 1914, 2 1/2 h.p., T.T. 2-speed. Binks, fast, in splendid condition, 2 lamps, mechanical horn; £35; seen by appointment.—Lt., 12, Maresfield Gardens, Hampstead. Tel.: 6779 Hampstead. [3232]

**1914** Douglas, model V, splendid condition, little used, Lucas lamps, horn, Watford speedometer, 3 buttoned tubes, all spares, despatch case; £38; appointment.—39, Earsfield Rd., Wandsworth—Battersea 3072. [3243]

**DOUGLAS**, late 1915, 2 1/2 h.p., 3 speeds, P. and H. lighting set, horn, Stewart speedometer, tools, etc., new belt and new tyres only done 2,000 miles, in perfect condition; £45/10.—Red House, Granville Rd., Sidcup. [3375]

**1913** Douglas, 2-speed, T.T. engine very fast and in perfect condition, enamel and plating very good; 33 gns.—Julian's, Broad St., Reading. Biggest motor cycle and light car dealers in the South. 'Phone: 1024. [X6188]

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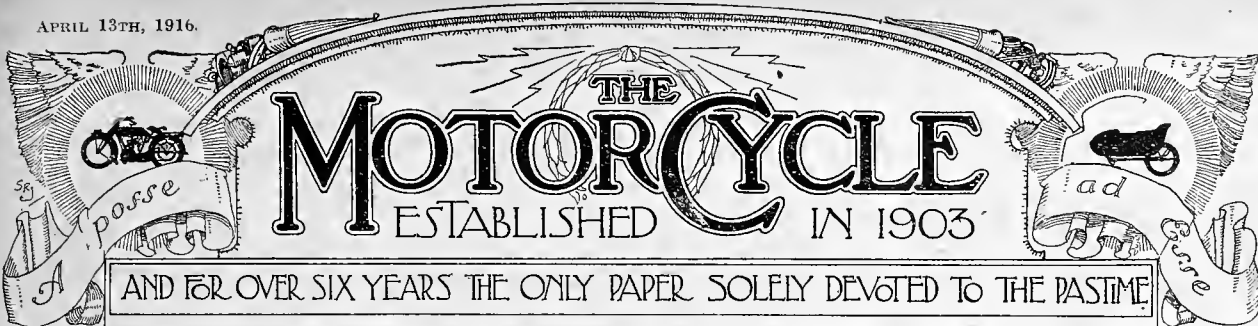
**DOUGLAS**, late 1914, 2 1/2 h.p., kick start and clutch, semi T.T. bars, also touring bars, Bosch, Amac, also all accessories, tools, Lucas lamp set and horn, and Stewart speedometer, condition as new; £47, cheap.—V. Begeruie, 14, Grosvenor Rd., Westcliff-on-Sea, Essex. [2925]

**DOUGLAS** Agents and Specialists. We refrain from mentioning 1916 models, as at present there is no likelihood of obtaining deliveries. We can supply and deliver the latest models brand new at rock bottom prices. Tel.: 368. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [3469]

## Elswick.

**1915** Elswick, 2-stroke, 2-speed; £30.—J. Davis, Royal Military Academy, Woolwich. [3511]

**1913** Elswick-Precision Combination, 3 1/2 h.p., 3-speed, lamp, and spares, good condition and going order; £29.—Dale, 26, Powis St., Woolwich. [X6264]



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## The Taxation of Motor Cycles. Where the Treasury Proposals Fail.

**T**HOUGH a general increase in the taxes on motor vehicles had long been expected in the new Budget, Mr. McKenna's proposals in Parliament last week in respect to motor cycles—examples of which were given in our last issue—created something of a bombshell. Many had been led to suppose that the tax would be doubled, but so far from being doubled, the tax on machines only just over 4 h.p. was trebled, and on the larger machines the Chancellor of the Exchequer proposes that the tax should be nearly five times what it was originally. These suggestions are altogether iniquitous and unjust. Practical men cannot have had a hand in the drawing up of the Budget, or no such impracticable method of calculating the horse-power on the bore only would have been devised. Even wealthy car owners are only called upon to pay double, and sometimes treble, the old tax; so that motor cyclists are threatened with the biggest load, yet they are of a younger class less able to bear the brunt of taxation. A strong fight must be put up to combat such an injustice, or a severe blow will be given to the motor cycle movement. But the Chancellor's proposals are altogether full of anomalies, and last week we lost no time in pointing out these anomalies and laying before the Chancellor a scheme we had formulated, which, whilst bringing in practically the same amount of revenue, is more equitable to motor cyclists in general, as it takes engine capacity into consideration. It had apparently escaped the Treasury's notice that under its proposed scheme quite a large proportion of motor bicycles would be taxed as much as £4 14s. 6d., whereas several makes of small cars would get off with four guineas. On three counts this is proved an absurdity. (1.) The original cost of the vehicle. (2.) The damage respectively caused

to the roads by two and four wheels. (3.) The fact that the small car weighs five times as much as the motor bicycle.

No practical man would ever dream of defining the power of a motor cycle engine by the cylinder bore only. In the case of cars this system of h.p. rating is by no means a success, though it may suffice. But the Treasury rating is an absolute failure when applied to small motor cycle engines. To take a case in point. There are two F.N. four-cylinder machines on the road, both having a bore of 52 mm., but one has a stroke of 57 mm., and the other 88 mm.; the nominal horse-power respectively is 4½ and 7. The last named machine is essentially a side-car mount by reason of its engine size and weight. The tax, however, would be the same in either case, viz., £4 14s. 6d. The other most striking anomaly quoted in our letter to the Chancellor is the case of a single-cylinder machine having a bore of 79 mm., which with sidecar outfit is taxed at the rate of two guineas, whereas a twin-cylinder solo machine only two-thirds the power is mulcted to the extent of three guineas.

It is considered that any new scheme of taxation which reduces the estimated revenue would be rejected, so that the efforts must be confined to placing the new taxes on a fair and square basis. Even lightweights and bicycles with motor attachments have been ignored by the Chancellor. It is to be regretted particularly that no rebate is allowed in the case of old-pattern motor cycles. It is hard lines on the man with a shallow purse, who cannot afford more than a second-hand machine, to be deprived of using that machine on account of the high rate of taxation, and we doubt not that there will be many such cases in view of the pronounced increases. To make matters worse, petrol still has an upward tendency quite apart from the difficulty experienced in obtaining supplies. Truly the lot of the motorist, at the moment, is not of the happiest.



## SOME SPORTING REMINISCENCES :



THERE are no trials to report in war time, so the editor has commissioned me, as the next best thing, to ransack my memory for reminiscences, humorous or pathetic, of bygone competition rides. It is odd how uncomfortable competitions are when you are engaged in them; how unfeignedly you rejoice when you check in at the last stage, whether your medal is won or not; and yet how your memory returns lovingly to those strenuous days and holds them better fun than all the peaceful go-as-you-please jaunts you ever had. On the one hand, the hotels are crowded—you may even be put to sleep on a 4ft. sofa with a carved mahogany

devil projecting from the middle of its back, as once befell me at Beattock, I think it was; the petrol stores are the scene of frenzied hand-to-hand fights, when you steal the one and only funnel from your best friend and scoot off without paying for your fuel because marks are in danger; a constant sense of extreme anxiety broods over your machine day and night, and especially around the tyres; the officials, normally your best friends, become more loathly than any Prussian for the week that the trial lasts; they are men without commonsense or a notion of fair play, and must be cajoled, brow-beaten, or even lied to—till Saturday night. Your dearest pal lies under suspicion of inserting silver sand in your crank case, sulphuric acid in your lubricant, water or paraffin in your petrol tank. On the other hand, there is nothing like trial riding. Looking back on it, you would rather climb Applecross in a snowstorm with an eagle-eyed marshal at every corner and a medal depending on every checked skid and there-and-back corner, than joyride the prettiest flapper in Surbiton down the Portsmouth Road. Still, it is time I deserted generalities and got to my muttons.

### The End-to-end Record.

My earliest memories are of the old M.C.C. hundred-mile non-stops, which usually started from Redbourne. We did about twenty-five miles out

#### READING FROM TOP TO BOTTOM:

In Spean Glen, at the foot of the Grampians, in the A.C.U. 1910 End-to-end.

A notable group, including many well-known riders, at Worcester in 1909. The two men in the foreground are W. Milnes and W. Pratt (P. and M.'s), and in the background from left to right may be seen J. S. Holroyd, R. W. Duke, G. Stevens, Gordon Gibson, J. H. Slaughter, W. H. Wells, R. Moore, and P. Platt.

A Quarterly Trials scene, April, 1909. From left to right, W. Douglas (Douglas), O. C. Godfrey (Rez), F. W. Applebee (Rez), and Eli Clark (Douglas).

At the top of Dinas Mawddwy in the 1909 Six Days. A Motosacoche lightweight is in the foreground, a reminder that lightweights are by no means a new type of machine.

## TRIALS AND RECORDS OF THE PAST RECALLED BY A VETERAN COMPETITION RIDER.

and home, being turned by a marshal on the triangle of turf surrounding a fingerpost; and our main anxieties were whether our steering lock would be small enough for the triangle, and whether our accumulators or platinum contacts would give out first. As very few of us really understood our machines, there were seldom more than a third of the entry left in after the first fifty; though Leonard Jones on a converted De Dion tricycle, and Milligan on a Bradbury once achieved undying fame by performing, I think, eight consecutive hundreds absolutely non-stop, though, of course, there were mighty tunings between Saturday and Saturday. Then I fell in with a manufacturer who had a goodish machine, and wanted a goodish advertisement to make it sell. Casting about for an opening, we noticed that Tom Silver then held the End-to-end record on a direct-belt-driven, accumulator-ignited Quadrant in sixty-four hours odd. Green as we both were, I actually rode my machine up to John-o'-Groat's to go at the record, instead of riding up a spare, and railing up the factory-tuned speed-beast. On reaching Groat's, whom should I find killing time rather lugubriously but F. T. Bidlake, and my hopes sank, to zero when he informed me that he was timing up G. P. Mills, the hero of so many pushed records over the classic course. However, the night passed amidst wind and hail, and there was no sign of Mills. Next morning I rode in to Wick to wire my manager, and suddenly I sighted a yellow figure in oilies bouncing crazily at speed over the litter of mud and rocks which then composed the terminal stretch of the ancient route. Mills had knocked sixteen hours off Silver's figures; and well he deserved his glory, for the rims of his Raleigh resembled the edge of a well-crimped pie-crust, and the soft flesh round his eyes was pounded into a bloody pulp by the night's hail. I revised my schedule, and started next day; but what could one expect of an engine which pared down its cams one millimetre per mile, for want of a rocker between cam and tappet, with a 40 lb. spring on the valves? Still, I remember as if it were yesterday an agonised moment in the cold moonlight when I reached a place where four roads met; I was six hours ahead of Mills's time, there was no direction post; there was no living soul within six miles; and my memory was an utter blank! End-to-end honours were not for me. On the next occasion my frame broke when the prize seemed



### READING FROM TOP TO BOTTOM:

A bunch of sidecars on Saintbury Hill during a 1914 trial of the Sutton Coldfield Club.

H. Gibson (J. H. P. Bradbury and co.) on Kenmore in the 1913 Scottish Six Days.

On Berriedale in the 1913 Scottish Trials.

"Outside assistance" on Kirkstone Pass in the 1914 A.C.U. Six Days Trial.

### Some Sporting Reminiscences.—

won; and on the last ride, some genius served me with a counterfeit lubricant which flashed into smoke when it touched the red hot piston.

### The Early Six Days Trials.

The next layer of memories, half paradise, half purgatory, has to do with the earlier six days trials. Their main terror consisted in the effort to climb test hills on single-gear machines. In most of these events I had no factory behind me; and I had not yet found myself as a tuner. Heavens! How many manifold miles have I not pushed prehistoric single-gear machines on all the best-known hills of British and Scottish roads. Be it understood that in those days it did not particularly matter whether you rode up the hill or walked it, so long as you got to the next control station in time, though, of course, a push lost you the little laudatory reference in *The Motor Cycle* which meant so much then. I wonder I live to tell the tale; my standard experience was, first, as long a pause as I dared make at the hill foot to cool off, see to the belt, tighten compression joints, and change oil; then a wild rush at the hill, terminating in bottled conks about 400 yards up; jump off and run till one's heart was conking too; stop for a breather; cock one's eye for a chance to restart; push up a side lane, or even over the naked heather, charge wildly down on to the road for another rush; final and hopeless peg out with glowing engine 800 yards from the summit; body absolutely done. If in England, kindly friends usually pushed one up; if in Scotland, you received genial condolences from fellow sufferers, and perhaps took it by turns to push each other up. Arrived at the summit, it dawned on you that if you could do, say, thirty miles in forty minutes, you could "save your gold." Down went the nose on the lamp bracket, open slammed the throttle, and a wild blind almost invariably got you to control on time. Anyhow, you usually got your gold medal at the end of the week, and smole when your manufacturer dilated in two-inch capital letter ads. on the marvellous performances of your accursed machine.

### A Double Gold Medal.

As I approach more recent memories, the cup grows sweeter. In 1911, I think it was, I first achieved one of my minor ambitions by winning a gold medal in both the English and Scottish Six Days, and the performance still reads creditably to me, for the machine was a rather raw  $3\frac{1}{2}$  h.p., apt to get unco' hot in sustained running, and equipped with a frictionful two-speed gear affording no lower an emergency ratio than  $6\frac{3}{4}$  to 1. The routes were the Harrogate course, including plenty of real bad hills, and the usual Scottish route. Of the two weeks, the English ride was almost a picnic. Even Sutton Bank caused me no grave anxiety. The main trouble was that the officials got alarmed at the prospective number of gold medals, and became unduly Prussian anent our efforts to tune up at the foot of a test hill. Now my loathsome German gear gave no lower bottom ratio than 6 to 1 on a  $\frac{7}{8}$ in. belt, and I could only get the necessary  $6\frac{3}{4}$  ratio by fitting a  $\frac{3}{4}$ in. belt for each test hill. I dare not run on the small belt, because I had only one of it, and it would never stand the racket of 1,000 miles; moreover, I did not know where most of the

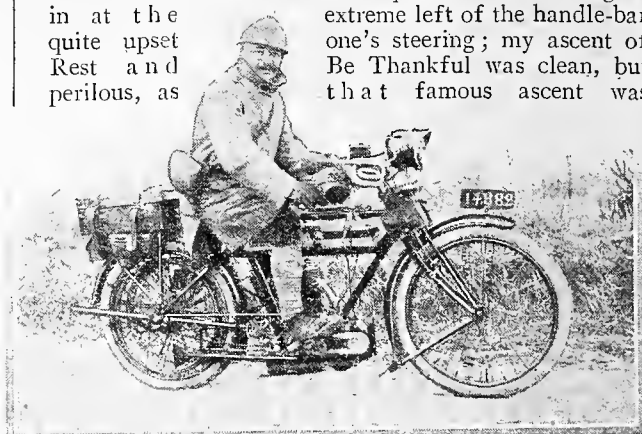
hills were to be expected. However, in the end I managed to dodge the officials sufficiently to get the  $\frac{3}{4}$ in. belt fitted for every hill bar Sutton Bank, and by some miracle my engine took Sutton on the 6 to 1 gear.

### Hoist by his Own Petard.

It is a long step from Yorkshire to Wales, but one Welsh trial provides the most humorous episode of my memory. One of the cutest trial riders in England had pegged out with manifold troubles, which he had unexpectedly cured about half an hour too late. He jogged on with me in a very bad temper at his enforced disqualification, continuing till he should find a station whence he could train to town. He arrived with me at the next control, which was in charge of a small boy, acting as deputy postmaster. It dawned on X that he could bully this urchin into entering him as having arrived at the aforesaid post office about forty-five minutes sooner than he really had. No sooner said than done. Under pressure from X the urchin duly entered X both on the main sheet and on X's card as having reached Lllanydidlios at 10.45 a.m., it being already 11.35 a.m. X accompanied me rejoicing at his narrow escape from retirement under the time rules. X and I potted on together leisurely till we hove in sight of the next control, some ten miles away, where we got out our watches to verify when we were due in. It then dawned on X that he was hoist with his own petard. True, he was duly booked as having reached Lllanydidlios at 10.45 a.m., but on that very booking his maximum time at Aberbluebell, ten miles on, was obviously 11.15 a.m.; whereas, in fact, X had not started from Lllanydidlios until 11.35 a.m.! The cream of the joke was that X had solemnly to retrace his tracks ten miles to Lllanydidlios to catch a train to town, as there was no station at Aberbluebell.

### Hard Luck, and Too High a Gear.

I have almost omitted the Scottish Trials of 1911, tackled on the same machine, which was less kind than in England. The makers of my "bus" had foolishly devised a flexible wire control for the N.S.U. gear, and this control took 2 h.p. to operate, so that in about two miles of low gear work the quadrant broke. The intense muscular effort required to hold low gear in at the extreme left of the handle-bar quite upset one's steering; my ascent of Rest and Be Thankful was clean, but perilous, as that famous ascent was



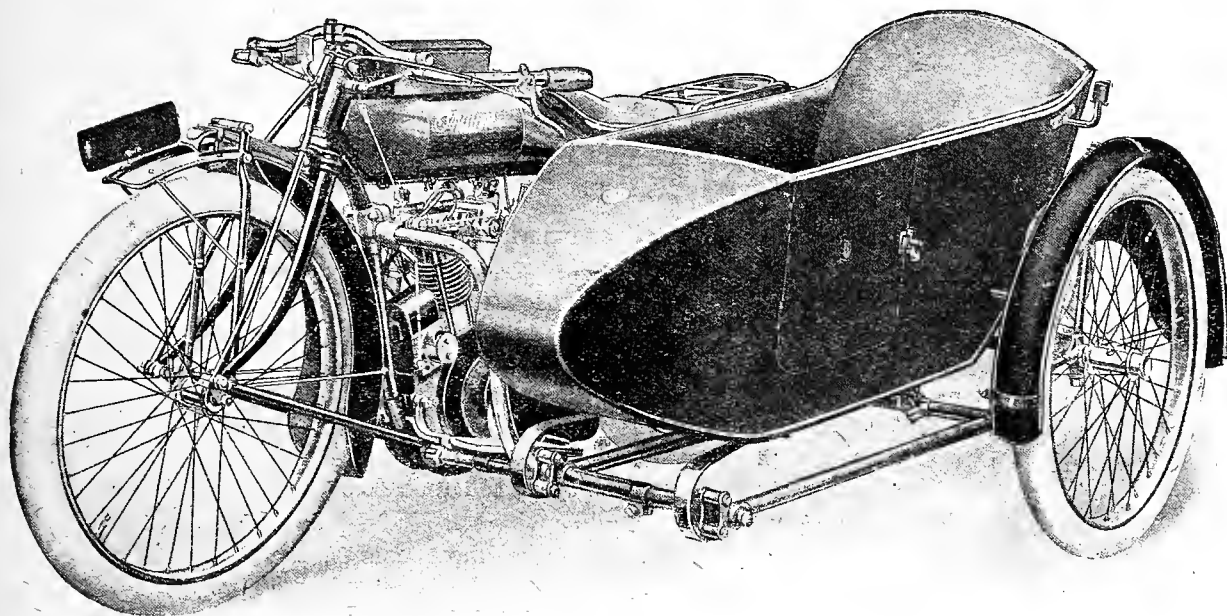
M. Gouvernet, a well-known French motor cyclist, who has been on active service since the very beginning of the war. Our photograph, which shows Gouvernet on his Triumph, was taken early this month, and shows that he looks none the worse for nineteen months as a soldier.

# Cheap Motoring

can best be obtained by investing in an

# Indian

Light Sidecar Combination.



Reliable under every condition  
and economical to run.

**Price Complete**—as illustrated,  
5 h.p. engine (most powerful unit in the market of  
similar c.c.), three-speed gear, and handsome, com-  
fortable, and exceptionally strong coach-built sidecar **£86 : 10s.**



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Telephone: Museum 1643. Telegrams: Hendian, Eus-road, London.  
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AUSTRALIA .. .. 109-113, Russell Street, Melbourne.  
CANADIAN WORKS .. .. 12-14, Mercer Street, Toronto.

*In answering this advertisement it is desirable to mention "The Motor Cycle."*





## Mr. Dunlop heads a deputation.

“— In conclusion, I will summarise my points :

- (1) There is annually a sum of more than £3,500,000 going out of this country in the purchase of foreign-made tyres.
- (2) There is an ample supply of British built tyres to meet all legitimate demands without the importation of a single foreign tyre.
- (3) Foreign tyres, on account of their bulk, occupy an appreciable amount of valuable space and thus accentuate the existing shortage of shipping.

I submit, therefore, that on these three counts, the free import of foreign tyres at the present juncture is economically unsound and contrary to national interests.”

# DUNLOP

## RUBBER COMPANY, LIMITED,

FOUNDERS OF THE PNEUMATIC TYRE INDUSTRY.  
Aston Cross, Birmingham. LONDON—146, Clerkenwell Road, E.C.  
Branches — Coventry, Nottingham, Manchester, Newcastle,  
Bristol, Leeds, Liverpool, Glasgow, Dublin, Belfast.

**Some Sporting Reminiscences.—**

littered with stalled machines, and how I threaded a serpentine course through them I shall never know, for my sensations were that I was seated on the left handle-grip, holding the low gear in with feet, teeth, and arms. Cairn-o'-Mount was a cruel blow. Half-way up my low gear seized, so that I was left with nothing but the  $4\frac{3}{4}$  to 1 top ratio. Even at that I should have climbed it but for a certain rider who shall be nameless. At one of the landings the Scottish road menders had been busy; in other words, they had blocked the entire road with a forty yard strip of stones and rubble a foot deep on a grade of 1 in 12 or so. Two deep ruts offered the sole chance of crossing this awful obstacle without being unsaddled. The left-hand rut was full of fallen men; just behind a very famous rider I took the right-hand rut, and he flopped over and baulked me a yard from clean ground. Needless to say, I never got my engine really going again with a  $4\frac{3}{4}$  gear on single figure gradient, and after a cruel push of nearly a mile I blinded into Aberdeen, with hopeless forebodings of to-morrow's gradients on a single gear. During the evening I visited the local agency, and startled its proprietor with a wild whoop as I spied an N.S.U. gear on a machine in his window; and what is more, it had tank control. When I fell upon it and removed the gear, the worthy man thought I was mad. Next morning the seized wire-operated gear came off my jigger, and on went the new gear and control.

**The Four Brave Men.**

By way of conclusion I will tell you, with apologies to Edgar Wallace, the story of the Four Brave Men. By this time I was getting old, and I no longer rode a two-wheeler as a competitor, but drove a car, with a bottle of the best in the sternsheets, as a full-fledged judge. Entering Inverness one evening I ran the car over a collie dog; as the dog was apparently trying to beat the Marathon record over the surrounding landscape, we judged it was not seriously hurt, and drove on into the garage. Next morning we timed the boys out, and prepared to make a cross-cut which would bring us to the lunch control

well ahead of them. When we were all aboard, I tried to bring the car out of the huge garage by making a wide cast, instead of reversing; but the more I steered to the left, the more obstinately the car went to the right! I just had sufficient sense to declutch, and we all four investigated. A short arm in the steering links had got bent by the collie on the preceding evening, and, when the wheel was put to full lock, this short arm slipped over a dead centre and reversed! The short arm was at best of rather nondescript contour, and there was no similar car in Inverness which could provide a pattern for it. We bent it back on the hit-and-miss principle and eventually got it approximately right. I and my three companions were the Four Brave Men. We did another 1,000 miles on that car without bleaching a hair, including many there-and-back corners overlooking Highland precipices; and it was an American car!

**A RUSE DE GUERRE.**

Special overall worn by French despatch riders when travelling over roads under enemy observation. The coat is painted a mixture of colours, so that the rider of a quiet machine so equipped would not be easily detected. The idea is, of course, not new, as artillery and transport waggons have been painted foliage tints in order to hinder observation by enemy aircraft from the earliest days of the war.

**BACKFIRING IN TWO-STROKE CRANK CASES.**

**N**OBODY has a bigger experience of pre-ignition and back-firing than I possess, for the years 1907-1910 saw some of my longest mileages, and just at that time most engine designers had a temporary mania for ultra-high compressions, and it was no uncommon thing for an engine to pull up dead almost instantaneously when it was burbling uphill at a good pace.

The reason was that the excessive heat generated by the super-compression had rendered some particle of dirt or metal in the combustion chamber sufficiently incandescent to ignite the mixture before the piston was reasonably high on the compression stroke. Sometimes a speck of carbon was the culprit, sometimes a rough edge on the interior casting, sometimes a sparking plug electrode, and in one case the edge of the screw-driver slot in the head of the exhaust valve got red-hot. I had almost forgotten these experiences

until the other day, when my two-stroke thoughtfully revived them by pegging out abruptly, with fearful choking noises in its crank case, repeating its misconduct on every long hill.

I was nonplussed for the moment, but managed to reach home somehow, only to discover that excessive carbonisation was the cause, and the engine regained its best paces after a good clean. A practised friend tells me that similar symptoms may arise with a perfectly clean engine if too small a jet is in use, the fault being equivalent to popping back in the carburetter with a four-stroke engine. Similar pre-ignition might further occur as the result of any form of overheating; I have heard of a case where the magneto timing slipped back a degree or two; the retarded ignition then produced excessive heat, and the spidery electrodes of a multiple-point plug gradually became incandescent.

IXION.

# Tests Extraordinary of War Office Motor Cycles.



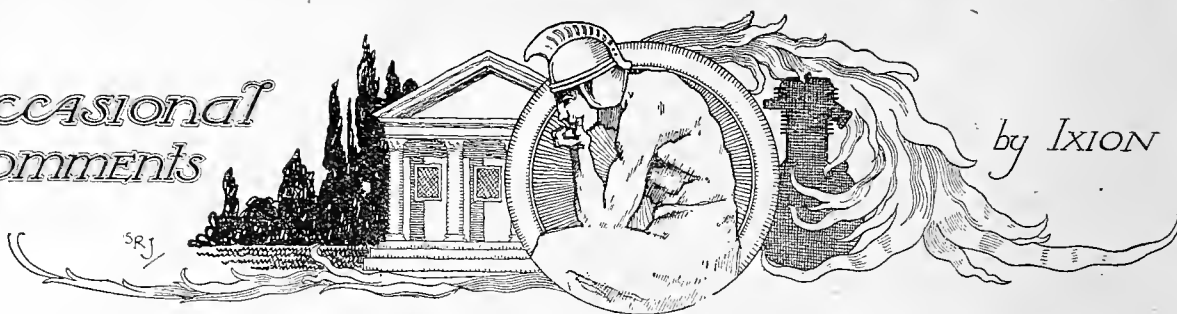
HILL - CLIMBING POWER IN CONJUNCTION WITH



Inset : Letting in the clutch violently.

WEATHERPROOFING QUALITIES ARE ALL IMPORTANT FOR ARMY WORK.



Occasional  
Comments**Conflicting Tales from the D.R.'s.**

Many of us have been a little puzzled by the very conflicting yarns we hear from the Front as to the roadworthiness of our modern motor bicycles under the unparalleled tests of war work in Flanders and France. We have all read glowing testimonials, signed by men who should know how things are; and we have many of us heard less satisfactory stories from isolated individuals here and there, some of whom are seriously perturbed at the alleged failure of the trade and of the War Office to carry out various simple improvements which they assert are urgently needed. I believe the main facts are somewhat as follows. On the whole, our motor cycles have done excellent work under conditions which are wholly unsuited for their employment, and are far more exacting than motor cycles have ever faced before. Uncle Sam doesn't chuck away good dollars, and his motor cycles are not, on the average, equal to our own; but he is exploiting his motor cycle services for all he is worth—*vide* any issue of any American service journal or motor cycling magazine.

**The Fly in the Ointment.**

On the other hand, some of the D.R.'s are not crack riders and mechanics, gallant and devoted though they are, and a few of the lurid tales of trouble one hears must be put down to the man and not to the machine, just as happens over here in times of peace. Over and above this, there appears to be a marked difference between the kinds of service which machines must tackle according to the nature of the rider's job. The despatch riders at General Headquarters and Army Headquarters have a picnic as compared with the men on duty at Divisional and Brigade Headquarters. The nearer the firing line, the more crumpled the road, the worse the mud, and the more violent and continuous the shell fire. Hence it follows that the men nearest the Front are less enthusiastic about their mounts than the men who have less mud, less shell fire, and smoother roads. If your mudguards are inclined to clog with road matter, you will not get very angry if you are on a smooth highway, with only two or three inches of mud, and no nearer reminder of the guns than a distant mutter. But if the road is full of craters, if the mud is a foot deep, if shells are falling every minute, and if your despatch is intended to bring up urgent reinforcements during an attack, a mudguard that is set a thought too close to the wheel will drive you crazy. The plain truth is that our motor cycles are doing excellently under phenomenal conditions, and that it is only when the conditions become literally impossible that they sometimes fail.

**Standardisation at the Front.**

Of the complaints to hand, most have to do with petty details; a chain case lets in mud, mudguards are set too close, the stand is not of the fly-up pattern, the gear change lever sometimes gets jammed with mud, and so on. The very pettiness of these mishaps annoys a man who is doing urgent work at momentary peril of his life, and he wonders—not unnaturally—why the trade and the War Office do not improve matters at once. Let me cite a parallel case. This very morning I received a catalogue from one of those firms which makes a living by selling off discarded Government stuff, nets, ropes, tents, clothing, and the like; much of it is listed as brand new, and most articles are offered at 50% reductions on what we, as taxpayers, originally paid for them. "Gross waste and extravagance," remarks the superficial critic. The plain fact is that a big concern must be run on standardised lines. Suppose a tent is the article in question. The stores clerk reports there are 3,000 tents left in stock, but hardly any poles, or ropes, or bags, or floorboards. An order has to be placed immediately for, say, 25,000 new tents complete. A much improved pattern of tent has been submitted, and the Department desire to adopt it. If they decide on the new pattern, it very possibly entails different ropes, poles, bags, and floorboards. The stock in hand at all Army depots all the world over must settle the question, for you must have supplies and accessories and replacements that will fit the model in use, and you must have them everywhere. What is the value of the goods to be jettisoned throughout the Army, and can you transport the new stock to where you want it? If the sacrifice entailed is small, and if transport is possible, the new model is adopted. If the stocks in hand are huge, if the improvements are trivial, if transport is impracticable at the moment, you must continue to supply the old model. This illustration gives a rough idea of the motor cycling situation. Doubtless the manufacturers could supply a slightly improved machine if they were allowed to; but the War Office cannot accept a variation (a) if it implies scrapping large stocks; (b) if transport is absorbed for more urgent needs; (c) if an immediate reorganisation of the repair and store depots throughout the Army is impossible. No individual rider devoid of experience of organisation on a gigantic scale can comprehend the complications and labour entailed by a comparatively petty alteration in engineering patterns. Nevertheless our deepest sympathy goes out to unfortunate men who, although they have important despatches to deliver, must bend down and scoop accumulated filth out of mudguards under heavy shell fire behind Ypres.

# Hill-hunting Adventures in Lakeland.



Lightweights on Buttermere Hause. The lake of Buttermere is seen in the distance.

By **GEORGE D. ABRAHAM,**

*Author of "Motor Ways in Lakeland," "The Complete Mountaineer," "Mountain Adventures at Home and Abroad," etc.*

"**T**HANK goodness for those rough-riding days in Cumberland!" Thus wrote a young officer who has seen something of the efficiency of the motor cycle as a military aid amidst the wilds of Serbia. On every war front, roadless and otherwise, our despatch riders have distinguished themselves and extinguished the hopes of many a wily enemy move, and when the full story of the war is told the superiority of the British motor cycle and its riders will be revealed as one of the winning factors. Well might the "despatcher" who has defied gravitation on the Serbian heights recall Kipling's lines—

"They sends us along where the roads are,  
But mostly we goes where they ain't.  
We'd climb up the side of a signboard,  
An' trust to the stick o' the paint."

But the stick of Stelastics were more comforting—a fact which was proved in those earlier, more peaceful hill-hunting days when British heights were first climbed by motor cycle enthusiasts. "What's the good of all this?" was a question often heard during those A.C.U. ventures of 1913, when "fearful surfaces" and "fearful gradients" were the order of the day. When Little came down to Wythburn after his strenuous climb up Helvellyn an old daleswoman said,

"Eh, laddie, it's nowt to be proud on; nobbut a fool would clim' a mountain on them things! What guid is 't?" The answer is seen in the modern perfection of the British machine. Excepting with foreign-built machines, there are few complaints nowadays about lack of sufficient clearance between crank cases and the ground.

## Honister Pass.

Yet before the Six Days Trial of 1915 our hill-hunting outings in search of a sporting course resulted in many unexpected adventures because designers had not realised that motor cycles must ultimately be able to go anywhere. One well remembers those first venturesome days when Frank Smith's Clyno started the rough-riding craze by tackling Honister Pass. A private early morning visit to the hill resulted in the crank case hiding itself hopelessly in the shaly gradient of Buttermere Hause, some miles from the real object of the trip. Alterations were made; but when the successful ascent of Honister Pass from the Buttermere side was actually achieved the ploughing crank case added vastly to the thrills of the spectators. The lesson was learnt, and by others also. The Clyno's motor-mountaineering in Lakeland prepared it for the shell-ploughed fields and roads of France.

The sporting side of motor-mountaineering was first revealed to the writer during that earliest attack on Honister Pass. Most machines were then of single gear, and some of the speed rushes at the rugged gradient were thrilling in the extreme. One famous rider, after failing time after time to top the sliding incline of 1 in 3 of Hill Step, at last succeeded. Then, with a shout of delight, he sped, with engine in full cry, up the easier upper slope. He turned joyfully to wave a signal of success as he passed close by us. Suddenly we were dodging the flying machine. Its rider had failed to notice an outstanding boulder in the wretched road surface, and he was flung a dozen yards down the mountain slope. Fortunately, Dame Nature had most thoughtfully supplied a soft cushion of grass for his reception.

A short time ago the question was asked in *The Motor Cycle* regarding the hill-climbing powers of the modern two-stroke lightweight machines, and what was the best ascent by a standard mount of this type. In this connection it is worth noting that early in 1914 a 2½ h.p. Connaught and a small 2¼ h.p. Clyno climbed Honister Pass. Both succeeded at the first attempt, and the former machine was ridden by a novice in rough-riding. Surely this was a unique performance for lightweight monnmts.

### Hill-hunting Adventures in Lakeland.—

A strange and remarkable adventure, due to a low-built engine, happened in connection with the pioneer motor ascent of Helvellyn by Messrs. W. B. Little and R. Drinkall in the autumn of 1913. This climb is one of the standing wonders of the district, and when the drivers of the "four-in-hands" point out the precipitous mountain front and tell their passengers a motor cycle has climbed the "mighty Helvellyn," few do more than class the story with the many doubtful yarns of Lakeland. Yet it is true enough, and true also that Drinkall drove his machine up two-thirds of the fearsome climb without any oil in the engine. It happened thus: A healthy rivalry existed between the two riders—Little on the  $3\frac{1}{2}$  h.p. Premier and Drinkall on the  $4\frac{1}{2}$  h.p. Quadrant—and at one place the latter secured a considerable lead on his companion. To keep this, speed was increased somewhat injudiciously when dashing at a steep pitch in the path. Suddenly machine and rider were lifted into mid-air by the back wheel striking a rolling piece of rock. Spinning in the air, the wheel came down into the gravel, ploughing through it for a firm grip. Unfortunately, a solid bit of Helvellyn projected through the pathway and caught the crank case a shattering blow. A ragged hole was left as big as a five shilling piece, and practically all the oil escaped instantly. Contributions of sticking-plaster and stamp-edging were applied, but the extra oil got away, and Helvellyn received more lubrication than the Quadrant. Despite the two hours' struggle on low gear, with fierce overheating meanwhile, the engine did not seize.

Previous to this expedition, Skiddaw had been climbed, and in the mid-summer of 1914 Sty Head Pass was



The rocky descent of Sty Head Pass to Wastdale. The rider is W. B. Little, now staff-captain in the Durham Light Infantry.

crossed by motor cycle for the first and only time. This was undoubtedly the severest hill-climbing test yet achieved, and one that Little, at any rate, will never repeat. "*J'eni, vidi,*" but the pass conquered must be said by all who have since attempted the outing. Gradients of 1 in  $2\frac{1}{2}$  were common. The rock-stricken Premier, which carried the successful rider over the sliding

scarps of the Sty, shed almost all its fittings excepting those vital to progress. Quite early in the climb, which was taken from the Borrowdale side, the kick-starter and other projections were carried away in the narrow passage of the path between big boulders. On a hidden corner a few days previously a difference of opinion between a Ford car and the Premier had ventilated the latter's petrol tank too effectually. The rough ascent of Sty Head soon showed that the repair had been faultily made. Despite much country soap applied to the gaping joints, petrol escaped quickly, and doubts whether it would last added to the sporting nature of the climb; as none was available within ten miles of the further or westerly side of the Pass, failure seemed a foregone conclusion. However, a keen rider came to the rescue and undertook the sixty mile ride round the mountains to meet Little at Wastdale with a spare tin of petrol. This arrived just as the roughly-handled engine gave its last gasp under the wild crags of Great Gable and within sight of the hotel.

### An Elusive "Aeroplane."

A few months after the outbreak of war the whole of Lakeland was scoured for traces of an enemy aeroplane, which was reputed to have a base and petrol supplies hidden somewhere amongst the mountains. There were innumerable adventures during the fruitless quest, and one of a party of budding despatch riders, mistaking Wastdale for Eskdale, made a brave attempt to climb the westerly side of Sty Head Pass. Supreme difficulties finally convinced the party that the scene of their struggles could not be the Hard Knott and Wrynose route. Darkness put an end to the attempt, and it is doubtful



"Hair-pin bending" on Howtown House. A glimpse of Ullswater is obtainable in the distance.



**Hill-hunting Adventures in Lakeland.—**

whether many of the wanderers reached headquarters before the early morning hours. That very night a scouting party on Scawfell said they heard the elusive aeroplane distinctly. Echoes play strange pranks on the mountains; doubtless the Douglas on the notorious pass was the only strange visitor in the sombre solitudes.

**The Lakeland Roads.**

This Easter time will probably see a large influx of motor cyclists in Lakeland, for after the long and trying winter of war work and worry there are many who must find a holiday on the heights the truest economy both nationally and personally. They will learn that the roads, especially those over the mountain passes, are in better condition than ever before. A visit to Honister Pass and the Buttermere or Ennerdale valleys by way of Derwentwater and through the Vale of Newlands will be found especially practicable. The gradients of Buttermere Hause are now repaired and comparatively firm. The same remark applies to the Devil's Elbow in the Newlands Vale, but perhaps the better surface here accounts for the growing fame for accidents of this sinuous hill. These have usually happened in the descent, and the farmers have tired of repairing the protecting rails at the lower awkward corner. They threaten a thorn and bracken buffer to catch the over-dashing riders who aviate unwillingly at the turn. Not long ago, even during the ascent of the awkward Elbow, a Morgan found the surface tempting to speed work. The driver, with a sporting lady



An awkward corner on a Lakeland mountain road. W. H. Carson, on his British Excelsior, climbing Church Hill, a sporting route from the Vale of Naddle in Northern Lakeland.

passenger aboard, negotiated the lower bend successfully, but the second turn proved a stirring surprise in more ways than one. At eighteen miles an hour the machine refused the turn, and swung across the steep slope and into the wall, finishing in a well-balanced poise partly on the wall with the discarded lady passenger more or less standing on her head on the hill. How-

ever, no serious damage resulted to either riders or machine.

**Ullswater.**

At this early season of the year the writer would especially recommend a visit to Ullswater, the home of Wordsworth's delightful daffodils, and of all Lakeland dales probably the prettiest in springtime. The keen motor cyclist should certainly visit Howtown Hause, on the comparatively unknown eastern side of Ullswater. It is a fascinating hill, and, with its seven curious "hairpins," led to many adventures in the days when single gear machines were in vogue. The writer still has marks to act as reminders of an attempted ascent as passenger on Little's toolbag. Recovery of progress round an upper corner was only possible by taking it at high speed. The turn was misjudged. We left the road and machine suddenly, and found the rocks very hard.

**Visit Lakeland at Easter**

It should be mentioned that the road is not yet made on the east side of Ullswater to allow the full circuit of the lake, but those fond of remoter Lakeland should follow the easterly side as far as possible, and explore Boardale and Martindale on the farther side of the Hause from Howtown. This is the best season of the year to see the herds of wild red deer which haunt the heights above Martindale. The severe weather has dispersed much of their shyness.

The whole Lake District is, in fact, very attractive in the springtime. The weather is likely to be better than at any other time of the year, with the possible exception of September.



A group of R.E. motor cyclist despatch riders who have finished their training and are ready to proceed overseas.



# Then and Now

JUST a summer or two ago, Sonny, [friends,  
Your machine and yourself were "fast"  
But I wonder if you and your Motor  
Imagined what glorious ends  
Your knowledge and riding would lead to—  
What deeds on your mount you would do—  
I doubt if you gave it a thought, lad—  
Your Motor or you!

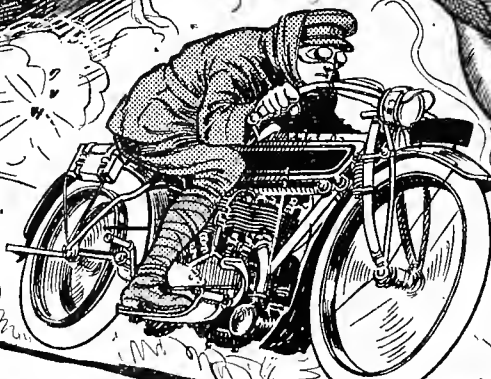
Then, you and your mount were just jolly—  
Some remarked "Jolly nuisance," no doubt,  
As you flew past some portly old stager  
With throttle—well, nearly all out,  
Or may be some fairy-like flapper  
Reposed on the rear of your bike—  
No doubt you oft glance at her letters—  
"Jack, what's D.R. like?"

You will send her a line or two, Sonny,  
Just remarking "It's jolly good fun,"  
But you never will tell of the nerve strain  
Required for each strenuous run.  
You never will tell of the horror  
Encountered—I know that it's true,  
You won't let her hear of the danger,  
No, Sonny, not you.

But history will tell in the future  
Of hardships you splendidly bore;  
It will tell of the trials you suffered  
Day and night in this German-made war.  
She'll read of the deeds you accomplished—  
A hero you'll be when you're back. . . .  
Good luck! and a speedy return, lad—  
Bravo! Stick it, Jack.

1916.

--R. L. NYE.



# WEIGHT and CAPACITY

## A COMPARISON OF WEIGHT IN ITS RELATION TO H.P.

**T**HOUGH practically all classes of motorists find hill-climbing at speed their chief delight, and are never tired of comparing the hill-climbing abilities of their own and acquaintances' vehicles, few stop to consider what really governs speed in hill-climbing. What is this important factor? Nothing but the amount of weight carried for every cubic centimetre of piston stroke. It does not follow that the most efficient vehicle is the one having the highest rating of power to the weight carried, but the vehicle possessing the largest engine capacity to weight is usually the liveliest, nippiest, and fastest on hills.

Now, the power of rapid acceleration possessed by the average motor cycle is far in advance of that which can be attained on any other motor vehicle, with the exception of high-powered racing cars (aeroplanes are outside the considerations of these few notes). The reason of this is, of course, to be found in the fact that the motor cycle has a much larger engine, weight for weight, than a car, a light car, or a cycle car, though in the case of the single-seated three-wheelers the last-named class runs it pretty close. This is, of course, one of the reasons why the Treasury rating, otherwise known as the R.A.C. formula, presses so unfairly on motor cycles.

### The Importance of Gear Ratios.

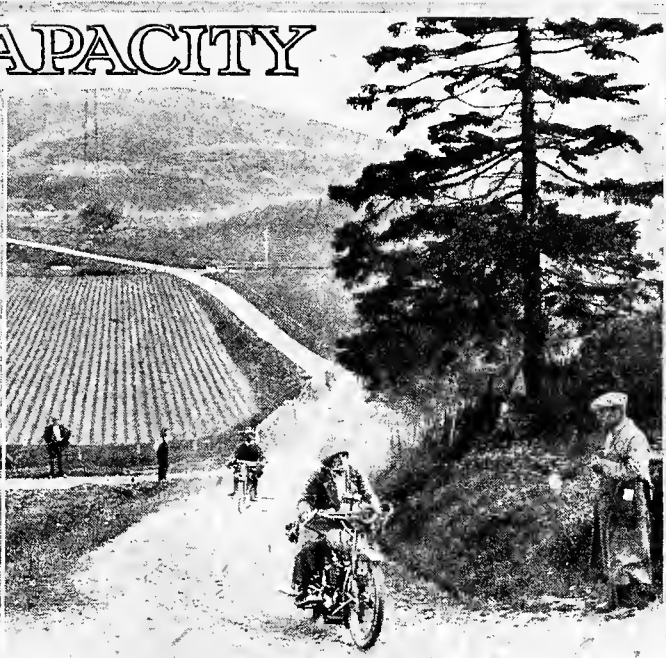
Gear ratios, too, have their bearing upon the case, and, generally speaking, the lower the gear the better will the acceleration be, provided that the speed attained is within the power of the engine; for every engine has its limit in revolutions per minute, beyond which it will not go even when running light. Gears, however, can generally be altered to suit circumstances, and need not be considered at present.

We propose, therefore, to discuss the relationship of weight and cubic capacity as set forth in examples of some of the more usual types. No special machines will be referred to (except in one case), but the weights may be taken as a reasonable average for the type of machine in question, ready for the road and with a moderate amount of fuel in the tank. The rider or passenger is in every case taken to weigh 11 stone.

If, then, we find the number of pounds carried by every cubic centimetre of capacity, we shall have some measure of the power of acceleration and also of the ability to climb hills at speed that the different machines possess.

### Figures that Speak for Themselves.

The following tables give some comparative figures for the various types we have mentioned.



### THE JOY OF THE OPEN ROAD.

A lady rider who appreciates a mount with a reserve of power.

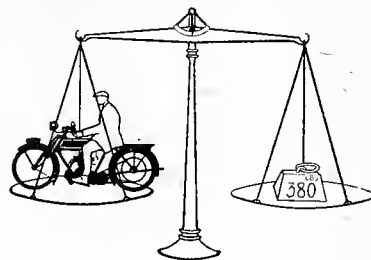
#### SOLO MOTOR CYCLES.

Weight in lb.

h.p.	c.c.	Bicycle	Rider.	Total.	lb. per c.c.
2½	350	176	154	330	.94
3½	500	226	154	380	.76
5	650	256	154	410	.63
7	990	300	154	454	.45

It will be seen that the larger power has a distinct advantage, for the 7 h.p. machine has only to propel half the weight per c.c. that the medium-weight 2½ h.p. machine has.

Of course, if the riders of the lighter bicycles were smaller men than those who ride the heavy-weights, the difference would not be so marked, but



500 c.c. motor bicycle. 380 lb.—  
76 lb. per c.c.

that is by no means always the case. In fact, many a little two-stroke lightweight is expected to carry a rider of 14 stone or so.

#### SIDECAR COMBINATIONS.

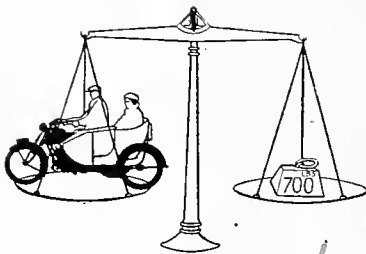
Weight in lb.

h.p.	c.c.	Bicycle.	Sidecar.	Rider.	Passenger.	Total.	lb. per c.c.
6	770	272	120	154	154	700	.91
8	990	350	152	154	154	810	.82

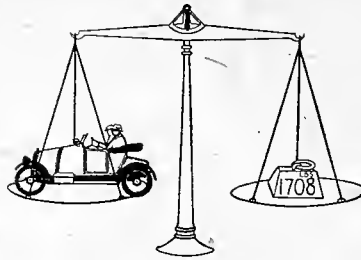
#### CYCLE CARS AND RUNABOUTS.

Weight in lb.

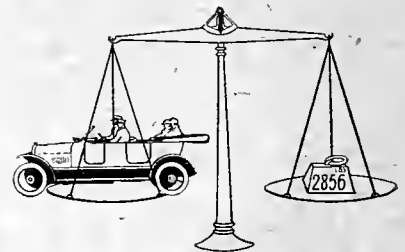
h.p.	c.c.	Car.	Driver.	Passenger.	Total.	lb. per c.c.
8	686	588	154	—	742	.75
10	1100	1400	154	154	1708	1.55



770 c.c. sidecar, 700 lb.—  
·91 lb. per c.c.



1,100 c.c. cycle car, 1,708 lb.—  
1·34 lb. per c.c.



2,300 c.c. four-seated car, 2,856 lb.—  
1·24 lb. per c.c.

In the latter class the 8 h.p. single-seater runabout (a G.P. Morgan) compares very favourably with a solo motor cycle of moderate power, and, as a matter of fact, shows very much the same power of rapid acceleration and ability to climb hills at a fast pace on top gear. The standard cycle car has about double the weight to carry, and naturally will be left behind, though it is capable of a good speed on the level or on moderate inclines.

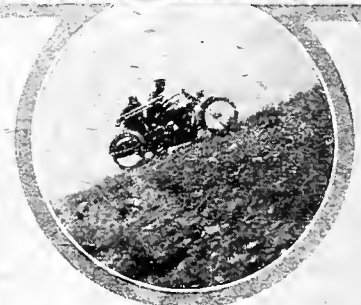
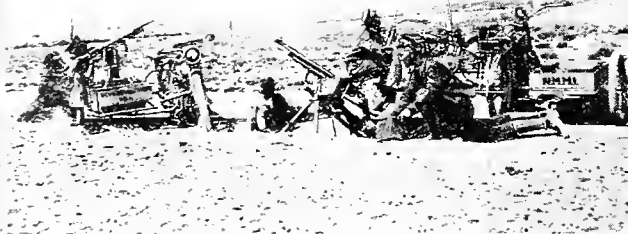
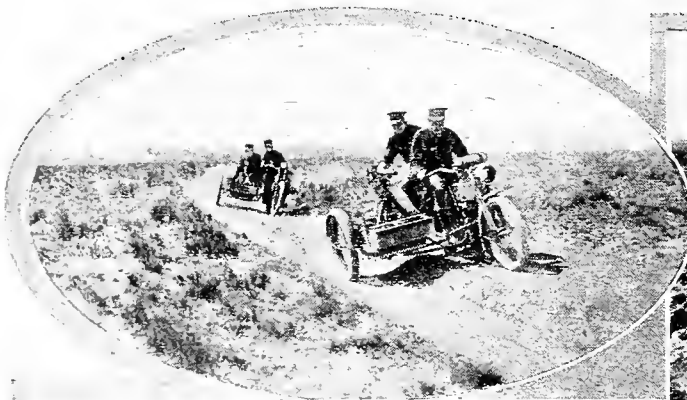
#### MOTOR CARS.

Weight in lb.

h.p.	c.c.	Car.	Driver.	Passengers.	Total.	lb. per c.c.
10-12	1460	1650	154	154	1958	1·34
12-16	2300	2240	154	462	2856	1·24

Reference to the tables will show that none of the motor bicycles alluded to have a load as high as 1 lb. per cubic centimetre, even when a sidecar is attached and two persons carried, while none of the four-wheelers have a smaller load than about  $1\frac{1}{4}$  lb.

### MOTOR MACHINE GUN SIDECARS OF THE UNITED STATES ARMY. HARLEY-DAVIDSON OUTFITS BEING TESTED PRIOR TO BEING SENT TO THE MEXICAN CAMPAIGN



- (1) On a New Mexican cart track.  
(2) Switchback desert tracks.

- (3) Anti-aircraft practice.  
(4) A steep descent and bad surface.

- (5) Outfits at speed  
(6) Gradients have no drawbacks.

# PROPOSED TAXATION OF MOTOR CYCLES.

"The Motor Cycle" and the A.C.U. Suggestions, with Some Examples and Figures.

IT is impossible for a Chancellor of the Exchequer to please everyone, and we do not suppose that he tries to do so, but Mr. McKenna's proposals bear so hardly upon motor cyclists that they must, we think, have been adopted without the assistance or advice of anyone connected with the motor cycle movement. Of course, motor cyclists, like other patriotic citizens, feel that the country needs money, and they are prepared to do their share; therefore some increase in motor cycle taxation was expected, but that proposed has come as something of a shock. The motor cycle was perhaps the most highly taxed vehicle on the road already (certainly the lightweight was) with reference to power, weight, and road-damaging properties. Still a reasonable increase would have been accepted without a murmur.

At present the whole affair is shrouded in mystery. We know that motor cycles up to 4 h.p. are to pay a tax of £2 2s. Why, by the way, is the tax on motor cycles more than doubled, even in the case of the Auto-wheel attachment, when the car tax up to 16 h.p. is simply doubled? Again, why is the motor cycle tax on motor cycles with twin engines, even of low horse-power, increased in a greater ratio than that of the most powerful cars? *In very many cases the new tax is more than 4½ times the old.*

## The Unfairness of the R.A.C. or Treasury Rating.

The tax on motor cycles over 4 h.p. is to be three-quarters that of a car of like h.p., but it has not yet been stated how this dividing line of 4 h.p. is to be arrived at. If by the Treasury rating it will be grossly unfair, for the formula is in no way suited to motor cycles. For instance, a certain light car has an engine of 976 c.c., the bore and stroke being respectively 72 mm. and 120 mm. This is rated at 6.4 h.p. The J.A.P. motor cycle engine of equal size, with a bore and stroke of 85 mm., is rated at 9 h.p., *nearly half as much again*, while the four-cylinder F.N. solo

equitable results. If this is not done, we feel sure that the new taxes will be the means of forcing many owners to give up their machines, and that the reduction in revenue consequent upon this will be very considerable.

## TAXATION BY CAPACITY.

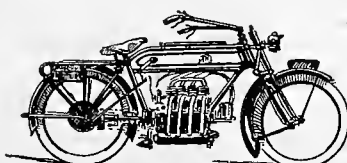
Letter addressed by "The Motor Cycle" to the Chancellor of the Exchequer.

7th April, 1916.

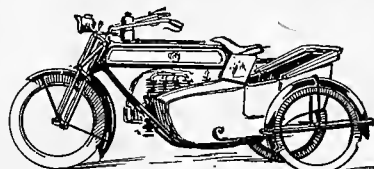
The Right Hon. R. McKenna, M.P.

Sir,—With regard to motor cycle taxation, may I be permitted respectfully to place before you the following important points.

## TAXATION ABSURDITIES.



4½ h.p. four-cyl. F.N. solo £4 14 6



7-8 h.p. four-cyl. F.N. sidecar same figure.

The proposals for the taxation of motor cycles are considered by experienced motor cyclists to be unjust and inequitable, as the following anomalies exist:

1. Quite a large proportion of motor cyclists will be called upon to pay £4 14s. 6d. for their machines, whereas there are several makes of small cars on the market weighing four and five times the amount of a motor bicycle which will get off with £4 4s. The makes of cars referred to are the Perry, Buckingham, and Jowett.

2. The taxation of motor cycles on the bore of the engine only is quite unfair. One example alone will prove this. A certain firm (the F.N. Co.) produces two patterns of four-cylinder motor cycles, both having a bore of 52 mm. One has a stroke of 57 mm., the other 88 mm. The nominal horse-power respectively is 4½ and 7. Under the proposed system of taxation the owner of the more powerful machine (which will easily take a sidecar, whereas the smaller one will not do so) will pay the same as the owner of the low-powered mount.

3. The owner of a single-cylinder motor cycle of 79 mm. bore by 100 mm. stroke—490 cubic centimetres capacity—will be taxed £2 2s. for his machine, which is quite capable of taking a sidecar attachment and second passenger, whereas the owner of a 2½ h.p. twin-cylinder bicycle must pay £3 3s., though the capacity of his engine is but 350 c.c., thus suitable for solo rider only.

## PROPOSALS.

The only fair method of determining the taxation of motor cycles is on the effective capacity of the engine.

I beg to place before you the following simple scheme of taxation, which should not reduce the revenue. I have been led to formulate this scheme with a view to overcoming the objections

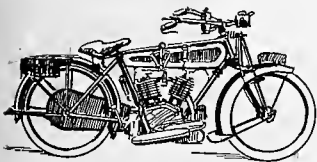
I have outlined above, and which are already causing great discontent among motor cycle users. The scheme, which is based upon the capacity, i.e., power of an engine, is on a sliding scale, and will mean that owners of the more powerful motor cycles will pay proportionately:

Minimum tax to cover all machines up to 500 cubic centimetres capacity ...	£2 2 0
For every 125 c.c. or part of 125 c.c. (this representing roughly 1 h.p.) ...	10 6

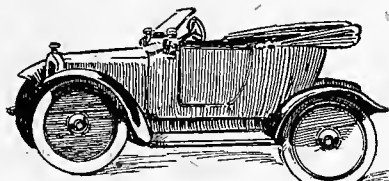
## EXAMPLES.

The maximum sized touring motor cycle has an engine of 1,000 c.c. Thus, the tax would be £4 4s., i.e., not in excess of any car.

## TAXATION ABSURDITIES.



6 h.p. solo bicycle £4 14 6



8 h.p. light car (twin-cyl., 72 mm. bore) £4 4 0

machine with a capacity of 496, not much more than half that of the engines just referred to, is rated at no less than 6.86 h.p., and consequently becomes liable for a higher tax than a car of something like five times its weight.

Other examples, also showing the utter absurdity of the R.A.C. formula when used as a means of comparison between motor cycles and cars, will be found on another page. We trust, therefore, that a more suitable formula will be adopted which will give really



**Proposed Taxation of Motor Cycles.—**

770 c.c. is a popular size of motor cycle intended for side-car work. The tax in this case would be £3 13s. 6d.

I should explain that motor cycles are generally classified by their cubic capacity, so that there is no difficulty whatever in arriving at this. Practically every motor cyclist knows by heart the c.c. of his engine.

I beg to enclose a copy of the last "Buyers' Guide of *The Motor Cycle*," dated November 25th, in which the c.c. of each machine is included as a matter of course.

**ESTIMATED REVENUE ASSUMING THERE ARE 140,000 MOTOR CYCLES.**

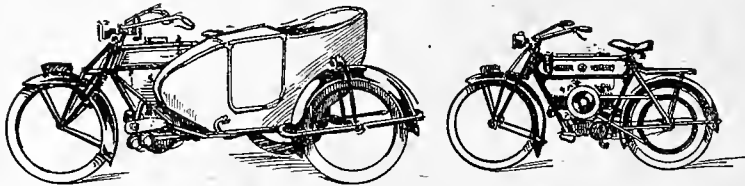
Number of motor cycles not exceeding	500 c.c.	60%	176,400	0	0
" " " " between 500 and 625	625 c.c.	10%	36,750	0	0
" " " " " 625 and 750	750 c.c.	15%	66,150	0	0
" " " " " 750 and 875	875 c.c.	74%	38,587	10	0
" " " " " 875 and 1,000	1,000 c.c.	71%	44,100	0	0
Estimated Revenue .....			£361,987	10	0

I need hardly point out that excessive taxation will result in many motor vehicles being laid aside and unused, particularly in view of the high cost and scarcity of petrol. These remarks particularly apply to the older pattern machine, whose value is low, seeing that no rebate is offered in such cases.

I am, Sir,

Your obedient servant,

THE EDITOR.

**TAXATION ABSURDITIES.**

3½ h.p. sidecar .. £2 2 0

2½ h.p. (1910-1916) solo light weight £3 3 0

**TAXATION BY A.C.U. CLASSES.****The A.C.U. Proposal.**

Sir,—Motor cyclists generally do not, I think, raise any great objection to the proposed increase of taxation as they understand Mr. McKenna's reference to their machines. But it should be pointed out that, whereas motor car owners have, been asked to pay double, and as to large cars treble the former duties, the less wealthy owners of motor cycles have had the duty on their machines increased from at least more than double up to nearly five times as much as that previously paid. This will be a real hardship when it is realised that the Treasury rule as to horse-power rating of motor cycles will be used to determine the power of motor cycle engines, and that however accurate this method of computing horse-power may be for comparatively large engines, it (on account of technical reasons which I need not enter into) very considerably over-rates the power of a motor cycle engine. A few examples will convince anyone having any knowledge of modern motor cycles. The popular lightweight machine, the 2½ h.p. Douglas, would be rated at 4.6 h.p.; the 3½ h.p. single-cylinder Triumph would be rated at 4.48 h.p.; medium power sidecar machines, such as the 5.6 h.p. Clyno or the 6 h.p. Enfield, would be rated at 7.2 h.p.

It is estimated that to-day some 58% of the machines in use are under 4 h.p. as commonly understood, but under the proposed 4 h.p. limit the number would be reduced to 15%, whilst 18% against 7% would be liable to the maximum tax of £4 14s. 6d.

It is believed that in framing these proposals the Chancellor of the Exchequer based his figures on the nominal or makers' horse-power, and that the unfairness of rating motor cycles by a rule applicable to water-cooled car engines has not been brought to his notice.

If it is necessary to grade the taxation on motor cycles according to their power, I suggest that the cubical capacity of the cylinder (or, more exactly, the volume swept out by

the piston) should be the determining factor. Motor cycles have been so classified for competition purposes for many years past, with the result that the cubical capacity of any particular make of machine is generally known, tables giving the capacities of motor cycle engines are readily available, and manufacturers generally have conformed to these rules, so that motor cycle engines automatically fall into a few well defined classes. If a rating rule depending on capacity were adopted, I suggest that the tax should be increased from a minimum of £2 2s. by £1 1s. for every additional 250 c.c., i.e., approximately for every 2 h.p., making the maximum tax £3 3s., which is more than treble the duty previously payable. There are practically no machines of over 1,000 c.c. capacity, i.e., over 8 h.p.

But an even simpler method of taxation, which would be very easy to collect, would be to tax motor cycles at the rate of one guinea a wheel. There are approximately about equal numbers of sidecar and "solo" machines in use to-day. I suggest the former should pay £3 3s. and the latter £2 2s.

I have prepared tables showing the estimated revenue on various bases of taxation, and illustrating the unfairness of adopting the Treasury rating rule for motor cycles.

The figures stated, giving the total number of motor cycles in use to-day and the apportionment of this total number into classes of varying horse-power, are based on information in my possession, which I admit is open to some doubt, though personally I am satisfied as to its approximate accuracy. In any case, the difference between percentages as shown in Tables A and B is so marked as to leave room for considerable inaccuracies without affecting my argument that to rate motor cycles for taxation purposes by the "Treasury" rating rule is most unfair and inequitable. I need hardly add that the Auto Cycle Union is exerting every possible effort to get the new proposals amended.

Yours faithfully,

T. W. LOUGHBOROUGH,

Secretary Auto Cycle Union.

**ESTIMATED TOTAL NUMBER OF MOTOR CYCLES IN USE: 140,000****TABLE A.**

SHOWING ESTIMATED REVENUE ON A RATING BY NOMINAL OR MAKER'S H.P.

Rating.	%	Number.	Tax.	Revenue.
Not exceeding 4 h.p. ....	58	81,200	£2 2 0	£170,520
Over 4 h.p. and not exceeding 6½ h.p. ....	35	49,000	3 3 0	154,350
Over 6½ h.p. ....	7	9,800	4 14 6	46,305
	100	140,000		£371,175

**TABLE B.**

SHOWING ESTIMATED REVENUE ON "TREASURY" RATING AS APPLICABLE TO MOTOR CARS.

Rating.	%	Number.	Tax.	Revenue.
Not exceeding 4 h.p. ....	15	21,000	£2 2 0	£14,100
Over 4 h.p. and not exceeding 6½ h.p. ....	67	93,800	3 3 0	132,300
Over 6½ h.p. ....	18	25,200	4 14 6	295,470
	100	140,000		£458,640

**TABLE C.**

SHOWING ESTIMATED REVENUE ON A "CUBICAL CAPACITY" RATING.

Rating.	%	Number.	Tax.	Revenue.
Not exceeding 500 c.c. ....	53	74,200	£2 2 0	£155,820
Over 500 c.c. and not exceeding 750 c.c. ....	30	42,000	3 3 0	132,300
Over 750 c.c. ....	17	23,800	4 14 6	112,455
	100	140,000		£400,575

NOTE.—If tax on motor cycles of over 750 c.c. were reduced to £4 4s., the revenue from motor cycles of this class would equal £90,960, reducing total to £388,080.

**TABLE D.**

SHOWING ESTIMATED REVENUE ON A BASIS OF £1 1s. PER WHEEL.

Rating.	%	Number.	Tax.	Revenue.
Motor bicycles ....	52	72,800	£2 2 0	£152,880
Motor cycles with sidecars ....	48	67,200	3 3 0	211,680
	100	140,000		£364,560

**Date for Payment of New Taxes.**

Riders who have already paid their taxes are entitled to use their machines until August 15th without further payment. If, however, the machines are used after that date, a supplemental licence for the remainder of the year will be issued on payment of threequarters of the difference due.

A comparative table of taxes under the Treasury and "The Motor Cycle" schemes appears on page 358.

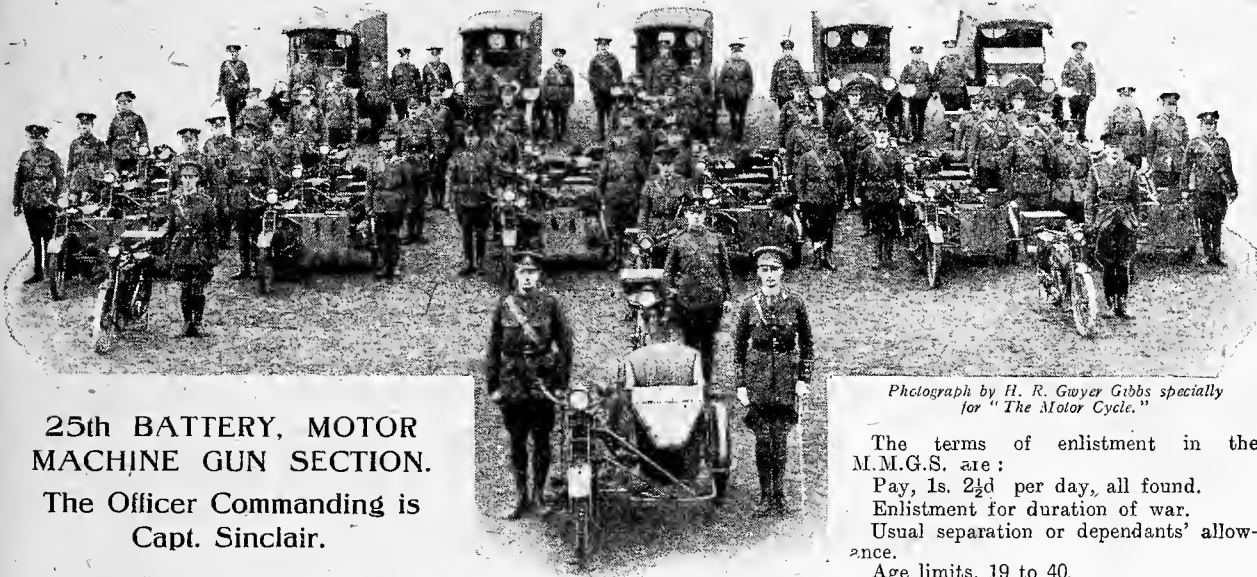
# "THE MOTOR CYCLE" RECRUITING SECTION.

Central Office for Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.



## 25th BATTERY, MOTOR MACHINE GUN SECTION.

The Officer Commanding is  
Capt. Sinclair.

Photograph by H. R. Gwyer Gibbs specially  
for "The Motor Cycle."

The terms of enlistment in the  
M.M.G.S. are:

Pay, 1s. 2½d per day, all found.

Enlistment for duration of war.

Usual separation or dependants' allowance.

Age limits, 19 to 40.

Applications for transfers have been handed over to the M.M.G.S. headquarters for attention. It will save needless correspondence if we repeat that transfers from Territorial Units are not sanctioned by the War Office.

Three inspections of recruits were held by Mr. Geoffrey Smith last week, at Coventry on Tuesday, Nottingham on Wednesday, and London on Saturday. The names of those accepted for service are shown in the list below:

Aggio, C., West Hartlepool.  
Bailey, F., Kettering.  
Barber, R. A., Bromley.  
Barber, W. H., Smethwick.  
Barrett, F., Barnoldswick.  
Barton, A., Mexborough.  
Battini, R., London.  
Beresford, W. H., Walsall.  
Bicknell, S. W., London.  
Blackmore, E., Woking.  
Boul, F. S., Epping.  
Brear, E., Denaby Main.  
Brentnall, A. J., Alkington.  
Burton, O. P. B., Rugby.  
Buttall, H. J., Grays.  
Callahan, R., Hoxton.  
Cattermole, A. H., Ilford.  
Clarke, E., London.  
Clarke, W. L., Barnoldswick.  
Cleary, H. H., London.  
Coles, C. W., Poole.  
Cole, T., Grimsby.  
Cox, F. A., Blandford.  
Crampton, S., Thorne.  
Crowther, P. S., Dewsbury.  
Dircks, A. E., East London (S.A.)  
Dowling, F. R. A., Coventry.  
Elliott, R. G., Coventry.  
Fisher, G. C., Nottingham.  
Franklin, G. S., Cheddar.  
Gardner, B. R. L., Coventry.  
Gilling, H. A., Stapleford.  
Griffiths, C. F., Hereford.  
Hill, H., Finsbury Park.  
Hill, P. J. B., Hull.  
Holland, J., Burton Rossett.  
Ilingsworth, W. L., Dewsbury.  
Ingill, V. H., Birmingham.  
Johnson, W. E., Dewsbury.  
King, R. C., Peckham.  
Kingham, B. H., Birmingham.  
Kirby, W., Asford.

Lawrence, J. B., Northampton.  
Lewis, J. P., Clydach (Glam.)  
Limb, G., Chesterfield.  
Little, G., Hull.  
Lock, W. S., Brixton.  
Londman, N. C., Hove.  
Martin, W. C., Belvedere.  
Matthews, S. G., Herne Hill.  
Miles, A., Coventry.  
Nicholson, F., West Bridgford.  
Nightingale, E. G., Faversham.  
Payne, W. F., Peckham.  
Perkins, W. A., Wellingborough.  
Porter, G., Huncley.  
Prece, F. T., Walsall.  
Preston, A., Beckenham.  
Primmer, A. E., Watthamstow.  
Rule, F. J., Berwick-on-Tweed.  
Simmonds, A. G., Bournemouth.  
Smith, C. R., Coventry.  
Smith, E., Chatteris.  
Sole, D., Chatteris.  
Somerville, G., Piffenry.  
Souden, C., Portsmouth.  
Sponge, C. A., Eastwood.  
Staplehurst, G., Grays.  
Stockdale, E., London.  
Stoner, G. R. R., Eastbourne.  
Swift, J., Linsell.  
Thursby, F., Barnoldswick.  
Townsend, H. P. R., London.  
Treleven, J. H., Llannecon.  
Wells, J., Manchester.  
White, D. N., Kenilworth.  
White, F. A., Nottingham.  
Wilde, J. S., Selston.  
Wilby, G. C. P., Weybridge.  
Witchelow, W., West Ealing.  
Wragg, T. H., Coventry.  
Wright, G. H., Castle Camps.  
Yorston, G. T., Guildford.

A member of the editorial staff of the *Daily Mail* was among the applicants accepted for the M.M.G.S. last week.

A form of application appears on page 358.

THE Editor has received a call for several hundred more recruits for the Motor Machine Gun Service, and will be pleased to consider applications from experienced motor cyclists and car drivers. A form of application is included in this issue, and each question should be answered carefully.

Recruits should note that though their suitability for one or other of the different branches of the Motor Machine Gun Service—sidecars or armoured cars, etc.—will be considered, no guarantee can be given that they will be employed with any particular section, e.g., men may be employed with other forms of motor batteries than the machine gun sidecar batteries, which are well known to readers.

A good number of car drivers have joined of late, specially to be attached to the armoured car sections of the M.M.G.S.

In the latest list of recruits is the name of A. E. Dircks, who came home from East London, S.A., with the intention of joining the Royal Flying Corps, but on applying at the War Office was informed that there was a waiting list of 1,500 names for this branch of the Army. Therefore he was advised to make application to Mr. Geoffrey Smith for a position in the M.M.G.S. (Armoured Car Section). It is interesting to note that Dircks served through the South African rebellion and also through the German South-West African campaign.

### Next Week's Arrangements.

The next inspection will be at the Recruiting Office, Masonic Buildings, Little Park Street, Coventry, on Tuesday next, from 11 a.m. to 4.30 p.m.

On Wednesday, the 19th inst., Mr. Geoffrey Smith will attend at the Victoria Rooms, Clifton, Bristol (opposite the Queen's Hotel), from 2 to 4.30 p.m., for the purpose of testing motor cyclists from the West country. Those who have made application from this district have been notified to attend. Any other motor cyclists or car drivers able to report themselves at the training centre promptly can be seen and passed at the same time.

## CURRENT

## CHAT

TIMES TO LIGHT LAMPS.  
(GREENWICH TIME).

April 13	...	...	7.20 p.m.
" 15	...	...	7.23 "
" 17	...	...	7.27 "
" 19	...	...	7.29 "

## Prices of Second-hands.

A great many people are wondering how the prices of second-hand motor vehicles will be affected by the increased taxes. The fact of foreign made machines being shut out may create a shortage and help to check any sudden drop in second-hand values.

## Importation of Motor Cycle Tyres.

In a Parliamentary answer, Mr. Pretyman says that the value of motor cycle tyres imported into the United Kingdom from all sources during 1913, 1914, and 1915 amounted to £101,000, £40,000, and £125,000 respectively.

## Who Said Petrol?

Petrol importation figures are very interesting these days when difficulty is often experienced in obtaining it for private use, and then only at an exorbitant price. Latest available figures show that a vastly larger quantity of petrol was imported into this country last month than in the previous month. The actual figures for the first three months of this year are:

January, 6,985,276 gallons.  
February, 7,522,377 gallons.  
March, 9,076,622 gallons.

In all three cases duty has been paid on slightly less amounts than the above figures.

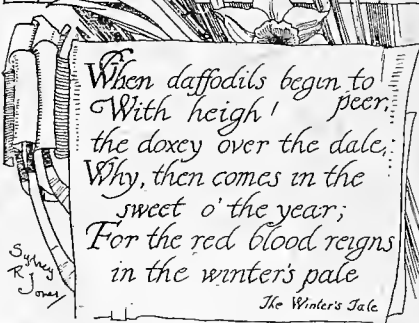
## Imports and Exports.

The Board of Trade returns for March, so far as they concern motor cycles, are remarkable for the big increase in the imports. In dealing with the February figures, it may be remembered that we commented on the favourable signs contained in the decrease of imports and increase of exports. However, such an increase as from 8 complete machines in February to 378 in March cannot by any means be explained as a mere fluctuation. The most probable explanation is that foreign manufacturers, fearing total prohibition of imported touring motor cycles, despatched as many machines as they could to England before the new regulations came into force, i.e., on March 27th.

The export figures show very little change over those for the previous month, and call for no comment.

The actual figures are:

IMPORTS.			
	March, 1916.	Feb., 1916.	March, 1915.
Number .....	378	8	63
Value, complete machines	£4,209	£347	£2,480
Value, tyres and parts ..	£5,152	£6,341	£7,344
EXPORTS.			
	March, 1916.	Feb., 1916.	March, 1915.
Number .....	1,093	1,133	770
Value, complete machines	£49,305	£49,960	£32,636
Value, tyres and parts ..	£7,175	£30,613	£6,359



## Negotiating a Dicker.

Our contemporary and namesake of Chicago has been poking fun at our description of Mr. Arthur Chapple's machine gun trailer, about which he has been "negotiating a dicker" with the Allied Governments. We wish Art. Chap. all success in his haggling stunt, and are grateful to our contemporary for putting us wise on this matter. Doubtless "Boss" Webster included the word in his "unabridged" out of compliment to our American cousins (for we notice he appends the letters U.S. to the entry). Meanwhile we are looking forward with much pleasure to the receipt of the dictionary, which, we understand, is on its way.

## SPECIAL FEATURES.

## ANNUAL SPRING NUMBER.

## SPECIAL ARTICLES AND ILLUSTRATIONS.

## Ten and Sixpence per Horse-power.

The Motor Cycle has written to the Chancellor of the Exchequer urging that engine capacity be considered in the new taxes. If 125 c.c. be regarded as 1 h.p., and 10s. 6d. per h.p. charged, the owner of a 1,000 c.c. machine would pay £4 4s., i.e., not more than a light car owner as at present proposed.

## The Motor Cycle Corps in the German East African Campaign.

We understand that 300 men were recruited for the Union Motor Cycle Corps for General Smuts's campaign against the Germans in East Africa. All the men are mounted on B.S.A. machines. There were many more applicants than vacancies, and several good riders had to be placed on the reserve.

## The Roll of Honour.

It is with sincere regret that we heard of the death of Capt. H. T. Whybrow, of the Motor Machine Gun Section. He died of wounds on his 36th birthday. Capt. Whybrow was well-known in parts of Africa as a big game shooter, and when war broke out he was in Bulawayo, but he at once came home and joined the M.M.G.S.

## The Taxes—The Topic of the Moment.

£800,000 is the increased figure the Chancellor of the Exchequer counts upon as a result of his new motor taxes. The method he proposes to obtain the increase is by no means popular and is indeed distinctly unfair. The A.C.U., as well as The Motor Cycle, were quick to point out the injustices and offer alternative suggestions. One recommendation of the A.C.U. was but a step removed from the scheme laid before the Chancellor by this journal.

## A Spring Number!

The current issue, being a spring number, contains many special articles, among which are the following:

"Some Sporting Reminiscences," by a veteran competition rider. Pages 336-339.

"Hill Hunting in Lakeland," by G. D. Abraham. Pages 343-345.

"Weight and Capacity." Pages 347-348.

"Angling Anecdotes and the Motor Cycle," by H. Mortimer Batten. Pages 362-365.

"Women Motor Cyclists on the Land," by Miss May Walker. Pages 367-368.

The burning subject of the hour—the new taxation proposals—is dealt with in the leading article, and also on pages 349 and 350.

### Australian-made Sparking Plugs.

According to our Sydney contemporary, *The Motor in Australia*, sparking plugs are now being made both in Sydney and Melbourne.

### R.E. Despatch Riders.

Married men only have been added to the waiting lists of the R.E. despatch riders' section of late, and then only men of at least 15,000 miles road experience of motor cycles.

### A Hint to Attested Men.

If you have any particular preference as to the section you desire to join, do not leave it until the last minute. Frequently men wait until they are due to report, and then expect a general choice of regiment, but only in exceptional cases can this be arranged, and recruits are consequently drafted into line regiments.

### U.S.A. Military Motor Cycles.

Pictures in this issue will indicate that the United States military authorities are making use of motor cycles in the campaign against Villa. Besides the fleet of Indian motor cycles with pillion seats and the Harley-Davidson machine gun outfits illustrated this week, the War Department has ordered a dozen machines with pillion seats from the latter firm.

### Comment on Motor Cycle Taxation.

In *The Sunday Times*, Mr. Gerald Biss, since he is no motor cyclist, wisely leaves the subject alone, but his general comment on the situation deserves mention. "It is questionable," he says, "whether the Chancellor of the Exchequer will reap any real financial benefit from the form of taxation he has selected, and whether he will not cause a maximum of locomotory inconvenience for a minimum of productiveness." This, we think, hits the mark exactly. What we concern ourselves with now is to get the taxes put on to a more satisfactory basis, and then, as we have to, pay, pay, pay. There is yet another important point, and that is the fact that the R.A.C. formula only takes the bore into consideration, and if it is adopted permanently its effect upon the design of motor cycle engines will be far-reaching, and, we venture to think, of small benefit either to the manufacturer or user.

### Hill-climbing in New Zealand.

Particulars are to hand by the last mail of a hill-climb held by the Otago (South Island) Motor Club on February 26th at Anderson Bay. A number of returned soldiers were present, and thoroughly enjoyed the proceedings. Competitors were divided into three classes, and each class was run on handicap. Results:

CLASS 1.			
1. A. Scott (2½ New Hudson) .. ..	53s.		
2. F. McDonald (2½ Douglas) .. ..	46½s.		
3. R. Charlton (2½ Douglas) .. ..	50s.		

CLASS 2.			
1. A. E. McDougall (3½ Triumph) .. ..	47s.		
2. H. Burrows (3½ Triumph) .. ..	48s.		
3. E. Strain (4 Triumph) .. ..	44½s.		

SIDE CARS.			
1. F. McDonald (2½ Douglas sc.) .. ..	61½s.		
2. B. Widen (3½ Douglas sc.) .. ..	67½s.		

SEALED HANDICAP.			
1. F. McDonald and R. Charlton.			
2. E. Strain.			

Fastest time of the day: E. Strain (4 Triumph).

### The National Relief Funds.

At the week-end the principal national relief funds stood as follow:

The Prince of Wales's National Relief Fund (£3,153,000 distributed) .. ..	£5,853,519	0	0
Fund for the Sick and Wounded .. ..	3,596,004	0	0
Tobacco Fund .. ..	103,530	0	0
The Queen's Work for Women Fund .. ..	168,961	8	3
The Belgian Relief Fund .. ..	1,502,785	0	0

### A New South Wales Consumption Test.

The Cumberland (N.S.W.) Motor Cycle Club has held a petrol consumption test in Parramatta Park. Each starter was supplied with half a pint of petrol. The first three places were secured as follow:

Rider and machine.	m.p.g.
1. K. Fatterson (4 Zenith) .. ..	148
2. S. Pincombe (3½ Rover) .. ..	131
3. M. Harding (3½ Zenith) .. ..	119

### Ill-considered Opinion.

It was news to the Treasury officials to learn that the R.A.C. formula is practically unknown in the motor cycle world. Not only they, but motoring contributors to the daily papers, who ought to know better, display equal ignorance. Mr. W. H. Berry, in *Saturday's Evening Standard*, writes: "Those owning motor cycles of higher powers (over 4 h.p. R.A.C. rating) cannot grumble at being called upon to pay threequarters of the duty chargeable against a motor car of similar rating, for many of the twin-cylinder motor cycle engines rated by the manufacturers as of 7 to 10 h.p. develop considerably more; in fact, some of the highly-priced high-powered motor cycles selling at anything between £80 and £100 with sidecar develop a greater engine power than many light cars proper." Clearly Mr. Berry is not acquainted with motor cycles, or he would never suggest that a 998 c.c. air-cooled twin-cylinder engine can equal in power a 1,100 c.c. four-cylinder water-cooled light car engine.

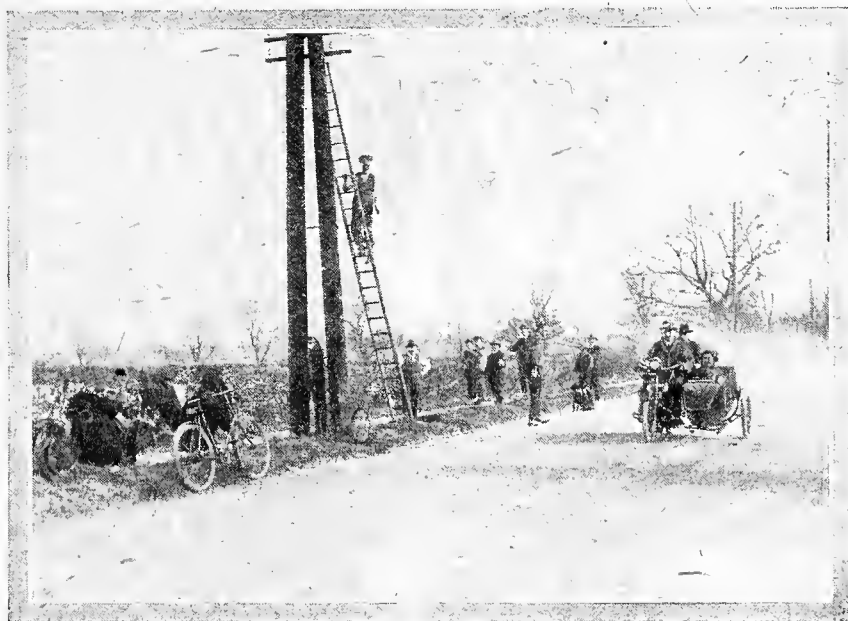
### The Inns of Court O.T.C. Regimental Hill-climb.

The first regimental hill-climb of the Inns of Court O.T.C. will be held at Toms Hill, Aldbury, four miles from Berkhamsted, to-morrow (Friday), beginning at 2 p.m. Mr. F. T. Bidlake has been appointed timekeeper. Altogether there are about forty entries, and the climb is taking place by permission of the Colonel and Adjutant. The surface of the hill is in excellent condition, and there is only one nasty bend, which, however, is not really serious. The organisation is in the hands of Mr. E. V. Ayers-Hunt.

### A Mysterious Failure.

The other day we had an interesting experience on a 3½ h.p. sidecar. The engine was started up quite well from cold, and was then stopped purposely, but considerable trouble was experienced in persuading it to restart. It was then stopped again, and on this occasion very nearly as great trouble was experienced in getting the engine to fire as on the previous start. A run of from ten to fifteen miles was then taken, during which time the engine ran quite well. After a wait of about threequarters of an hour the engine had to be again started, and this time was equally refractory. Once started it continued to run satisfactorily for a considerable time, but on the next attempt to restart it failed altogether.

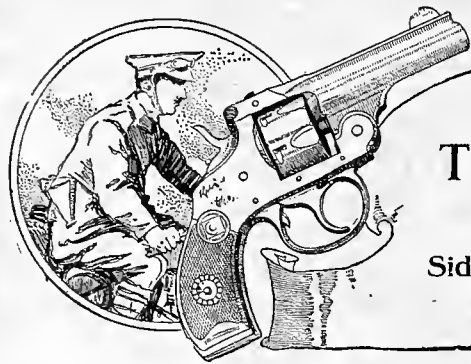
The owner suspected a failure in the vulcanite high-tension brush holder, and when he came to fetch the machine the next morning he brought one of these with him. After fitting it the engine started immediately and ran without a misfire, but the curious part of it is that no puncture, hole, flaw, or crack is visible to the naked eye in the old brush holder.



### RECREATION AND RESTORATION.

Some of the Leicester Volunteers who spent the week-end assisting G.P.O. engineers in restoring telegraph wires brought down by the recent blizzard. Photograph taken on Saturday afternoon last on the Leicester-Loughborough road.





## TRUE TALES OF THE DESPATCH RIDER.

Sidelights on the Life led by Military Motor Cyclists in France.



"THANKEE, sir, I knows a good 'un when I see it," as I handed him my cigarette case. "As I was sayin', what they would do in this 'ere without motors I don't know."

"Yes," I agreed.

The first speaker was a compact little man with keen grey eyes and a humorous, yet firm, mouth set in a weather-beaten but cheery face. He had offered me a lift as I trudged from my billet to my destination, and we were at the moment waltzing along the road from London to Berlin. Waltzing? Well, our progress would be more accurately described as a crab-walk. The *pavé* was covered with a coating of the very best skid-cream, and as we passed, and were passed by, various vehicles, our back wheels pirouetted solemnly from port to star-board and back again, as we made for the crown of the road after each deviation from it. But we were quite content—anything that tries conclusions with a motor lorry is likely to come off a distinct second best.

From the high seat of the heavy Leyland we could command a far-stretching view of the tree-lined and slimy road dotted with conveyances of all kinds, with smaller dots fitting in and out of the gaps in the traffic. Those little dots are always fitting about—they are the despatch riders.

### Unpleasant Riding for the D.R.

Down the road far ahead, now bounding about on the *pavé*, and then sloshing through the deep mud at the side of the road where the cavalry at times disport themselves, is one of these riders. He wears a wallet slung over his shoulder, and the blue and white bands on his arms proclaim the fact that the wallet contains the despatches from which he gets his name.

He is drawing nearer now, and, forced off the *pavé* by a touring car which has just passed us, he has to regain it afterwards. Now one of those incidents happen which do happen sometimes. We, too, swing across to pass a stationary lorry, so the D.R. must stay where he is. We all pass in a line, and as "Signals" sees our vast height towering above him he must feel a tremor lest we "crab-walk" off the *pavé* into him. But we don't, and he grins as the Leyland lumbers past.

The T.T. is no picnic. Nor is despatch riding under these conditions, but there is a sort of idea prevalent at home that these D.R.'s have an easy existence, and a hero's to boot. The last is always true in a quiet way, but the first—!

The wet weather out here impedes the progress of the D.R. in more ways than one. After the mud has dried a little he gets a magnificent automatic brake inside his mudguards. One evening we had a D.R. with a message for us; his face was all muddy, and his hands were indescribable.

Somewhat tentatively—for I did not want him to think I was doubting his ability to hold up—I enquired if he had had a "cok-siddle."

"No, sir," he replied; "I've only been scraping the mud out of my mudguards."

Now, manufacturers, do buck up. When the tale is told we shall hear of more than one effort being spoiled through a late message and consequent delay. You evinced no great keenness to



Lieut. F. M. C. Houghton, 25th Division Cyclist Co., writer of the accompanying article. It was he who suggested in a letter to *The Motor Cycle* the "all-khaki" race meeting held at Brooklands last August.

acquiesce to our demands in times of peace; now it is different. Increase that mudguard clearance, or fit a scraper.

We push-cyclists suffered in the same way, but found that much trouble was caused by the mud adhering to the walls of the tyres, so an ingenious artificer fixed us up with tin scrapers, which abate the nuisance considerably.

Of course, there are times when delay is unavoidable. One place the men go to is only ten minutes' run, but, as it is followed by half an hour's walk across a ploughed field, the total time taken is more like ninety minutes.

Some weeks ago a D.R. was in temporary trouble close to our billet, and we fell into conversation. He was adjusting the clutch of his 7 h.p. Indian, so naturally one of my first questions

was about the general handiness of his machine for this work.

He told me that on *pavé* it was excellent, owing to its spring frame, and that its weight was a help rather than a hindrance, as it kept him so steady, but, as he said to me, "When it *does* start skidding it is a fair devil, and you can't stop it." His Indian was the last of that make he had left after various events at Ypres. Then he shot off amidst a roar of explosions from his hefty "seven," but not before telling me that in his opinion the best machine of all for the work is the Triumph. Usual disclaimers!

### "Pip-Emma."

Of course, the D.R. has a certain amount of routine and discipline to follow and obey. In this particular Division, at any rate, the service head-dress is not insisted upon, so the men can wear comfortable sou'-westers, or whatever they fancy, though racing helmets seem popular.

Each night two are told off for duty from 8 o'clock to 6 a.m., when one goes round with what is called "the post," i.e., a regular delivery of certain information to certain units. The remainder take out their messages in turn, the night duty men resting till 2 o'clock.

Perhaps a few tales of exciting experiences may be of interest. I feel sure they will, but readers of *The Motor Cycle* will see at once that it is practically impossible for a D.R. to have any terrific adventures, such as being chased by an armoured car or "specially" shelled. I am indebted for these tales to a D.R. who has been out here since the early days of the war, has been wounded while on his machine, and has since been granted a well-deserved commission. He was naturally loth to tell me of his experiences, so I am respecting his reticence, and will give him the name he was known to me by.

"Pip-Emma," as he was dubbed from his connections with the Signal Service, came out here during the early days of the war on his privately-owned Triumph, which was taken over by the Government. He talked to me, and as he talked drew sketches on a piece of paper by his side; it was then I noticed he was ambidextrous. The scene of his first yarn was Givenchy.

He had frequently to carry a message along a road running straight towards the enemy lines, which made it necessary for him to extinguish his light after reaching a certain corner, where a sentry was posted to see this was done by all.

**True Tales of the Despatch Rider.—**

Now running parallel to the road on one side was a canal, and on the other was a railway embankment. It used to be the playful habit of one of our armoured trains to proceed down this line, fire a few shots at the Germans, and retire. For some days previously a stranger had been seen wandering about the vicinity in a suspicious manner, and "Pip-Emma" was warned to look out for him as he rode along by the railway. On the night in question the sentry warned him to be more vigilant than ever, so he went along at a level "20" with one eye on the glimmering ooze of the canal to guide him.

Suddenly he steered straight for the bank on his right, and, as he met it at an angle, he jumped off, and, to put it in his own words, "I rushed up the bank just in time to see a shadowy figure with up-flung arms hurl itself down the other side. I gave him two shots. The first man I had ever killed."

"But what," as "Pip-Emma" says, "was he doing on the railway line, and why did he run away?" Perhaps the smoke ring floating slowly to the ceiling could tell us!

Another unpleasant little adventure occurred along the same stretch of road. He had noticed protruding above the surface of the water a round hump, which he concluded was part of a dead horse. As usual, he was riding with his light out, and, before he knew where he was,

he saw some dark shape lying before him. Frantic efforts to avoid it availed him nothing, and into the soft and yielding mass he plunged head first. It was the dead horse, which had been pulled out of the canal and left there.

Nothing daunted, he scraped himself fairly clean and duly walked into the orderly room.

"Is that you bringing in that smell?" rapped out the Adjutant, without turning round.

"Yes, sir," was the meek response.

"Well, *get out!*"

So he got out, and gave his message through the window.

What it feels like to be under fire on a motor bicycle may be divined from "Pip-Emma's" next tale.

As everyone knows, the Huns have a habit of marking various cross roads and other important points for occasional doses of shell fire. On the day in question they had been doing this to a certain cross roads, near which was a supply of our ammunition. "Pip-Emma" was careering along near this place, when suddenly he heard a terrific roar and saw a huge wall of black smoke dead ahead. Thinking his last hour had come, he rode straight for the ditch. The impact made his front fork spring (Triumph) stretch out about a foot long. On its release it closed up again, but broke on the next shell hole. Our friend crawled out of the ditch and rode off none the worse. But it was a near shave for the ammunition.

Later, during a *strafe*, he was arrested as a spy by an officious Sergeant-Major, who detained him for two and a half hours, despite all his explanations and forcible language. Unfortunately, at the time, he had only a verbal message, and only a "pass" to prove his identity. This the S.M. would have none of, saying "Anyone can have a pass." But imagine the face of the Sergeant-Major when he was finally identified by the very person for whom the message was intended.

Now these little incidents are true. I have purposely omitted "Pip's" real name, as I am sure he would have wished it. And no one can deny the possibility of any of these events happening out here in the space of six months—nothing wonderful about them: just the plain truth.

F. M. C. HOUGHTON.

**A MACEDONIAN MESSAGE.**

We are in receipt of an interesting communication from an R.E. motor cyclist officer serving in Macedonia. "Three of my D.R.'s have got commissions in the line," he writes, "and two more have put in for the same job. It is rather heartbreaking to lose all one's best men, but this is usually the way in the motor cyclist section. The old 'Duggies' are still standing up, and have been running over six months now. They would do better with a three-speed gear box though, out here, as we get some fair hills, and the tracks on a wet day with a head wind are a nightmare."



SHIPS OF THE DESERT—ANCIENT AND MODERN.

A photograph taken by Cpl. E. Fedden, a Douglas-mounted despatch rider, in Egypt. The camel track running alongside the macadam road will be noticed.

## A BELT END PROTECTOR AND A NEW TERMINAL.

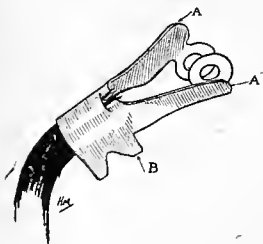
MESSRS. BROWN BROS. LTD., 15, Newman Street, Oxford Street, W., have lately placed on the market two accessories which will appeal to our readers. One is a belt end protector, a device which helps to shorten the distance between the belt ends, and causes the belt to rise to a higher line.



Brown Bros.' new belt end protector.

It also prevents the rubber stripping at the end and takes the strain off the holes, as the bending of the belt is lessened. Other advantages that are claimed for it are that it removes the initial cause of belt slip, and does not restrict free movement of the connecting link; it allows an extra link to be used without impairing the efficiency of the drive, prevents the fastener being accidentally damaged, and, moreover, it gives silent running by preventing the click, due to the metal fastener coming in contact with the pulley. The protector is adjusted to the fastener by means of the lugs D, as far as possible without interfering with the coupling up of the link, then the belt end is shaped so that it abuts closely to the shape of the protector.

The other device is a new form of an old terminal, which is instantly and securely fastened to the plug end on the terminal screw being removed. When once fixed to the wire it is absolutely secure and need never be removed, while the troublesome terminal screw, which is so easily lost, is done away with. It is made suitable for 7 mm. and 10 mm. high-tension wire. To attach the terminal, it is only necessary to squeeze the



New H.T. terminal introduced by Brown Bros.

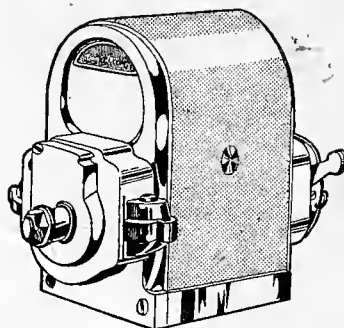
two ends together, press it over the threaded end of the central electrode, and then let go, when it will grip firmly. After fastening on the wire, the ends B are clamped over with pliers.

## A LIVERPOOL MOTOR SCHOOL.

ONE of the many spheres invaded by women, as a result of the ever increasing demand for men for the Army, is that of motor driving, and the number of motor schools throughout the country has, as a result, greatly increased. Messrs. J. Blake and Co., who have been in the motor business at Manchester and Liverpool longer than we can remember, started a school some ten weeks ago, and the particulars thereof which they have sent us suggest that the whole affair has been organised in a most thorough manner. The Blake School of Motoring is at 22, Rodney Street, Liverpool.

## THOMSON-BENNETT MAGNETOS.

THE name of Thomson-Bennett for long before the outbreak of war was associated more with the production of general electrical apparatus as well as the manufacture of an excellently designed British magneto. The latter was gradually gaining popularity. When the shortage of German magnetos caused a great demand for British-made machines Messrs. Thomson-Bennett were in a good position to step in and take full advantage of this opening, and were marketing magnetos of all types, when other firms were only laying down plant and experimenting. The Thomson-Bennett range of models for motor cycles alone is very extensive, there being no fewer than six different types, covering

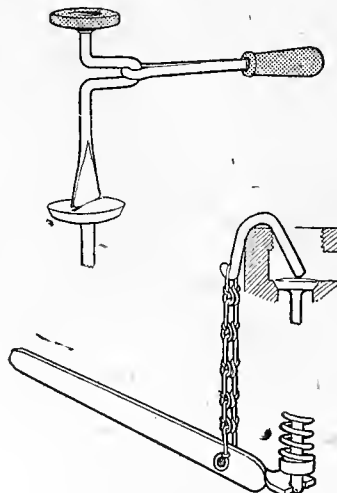


Thomson-Bennett magneto for twin-cylinder machines.

every pattern of motor cycle engine. During a recent visit to the T.B. works we were impressed by the excellent arrangements made for the prompt carrying out of the large orders on hand. In order to contend more satisfactorily with some of the Government contracts it has been found necessary to organise several new departments.

## TWO HANDY TOOLS.

THE valve spring lifter made by Messrs. A. T. Austin and Co., of Stinchley, Birmingham, has been slightly altered in order to cheapen pro-



Austin valve grinder (top) and valve remover.

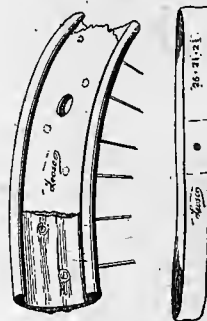
duction and increase the supply. It consists of a lever made of flat steel, which fits under the valve spring cap. The fulcrum for the leverage is formed by a chain, which is attached to a round steel hook. The latter hooks into the valve cap orifice, and at the same time prevents the valve lifting when the spring cap is levered up in order to remove the cotter.

Another useful tool made by this firm is a neat valve-grinding tool, intended to be carried in the tool-kit, and with the aid of which it is possible to grind in the valves while the cylinder is in position, even though the tank overhangs. The tool consists of a cranked screwdriver which can be rotated by means of a rod having a bearing on the crank.

## LEOSCO TUBE SAVER.

FROM time to time we have heard complaints from motorists respecting tyre troubles due to friction on the spoke heads and corrosion by rust in the rim. Personally, we have not experienced this trouble for many years, since most makers of beaded edge covers allow a good overlap of canvas for the very purpose of protecting the inner tube. But no doubt an innovation by Messrs. Leosco Swain and Co., of

237, Deansgate, Manchester, will appeal to those of our readers who may wish to make doubly secure in this direction. The Leosco tube saver consists of an endless band of good red rubber, thickened in centre and tapered to the edges, which is intended to be stretched over and bedded down in the rim. It effectively prevents contact between the inner tube and the often rusty bed of the rim. The makers also maintain that it assists to hold the cover in place and prevents creeping. It is made in all sizes for motor cycles at 3s. 9d. each, and for cars from 5s. 9d. to 12s.



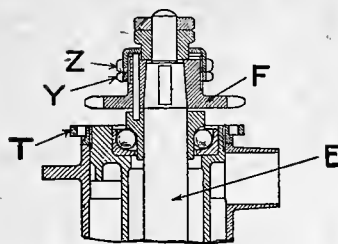
The Leosco band to protect spoke heads.

## CARE OF THE DOUGLAS.

ONE of the most comprehensive booklets dealing with the care and upkeep of individual machines is that published by Douglas Bros., a copy of whose 1916 handbook we have just received. There are over a hundred pages and many illustrations, some of the latter being "ghost" views and particularly interesting. It is written in simple language, so that the novice who starts with a Douglas will easily be able to derive many useful tips from the makers' booklet, a copy of which is included in the tool kit of each new machine when it leaves the factory. Quite a feature of the booklet is the wonderfully complete illustrated price list of spare parts. To other than purchasers of new Douglases, who have a copy free, a charge of 1s. is made for the Douglas booklet.

## ENFIELD GEAR IMPROVEMENTS.

TWO useful details have been lately introduced into the Enfield two-speed gear. One is an improved method of adjusting the main spindle bearings, the other a new adjusting mechanism for the engine chains. In previous models the cone for adjustment of the main spindle bearings was situated behind the driving sprocket, and was therefore in a rather inaccessible position. In the latest model this cone is made a sliding fit on the spindle, and, by means of a locking nut situated outside the driving sprocket, the cone can be tightened or loosened without disturbing the sprocket or any other part. The method of adjustment will



New method of adjusting main bearing cone of Enfield gear.

E. Main spindle. F. Sprocket.  
T. Lock nut for bottom bracket.  
Y. Lock nut for cone-adjusting nut.  
Z. Cone-adjusting nut.

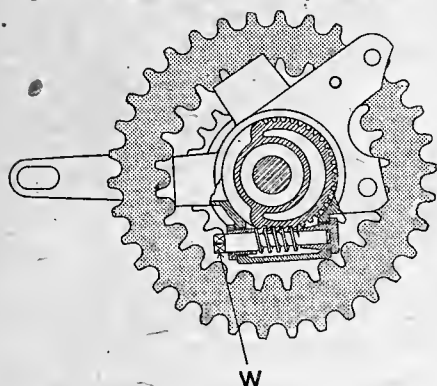
In referring to the drawing, the method of adjustment is as follows: On the end of the bottom bracket eccentric will be found a lock ring T. This must be loosened, after which, by turning the worm W by means of a special square-headed spanner, the eccentric bracket is turned, and the necessary chain adjustment will be effected. The lock nut T must then be securely tightened.

## SIDECARRIERS FOR WAR WORK.

A SERVICEABLE sidecarrier has been supplied to the Triumph Cycle Co. by Messrs. the Gloria Cycle Co. for carrying munition material. The chassis is the latest pattern standard model Gloria, including spring wheel and special five-point attachment. In order to render the fitting of the large box carrier possible, the rear axle of the frame has been dropped and a special form of springing has been adopted. Instead of the usual transverse front and rear C springs, parallel quarter-elliptic springs both back and front are used, while shackles are fitted so that the full movement of the springs may be obtained.

The box body is covered by a lid, which opens in two halves hinged back and front. The nose of the body forms a spacious locker for spares. The whole outfit is well finished.

The Gloria Cycle Co. inform us that they are in a position to supply Government controlled works with these carriers provided they are to be used for war work purposes.

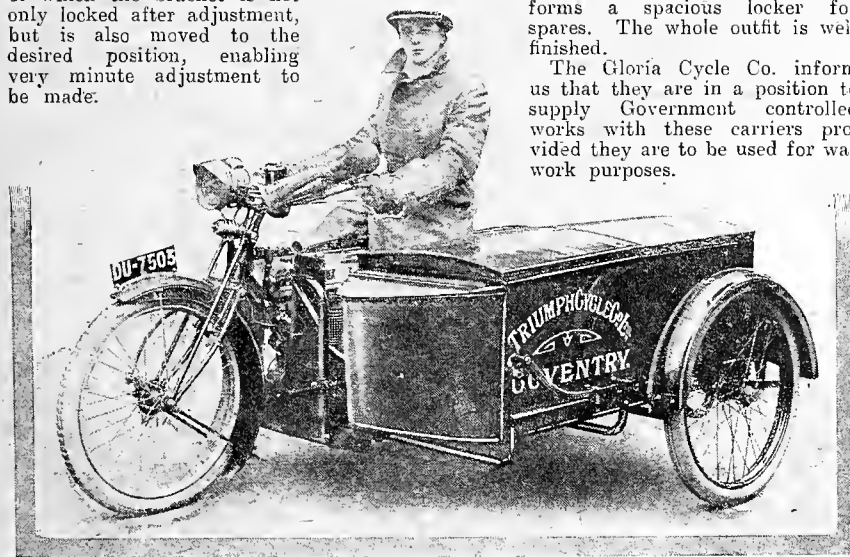


New method of Enfield chain adjustment.

W is the operating worm.

be clearly seen from the illustration, the bearings being adjusted by the nut Z and locked in position by the lock nut Y, both of which have right-hand threads.

In previous Enfield gears the eccentric gear bracket was held in position, by means of a quadrant, no means being provided for moving the bracket after the quadrant had been loosened. In place of this quadrant a system of worm and sector is now adopted, by means of which the bracket is not only locked after adjustment, but is also moved to the desired position, enabling very minute adjustment to be made.



A Triumph-Gloria sidecarrier engaged on munition work.

## Average Prices OF Second-hand Machines.

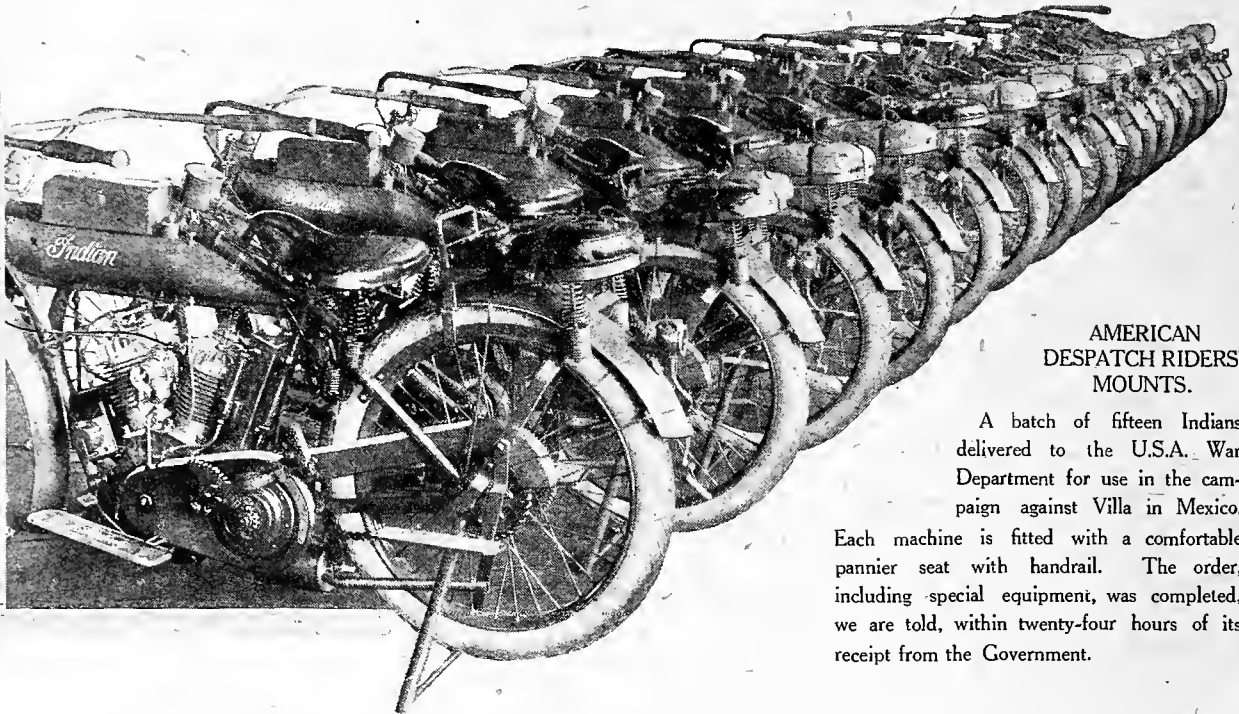
From "The Motor Cycle" of April 6th, 1916

Make.	Year	H.P.	Average for last week.	Latest weekly average obtainable
A.B.C.	1915	3 1/2	4-speed	£63
A.J.S.	1915	6	3-sp. sidecar	£82
"	1914	6	3-sp. sidecar	£72
"	1912	6	3-sp. sidecar	£44
"	1915	2 1/2	3-speed	£50
"	1915	2 1/2	3-sp. T.T.	£39
"	1914	2 1/2	2-speed	£36
Alton	1916	2 1/2	2-stroke	£35
"	1915	2 1/2	2-stroke	£35
Bat	1914	5	3-sp. sidecar	£53
"	1913	6	2-sp. sidecar	£32
Blackburne	1915	3 1/2	3-speed	£53
Bradbury	1914	4	3-sp. sidecar	£41
"	1913	4	sidecar	£32
"	1913	4	2-speed	£26
B.S.A.	1915	4 1/2	3-sp. sidecar	£62
"	1914	4 1/2	3-sp. sidecar	£38
"	1913	3 1/2	2-sp. sidecar	£42
"	1915	4 1/2	3-speed	£47
Caltroppe	1915	2 1/2	2-speed	£27
Clyno	1914	6	3-sp. sidecar	£63
"	1913	6	3-sp. sidecar	£51
"	1912	6	2-sp. sidecar	£35
Cov. Eagle	1915	2 1/2	2-stroke	£25
Douglas	1915	2 1/2	3-speed	£47
"	1915	2 1/2	2-speed	£43
"	1915	4	3-sp. sidecar	£59
"	1914	2 1/2	2-speed	£39
"	1914	2 1/2	2-sp. T.T.	£35
"	1913	2 1/2	2-sp. kick start	£34
"	1913	2 1/2	2-sp. T.T.	£32
"	1913	2 1/2	2-sp. T.T.	£38
Enfield	1916	6	2-sp. sidecar	£79
"	1915	6	2-sp. sidecar	£64
"	1914	6	2-sp. sidecar	£57
"	1913	6	2-sp. sidecar	£48
"	1912	6	2-sp. sidecar	£39
"	1915	3	2-speed	£13
"	1914	3	2-speed	£35
H.-Davidson	1915	8	3-speed	£67
"	1915	8	3-sp. sidecar	£72
Henderson	1915	4	cyl. sidecar	£80
Hobart	1915	2 1/2	2-stroke	£26
Humber	1914	2 1/2	3-speed	£26
"	1912	3	2-sp. sidecar	£26
"	1911	3 1/2	2-sp. sidecar	£22
Indian	1915	7	3-sp. sidecar	£75
"	1915	7	T.T.	£48
"	1915	5	3-speed	£49
"	1915	3 1/2	3-speed	£48
"	1914	7	2-sp. sidecar	£52
"	1914	7	2-speed	£43
James	1915	3 1/2	3-speed	£48
"	1914	4 1/2	3-sp. sidecar	£47
"	1913	4 1/2	3-sp. sidecar	£40
Lea-Francis	1914	3 1/2	2-speed	£48
Levis	1915	8	popular	£21
Matchless	1914	8	3-sp. sidecar	£71
"	1913	8	2-sp. sidecar	£55
New Hudson	1910	6	3-sp. sidecar	£61
"	1915	2 1/2	2-speed	£29
New Imperia	1915	2 1/2	2-speed	£27
Norton	1915	3 1/2	T.T.	£46
P. & M.	1914	3 1/2	2-sp. sidecar	£60
"	1913	3 1/2	2-sp. sidecar	£38
Premier	1915	3 1/2	3-speed	£44
"	1914	3 1/2	3-speed	£23
"	1913	3 1/2	sidecar	£34
Quadrant	1914	4 1/2	3-sp. sidecar	£46
Rex	1913	6	2-sp. sidecar	£38
Rover	1915	3 1/2	3-sp. sidecar	£63
"	1914	3 1/2	3-sp. sidecar	£42
"	1914	3 1/2	3-speed	£38
"	1913	3 1/2	3-sp. sidecar	£34
Royal Ruby	1915	2 1/2	2-stroke	£22
Rudge	1915	3 1/2	multi T.T.	£52
"	1914	3 1/2	multi sidecar	£38
"	1913	3 1/2	multi	£30
"	1913	3 1/2	multi sidecar	£34
"	1912	3 1/2	multi	£25
Scott	1914	3 1/2	2-sp. sidecar	£52
"	1913	3 1/2	2-sp. sidecar	£38
Sunbeam	1915	3 1/2	3-sp. sidecar	£69
"	1915	3 1/2	3-speed	£59
Triumph	1915	2 1/2	2-sp. 2-stroke	£36
"	1915	4	3-speed	£41
"	1914	4	3-sp. sidecar	£50
"	1914	4	3-speed	£39
"	1913	3 1/2	3-sp. sidecar	£50
Williamson	1914	8	2-sp. sidecar	£70
Wolf	1914	2 1/2	2-sp. sidecar	£18
Zenith	1914	6	Gradua sidecar	£52
"	1913	6	Gradua	£38



## BETTER LATE THAN NEVER!

UNCLE SAM FOLLOWS JOHN BULL'S LEAD.

AMERICAN  
DESPATCH RIDERS'  
MOUNTS.

A batch of fifteen Indians delivered to the U.S.A. War Department for use in the campaign against Villa in Mexico.

Each machine is fitted with a comfortable pannier seat with handrail. The order, including special equipment, was completed, we are told, within twenty-four hours of its receipt from the Government.

APPLICATION TO JOIN THE MOTOR MACHINE  
GUN SERVICE.

Name .....

Address .....

Chest measurement ..... Height .....

Group No. ....

or

Age .....

Class No. ....

How long have you been a motor cyclist? .....

Can you execute running repairs? .....

Are you fit for overseas service? .....

Occupation .....

When are you called up? .....

WHAT DATE COULD YOU JOIN? .....

After filling in the above particulars return to:

MR. GEOFFREY SMITH,  
Inspecting Officer,  
19, Hertford Street,  
COVENTRY.

(Issue April 13th, 1916.)

## TAXATION OF MOTOR CYCLES.

Examples of Machines Taxed on Treasury  
Rating and on "The Motor Cycle" plan.

(See also pages 349 and 350.)

THE following table gives the proposed tax on some well-known motor cycles, both on the Treasury rating and the capacity rating suggested by *The Motor Cycle*:

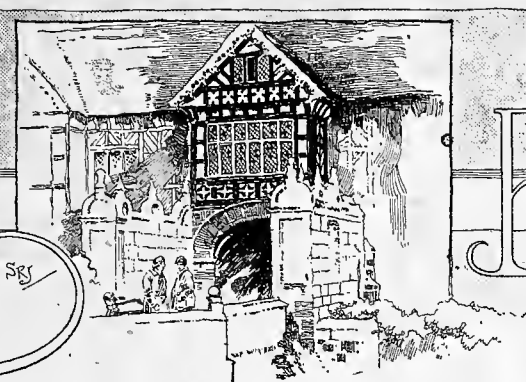
Name.	H.P.	Capacity.	Treasury.	<i>The Motor Cycle.</i>
A.B.C. ....	3½	494	£ 3 3 0	£ 3 2 0
Abingdon ....	6	795	4 14 6	3 13 6
A.J.S. ....	6	748	4 14 6	3 3 0
A.J.S. ....	4	550	3 0 0	2 12 6
Ariel ....	3½	498	3 3 0	2 2 0
Bat ....	6	770	4 14 6	3 13 6
Bat ....	5	654	3 3 0	3 3 0
Bradbury ....	4	554	3 3 0	2 12 6
Brough ....	3½	497	3 3 0	2 2 0
Calthorpe ....	4	496	3 3 0	2 2 0
Campion ....	8	976	4 14 6	4 4 0
Chater-Lea ....	8	964	4 14 6	4 4 0
Douglas ....	2½	345	3 3 0	2 2 0
Enfield ....	6	770	4 14 6	3 13 6
Enfield ....	3	425	3 3 0	2 2 0
Lea-Francis ....	3½	496	3 3 0	2 2 0
New Hudson ....	6	770	4 14 6	3 13 6
Norton ....	3½	490	2 2 0	2 2 0
Norton ....	4	633	3 3 0	3 3 0
P. & M. ....	3½	499	3 3 0	2 2 0
Rover ....	3½	499	3 3 0	2 2 0
Rudge ....	3½	499	3 3 0	2 2 0
Sunbeam ....	8	992	4 14 6	4 4 0
Sunbeam ....	3½	499	3 3 0	2 2 0
Triumph ....	4	550	3 3 0	2 12 6
Scott ....	3½	533	4 14 6	2 12 6
Zenith ....	5	654	3 3 0	3 3 0

It may be assumed that on all single-cylinder light-weights, whether two-stroke or four-stroke, the tax will be £2 2s. The observant reader will notice that the proposed taxes bear very heavily upon multi-cylinder machines, especially when of small and medium capacity.

See page 351 for the Recruiting Section.

# Letters to the

# Editor



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

## Some Notes on the Operation of Two-stroke Engines.

Sir,—Under this heading Mr. William E. Slater put forward a new theory for their method of working. It was that when at the end of the stroke the burnt gas rushes through the exhaust port a partial vacuum is formed which helps the entrance of the fresh charge. I agree to this, and am willing to prove it, but I wish to wait till someone disagrees with it before I attempt a proof.

R. E. COLERIDGE.

## A Warning.

Sir,—Buyers of second-hand motor cycles are warned of a gang operating in London, who act as touts for unscrupulous dealers who have some old iron on their hands. They usually advertise from a private address, on the look-out for "mugs" who know little or nothing of the value of second-hand machines. For instance, they will invariably try to pass off, say, a 1912 machine for a 1914, and if the purchaser does not insist on a thorough test before buying, he is *had* as I was.

WARNING.—

## Pleasure (?) Motoring.

Sir,—With the new increase on railway fares, I certainly think the War Savings Committee should drop their anti-motor and motor cycle campaign, especially with regard to the latter. If only they would look further than their nose they would see that a saving of 50% at least would be effected by using motor cycles instead of the railway. For instance, at Easter I intend going to Burton-on-Trent. The price of a third-class single ticket, with the new tax, is about 11s., while at the outside the same journey by motor cycle would cost 5s.

Ordinary pedestrians look askance at motor cyclists at the present moment as if they were committing some criminal offence by taking their pleasure in the open air. Instead of police traps, we shall soon expect to see snipers waiting for us on deserted country roads to rid the country of such unpatriotic individuals.

H. GERALD SULLIVAN.

Herne Hill, S.E.

## Paraffin as a Fuel.

Sir,—The rising price of petrol makes the paraffin suggestions of your correspondents of considerable interest.

A few weeks ago I saw the following arrangement on a Triumph. The machine was started on petrol, which was turned off when the engine was warm and paraffin turned on. The paraffin feed pipe was taken in and out of the flanges of the cylinder, so when it arrived at the carburetter it was at a temperature at which it would vaporise much more easily than when cold. Of course, the paraffin pipe might have been taken round the silencer instead, as it might hamper the removal of the cylinder in the former case.

I should like to hear the opinions of your readers as to whether the compression could be lowered sufficiently for using paraffin by inserting a washer between the cylinder and the crank case.

F.W.A.

Sir,—The letters on the above subject are rather puzzling, if not actually contradictory. I am hoping for more and clearer explanations. I have tried a half and half mixture on my small two-stroke with Amac carburetter, and could not

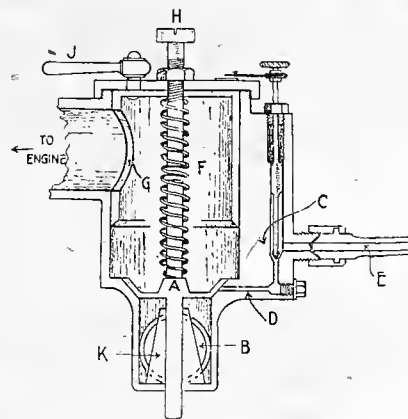
start at all. Would "E.S." and "FE 535" give us a little more information? Apparently, very shortly, if paraffin cannot be used, we shall have to lay up our machines, as petrol will be unobtainable.

I should like to add that I feel sure Spots gives life and energy when added to petrol, but it does not seem to dissolve in paraffin.

R.C.W.E.

## Floatless Carburetters.

Sir,—No doubt it will be of some interest to readers, so I have the pleasure of drawing a rough sketch of one which



An old design for a floatless carburetter.  
See letter on this page.

- |                       |                       |
|-----------------------|-----------------------|
| A. Valve and mixer    | F. Mixing chamber     |
| B. Air inlet          | G. Throttle           |
| C. Needle valve       | H. Adjuster and screw |
| D. Sprayer            | J. Throttle lever     |
| E. Petrol supply pipe | K. Valve guide        |

obtained with the throttle almost closed and spark well advanced.

H. B. HOBSON.

## What is a Spring Frame?

Sir,—As the designer of the Edmund spring frame motor cycle, and now a lieutenant in the R.F.C. serving in France, I have read with much interest a query by H. A. Steytler, headed "Spring Frame Design," and published in your issue of March 23rd. I would be glad if you would insert in your columns the following:

A spring frame, in my opinion, is one in which the springing is so designed to give the rider a maximum amount of comfort. This had been carried out in the Edmund principle by a double frame, one working through the other, and the movement between each being controlled by laminated springs, the combination forming a really efficient spring frame.

I might mention that I have no difficulty in obtaining my copy of *The Motor Cycle*, it being sold in most of the small towns behind the firing line.

CHARLES EDMUND HOLAWAY, Lt. R.F.C.  
B.E.F., France.

### Derby Groups and the M.T., A.S.C.

Sir,—I quite agree with "Subaltern's" remarks in your issue of April 6th, and I am sure many others are beginning to think the same way. Why such men as those in the M.T. and A.S.C. should be paid 6s. per day for practically no risk is more than I can understand.

I am going in the M.T. under the Derby Group system (at least I enlisted on that understanding), but I certainly do not expect the man who enlists for the trenches to get less pay than I who run very little risk.

Quite right, "Subaltern"; the war is not going to be won by driving motors; it is the man in the trenches that is really going to end it, and "Ex-South African Volunteer" must surely understand that women can quickly be trained to do our work.

Trusting you will see your way clear to publish this letter,  
ANGLO-INDIAN.

### Motor Cycle Taxation.

Sir,—With regard to the proposed increased taxation on motor cycles, I do not think any motor cyclist could object to the £2 2s. tax, but I do not think the proposal to make motor cycles of over 4 h.p. pay threequarters of the tax on a light car a fair or equitable one. This will bear very hard on riders of, say,  $4\frac{1}{2}$  h.p., and will simply cause a loss of revenue, as many riders of moderate means will have to give up riding. Could you not use your influence and the influence of your paper to have this proposal modified, say a sliding scale starting at £2 2s. for  $3\frac{1}{2}$  h.p. running up to the threequarter light car tax for high-powered cycles of 8-9 h.p.? I think this is a matter in which you could render great assistance to your readers.

J. H. PILLING.

Sir,—Is not this a real injustice?

The tax on the millionaire's 60 h.p. car increased by 200%.

The tax on the poor man's sidecar outfit increased by 372.5%.

Motor cyclists must tell the Chancellor that they are willing to bear their share of the increased taxes, but that a fair scheme should be substituted, say, 5s. or 7s. 6d. per 100 c.c.

R.J.B.

Sir,—Would I be presuming if I ask you to insert the following in your "Letters to the Editor" column? To take a few examples:

"X" has an old 8 h.p. twin and sidecar, used for business and pleasure, cash value £35 at the highest estimate; extra tax £3 14s. 6d.

"Y" has an up-to-date  $3\frac{1}{2}$  h.p. combination, used solely for pleasure, cash value about £80; extra tax £2 3s.

"Z" has a pony and trap, used for the same purposes exactly as "X," cash value about £50; extra tax none.

Other cases in plenty could be quoted, particularly the unfortunate owners of old cars, hard hit through taxing motors solely by horse-power. I think if taxes were imposed with more regard to age of machine and the cash value the higher charges would reach the man who without doubt is the best able to pay, viz., the man who can afford to take out a new machine each year. In any case, why this smashing, badly-aimed blow at motors? Lots of other things might contribute a portion, and, by taking a larger radius, be more evenly distributed all round. As a patriot I say that what we want is a downright straightforward war tax on all men to operate till the war is over, and not a penalty on a certain class.

A. PETTITT.

Sir,—Re your Note on the Budget, are your figures correct regarding twin-cylinder machines? If 81 mm. single is 4.07 h.p., why should twins 57 mm. to 72 mm. bore be 6 h.p. and 73 mm. to 98 mm. be 8 h.p.? My twin machine is, I think, 76 mm. or 78 mm., and I take it is between 7 h.p. and 8 h.p.

If 81 mm., then it would be, in my estimation,  $4.07 \times 2$  cylinders = 8.14 h.p., as I understand that in the case of an engine having two or more cylinders the h.p. is the sum of the separate cylinders.

If you are correct, then my machine is for sale or storage, as my mileage is too low to make it profitable to use the machine, the tax cost putting  $\frac{1}{2}$ d. per mile on my running expenses.

I might add that I do not mind doing my bit, if all users of other motor vehicles do theirs. The fly in the ointment is this: "Why are motor 'buses let off?"

Probably I shall be told, "Because they are commercial vehicles." Well, my machine is used about 60% for pleasure and 30% for business, but I get no rebate or consideration, yet I have to pay taxes to keep the roads in repair for these vehicles to knock them to pieces. The only compensation I get is plenty of dust (or mud), as their drivers refuse often to hear you or get out of the way, and the pleasure of getting shaken into a jelly, not to mention the damage done to the machine by excessive road vibration.

The railway companies have to keep their own roads in order; also, I understand, some of the trackless electric car systems owned by councils have to contribute towards the upkeep of the roads over which they run—so much per mile run.

The fairest tax, I think, is to tax petrol, then each one contributes his fair share, according to the horse-power of his machine and the miles run. By petrol I mean any spirit or gas used by internal combustion engines. HUT.

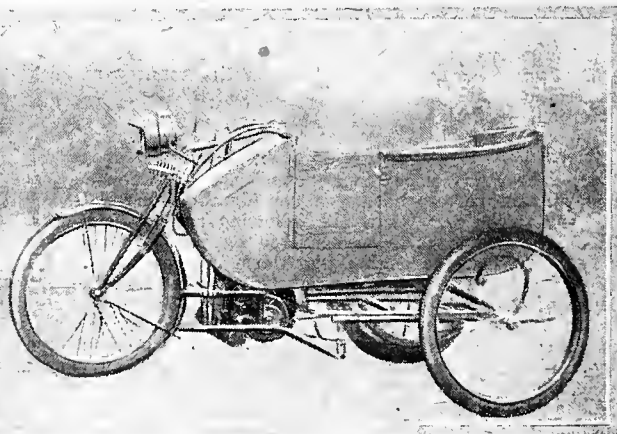
[Our correspondent has apparently criticised our figures without reading them carefully. We did not say that twins of 57 mm. to 72 mm. bore were rated at 6 h.p. —Ed.]

### Overheating on Two-strokes.

Sir,—I notice in your issue of March 23rd your contributor "Ixion" states, "If I set any two-stroke of my acquaintance to run ten miles on even a 7 to 1 gear the thermometers in the whole country would go up 10° apiece," and mentions that his present "two-stroke almost welds the piston to the cylinder after climbing not more than six hundred yards up a test hill on a  $8\frac{1}{2}$  bottom gear." I quite agree with your correspondent that some two-strokes do get terribly hot if driven all out on a low gear, owing, in my opinion, to insufficient and improper methods of lubrication.

Now for the past three years I have ridden the Levis two-stroke, and have yet to find one that will get uncomfortably hot, provided the driver will oil it freely. As a matter of fact, I regularly climb hills over a mile long with a  $2\frac{3}{4}$  h.p. Levis and sidecar with a 12 stone passenger on a  $12\frac{1}{2}$  to 1 gear, and when reaching the top I can almost bear my hand on the cylinder. The reason that these machines will stand up to it lies in their method of lubrication, coupled with their excellent design. As you are no doubt aware, the Levis principle of lubrication is to lead the oil direct to the cylinder wall and the main bearings, thence through the hollow crankshaft to the big end and magneto drive side. This means that all the working parts are running in oil, not oil fog as in most two-strokes.

G. W. WILKIN.



### A RHODESIAN BUILT SIDECAR.

Mr. H. W. Tyzack, of Que Que, South Rhodesia, sends us this photograph of a sidecar he and a friend built of light sheet steel. Attached to a 1913 Triumph it rides very well, we are told, and the object in building it so high was to keep the passenger free from the dust.

**The Shortage of Petrol Cans.**

Sir,—The following extract from "The First Hundred Thousand" is interesting in connection with your recent references to restrictions in the petrol supply:

"The water is conveyed to us in petrol tins—the old familiar friends, Shell and Pratt—hundreds of them. Motorists at home must be feeling the shortage."

T 4667.

**Carbonisation.**

Sir,—With regard to recent letters in *The Motor Cycle* re the cleaning of engines, I agree with "Nixon." I drive a 5.6 h.p. "Big Single" Excelsior and a 2½ h.p. Allon; from "Nixon's" description I gather that he has also owned that particular "Big Single." I drive with an Empress sidecar, and see no reason for taking down the engine before the completion of 5,000-6,000 miles; also, I never experience chain snatch, and Avon combination oversize tyres wear splendidly on the back wheel. This combination is a comfortable and "go anywhere" turnout. I drove my Allon 2,000 miles, and then took it to the makers' Holborn depot for cleaning (I had not time just then to do it myself owing to military duties); when I called for it, I was informed that no decarbonising had been done, as there was none to do. Since then it has run about 1,000 miles, and I took the engine down myself. It was all to no purpose; there was no deposit to remove, and the engine was like a new pin; this machine is comfortable, speedy, and will take me anywhere. I weigh 15 stone. It may interest your readers to know, also, that I find "Spots" excellent petrol savers, and there is less tendency to overheat when using them. Usual disclaimers.

H. J. DUNNE COOKE, Sec.-Lt.

**Average Speed.**

Sir,—On looking through the Correspondence Columns of your issue of March 30th, there is an effusion by "Top Feed Carburetter" that I cannot pass without comment.

The writer talks glibly of an average speed of 45 m.p.h. I wonder if he expects your readers to swallow such nonsense; if so, he is insulting their intelligence. Some months ago I did a run of 300 miles with sidecar and passenger. The machine was a very fast one indeed, and I was trying my best to do the distance in the shortest time possible. On the open road my speed was seldom under, and often over, 40 m.p.h. It took me exactly twelve hours' running time for the journey, average 25 m.p.h.

About the same time as my run I read in your pages of a North-country rider going down to Brooklands on an A.B.C. machine solo. While there he won several speed events. It took him ten hours for the 300 miles.

I have been a keen rider for eight years, and have owned ten of the best machines obtainable. Again and again, over give and take roads, and with early morning starts, I have tried to do distances of fifty and sixty miles in the shortest time possible to me, yet I have never been able to beat an average of 32 or 33 m.p.h. I am speaking of touring machines in perfect tune. This average meant all out on every inch of clear road. "Top Feed Carburetter," to average his 45 m.p.h. must get along in the open at about 72 m.p.h.—a speed of, I should think, at least 15 m.p.h. above the normal capacity of his machine.

For his information, let me say that on a journey from London to Edinburgh a Rolls-Royce that can do 60 m.p.h. with ease, and can go over roads at high speed, where a motor cyclist would be compelled to slow down, does not average over 24 or 25 m.p.h. on the journey. Further, does our friend know that the 10 a.m. express from King's Cross to Edinburgh does not average over 47½ m.p.h.? has only about five stops, no traffic, no cross roads, no pot-holes, etc.

I should very much like to hear what "Ixion" has to say about "average speeds."

OSBORNE BLYTHE, Licentiate R.I.B.A.

**Two-stroke after 1,000 Miles.**

Sir,—As several of your readers have given you their experiences of two-stroke engines, I beg to give you mine. I first took my engine down after 3,613 miles, as I thought I noticed a slight loss of power on the hills, but I was never more surprised in all my life. The amount of carbon deposit was so small that I am sure I could have gone quite another 1,000 miles, had I taken the trouble to clean out the exhaust port. This I had not touched; in fact, I had not touched

a single nut since the machine was new. I think this speaks well of the Levis workmanship.

The rings on the piston were quite free, with the exception of the top one; this was only partly stuck on the exhaust side, so slightly that I removed it quite easily. Carbon on the piston top was very slight indeed; in fact, nothing to speak of.

I replaced cylinder, and have not taken it off again, although I have covered over 1,600 miles, and I am sure I shall be able to get another 1,000 if things go on as they are at present. Wear and tear of tyres are very light, although I have had to fit a new one on the back wheel, because I was rather unlucky in getting it badly cut through having to go over some very rough country. A new belt was fitted at the same time, not because the old one was worn out, but because I was going on a 100-mile run, and I do not like tyre and belt trouble at night, especially in winter time. On my last journey in January this year I did just over 100 miles against rough weather and hilly roads at an average of 110 m.p.g., my average speed being 25 m.p.h. I can get up to 40 m.p.h., and the engine will two-stroke at walking pace. Of course I do not travel at 40 m.p.h. for long, as I have a great respect for my little engine, and I do not think anyone can wish for a better little mount for a lightweight. I might say I am in no way connected with Messrs. Butterfields, Ltd.

A SATISFIED LEVIS OWNER.

**Motor Cycle Taxation.**

Sir,—I hope you will use your powerful influence with the Chancellor of the Exchequer to get some modification of his proposals in regard to motor taxation. I would wish to appeal particularly on behalf of the owners of Auto-wheels. I have always felt that the taxation of £1 was grossly excessive, but now that it is to be doubled the disparity against these little vehicles becomes more pronounced than ever, and the injustice more keenly felt.

I am sure you would earn the gratitude of Auto-wheel users, most of whom are ladies, if you would take up the cudgels on their behalf.

FLORENCE E. LEPPER.

Sir,—Amongst the proposed new taxes introduced by Mr McKenna I observe that the tax on motor cycles under 4 h.p. is to be increased by 22s. Surely this will come rather hard on the owners of low-powered machines; such as baby two-strokes, also Auto-wheels. The many motor cyclists who have joined the Army will likewise be hit. To quote my own case as an example, I failed to join the R.F.C. as a cyclist on account of short sight, and am now in an infantry regiment for home service. Every fortnight I can get a week-end pass, and thoroughly enjoy a short run on my 3 h.p. Enfield. Now, after giving up a position worth £2 10s. a week, I have to pay extra on train fare to get home, an exorbitant price for petrol, and on top of that it seems that I must pay an extra 22s. per annum, all out of the large sum of 1s. a day. Otherwise I give up the one luxury I now have, and not entirely a luxury, as a certain lady friend lives twenty miles away from my home at Leyton. Could not soldiers be exempt until the war is over, when they would willingly pay?

While writing I must say a word in favour of my Enfield. After over 6,000 miles I have only had one engine stoppage, which was entirely my own fault. The gear is excellent and the machine takes all the hills I have tried, many in the Lake District. I have done 300 miles comfortably in a day, and a non-stop run of 120 miles in just under four hours, so you will readily understand I have no wish to part with so trusty a mount.

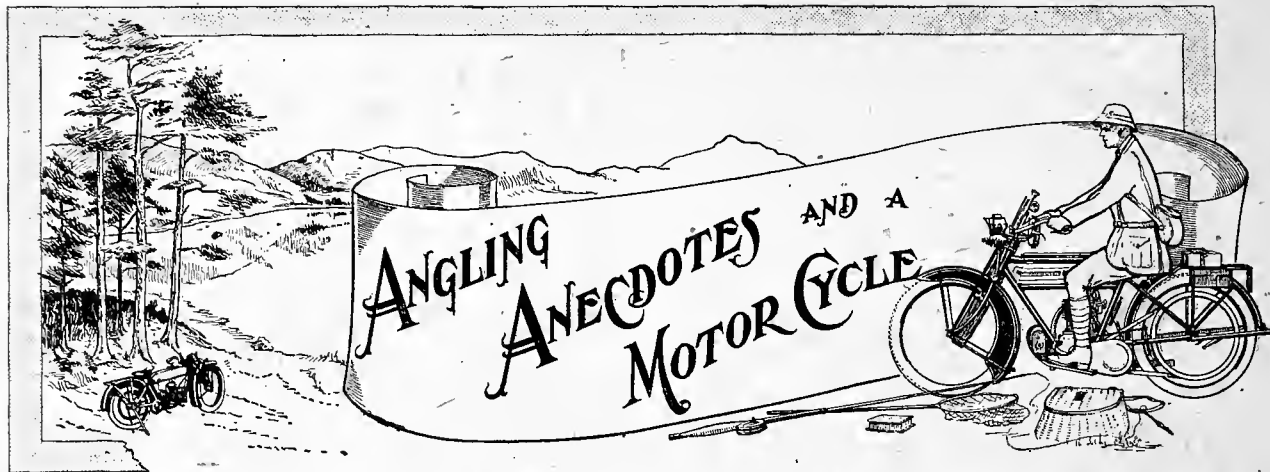
F. A. BUNN.

[We are sorry to tell our correspondent that unless some change is made his position is worse than he thinks, for on the Treasury rating, which is quite unsuitable for estimating the h.p. of motor cycles, a 3 h.p. Enfield is rated at 4.46 h.p., and the new tax will be £3 3s.—Ed.]

**SUMMARY OF CORRESPONDENCE.**

**MOTOR CYCLING IN A BLIZZARD.**—Mr Harry Smith, of the Rover Co., Ltd., writes: "The sequel to the paragraph published in your last issue is that on my return journey, when approaching Stivichale Corner, I got too near the ditch, and slipped in (trying to avoid a motor cyclist who was blazing away with his face to the blizzard). Result, had to leave the car in the ditch and walk back to Coventry."





### SOME USEFUL HINTS AND AMUSING YARNS.

**N**O outdoor sport or recreation has suffered less by the war than the sport of angling. Football, cricket, hunting, shooting, are all more or less at a standstill, yet our famous lochs and rivers continue to draw as many anglers as hitherto.

The explanation for this state of affairs is not far distant, for a day's angling can be arranged at short notice, and three or four participants are not necessary to the sport. The soldier home on leave or still in training, the convalescent, the busy munition worker—all are free to visit the water if their interests lie in that direction, and can one imagine a finer relaxation for jaded nerves than that of idling away the hours of sunshine with rod and landing net? The sidecar outfit or the solo machine is, of course, indispensable if one is to make the best of the day—quite apart from the pleasure of combining two delightful hobbies in a way that adds to the pleasure of both.

phone are alone responsible. A telephone message conveys the news that conditions for angling are favourable, and an hour or two later anglers from distant cities appear at the water's edge.

For the really keen fisherman, however, there is still an unlimited field for exploration. Bad roads and bad hills separate many of the finest angling waters from the thickly peopled centres, and the motor cyclist who has no objection to a little rough riding can generally evade the crowds. Moreover, the pleasure of fishing these virgin waters is quite worth the difficulties encountered *en route*.

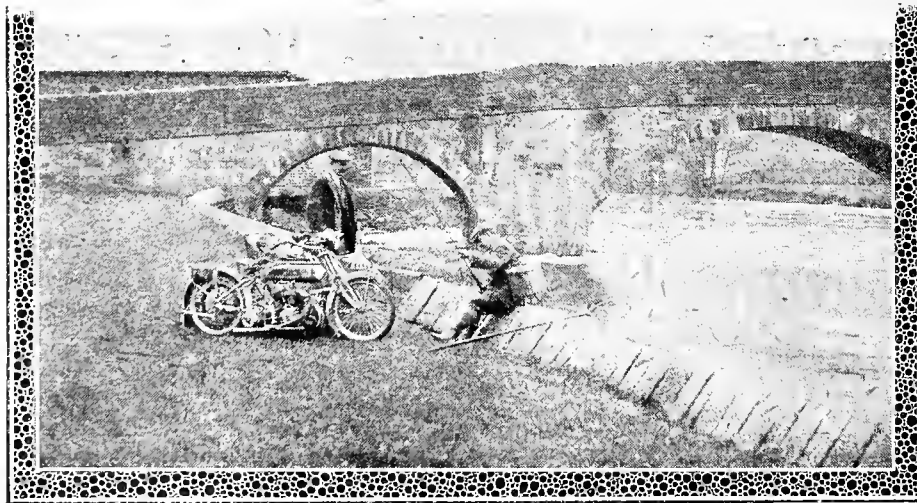
#### An Independent Pastime.

What seems to me a great point about angling is the degree of independence it affords. On most trout rivers a good deal of energy is necessary if one is out to get fish, but the man who desires to slack it can do so without interfering in the least with the sport of his companions. If he sprawls on his back at midday and departs into oblivion till tea time, he is infinitely better company than the energetic soul who has fished his own allotted stretch by eleven and is poaching on his neighbour's water at exactly five minutes past.

My old friend Charles was the best hand at sprawling I ever came across. He had reduced it to a fine art. Charles is now in the trenches, patching up the wounded, and the only item of news his letters convey is that he still sleeps beautifully.

In the palmy days of peace Charles used to come snorting over from M— one or two days a week on his little two-stroke, and many new waters he and I were able to explore with the equipment packed aboard my sidecar.

One of these new waters was a moorland tarn which was reported to contain a gigantic breed of



Tackling up at the water's edge while receiving a few hints from the river keeper.

So far as the popularity of the motor cycle among anglers is concerned, every experienced fisherman knows that in most districts it has brought about quite a changed state of affairs. All sorts and conditions of anglers are now to be found on the streams which, four or five years ago, were visited only by the keenest of the fraternity, and for this the motor and the tele-

**Angling Anecdotes and a Motor Cycle.—**

trout. We arrived one sweltering August morning after miles of mountaineering, but only to find fly fishing out of the question owing to the absence of a breeze. After lunch Charles stated that he was going to try for one or two of the big ones with a little bait, and, of course, we knew what that meant. When old Cram, the boatman, and I pushed off, Charles was sprawling on a headland, his hat over his eyes, while his float reclined on the glassy surface just beyond the weeds.

A brilliant idea for enlivening the proceedings suddenly occurred to me. Obtaining a ball of strong string from the boathouse and a fair size stone from the beach, we secured the stone to C.'s line and the end of the string to the stone; then we rowed to the

the cobwebs of the boathouse window. His bellows of mirth almost gave the show away. After several hard yanks I began to haul in, hand over hand, literally dragging poor old Charles into the lake step by step. Soon he began to shout feverishly, but I was too busy with the two-stroke to hear him.



(Inset)

READY FOR  
ROAD AND  
RIVER.

Note rod-carrier attached to front forks of 1915 P. and M. A sketch on the next page shows this in detail. The complete rig-out of the rider will be noted.



WINTER ANGLING A famous grayling lay on the river Wharfe, Yorkshire.

opposite bank where our machines reclined, paying out cord as we went.

**A Thrilling Five Minutes.**

The rest was simple. Holding the string in one hand I started up C.'s little two-stroke as though making an adjustment, and, as its infantile roar stabbed the moorland stillness, Charles sat up and promptly discovered that his float was missing. I gave the cord a jerk, and out of the corner of my eye I saw Charles scramble up and strike savagely. Got him!

I watched the pantomime over the vibrating engine of the two-stroke, whilst Cram watched it through

Fortunately it was the gut cast which finally parted. Hastily I cut the string, then leisurely stopped the engine.

"You blighted idiot!" bellowed Charles, up to the hocks among the rushes. "Are you deaf?"

"What's up?" I enquired mildly. "Paddling?"

We will not pain the reader with C.'s description of that fish. When I state the "facts" that he saw it, and that it was about 6ft. long, the sympathetic will understand, though these facts were nearer the truth than C. ever dreamt. But the most painful part of the whole business is that, during the next few weeks, several other anglers described how they had hooked the same fish, and were able to bear out

### Angling Anecdotes and a Motor Cycle.

C.'s statements as to its size. The tarn became quite popular, and many a silver crown old Cram earned as a result of keeping his promise to me never to breathe a word.

The following winter I was round the same sheet of water after snipe, and, calling at old Cram's house, happened to observe: "Cram, I don't believe there are a dozen fish in the whole lake."

"There aren't," Cram agreed unblushingly. "Between you and me, Mr. B., old Tom Newbert turned his sheep dip into the beck six months before you was up, and killed every bloomin' fish! We raked them out with a hay rake, though nothing was said, or Tom would have been fined. That is between you and me, mind you! Two bloomin' cartloads of 'em!"

It was a memorable day for all of us. How the scent of the wet peat squelching under one's boots, the mournful piping of the curlews, and the hiss of the grasshoppers linger in one's mind! That day, indeed, when Charles and I fished a lake devoid of fish—the long upland climb with high expectations, the swift return in the cool of the evening with empty baskets but light hearts, the final drop to the highway, where the dust had settled and the sweet scents of dusk were abroad across the lowlands—will live longer in our memories than many a long-planned visit to some recognised angling resort. And this only goes to prove that the actual taking of fish is of minor importance in the sport of angling.

### Necessary Equipment.

For anything on the lines of an angling tour a sidecar is, of course, desirable, but in these days few of us have time or inclination for touring. A sprint to some favourite water and back is the best we can manage, and for this kind of work a solo machine fills the bill perfectly. It is usually possible to leave one's tackle at the other end, and even if this cannot be arranged, the necessary equipment can be carried aboard if one goes the proper way about it.

One's creel (see sketch) should be provided with a tray, so that the fish occupy only the bottom portion, and it *must* be strong enough to sit down on.

Rods are not easy to carry on a solo machine, but a very simple carrier, which I have used for some years, can be made as shown in accompanying illustration. It is covered with American cloth or canvas, so that it somewhat resembles a golf bag, and is secured (1) at the front wheel spindle, and (2) at any other unsprung point of the front forks. If it can be fixed vertically in a sprung position, so much the better.

Another angling and motor cycling companion, who has many times caused me endless mirth, is a plump and cordial incumbent, known to his intimate friends

as the "Jovial Monk." The most memorable day was that on which the parson caught a little lamb. He was seated serenely by a favourite pool, slinging in quantities of ground bait (against the rules, by the way) when, on throwing his line behind him, his hook caught in something which turned out to be a sheep.

The sheep, of course, bolted, the parson in pursuit, and we watched him playing it across the pasture, much as one might play a big salmon.

After about ten minutes of this kind of thing the incumbent became tired, and tried to persuade the sheep to come to him—to nim-nim it, in his own words. But it happened that the sheep became tired of it at about the same time, and from a tame old ewe it suddenly evolved itself into an irritable old ram—a "beastly old buck" as the parson later described it. Back went its ears and down went its head. The parson had no time to slip aside. With a bellow he leapt straight into the air, his legs wide apart, and the ram passed under him.

It was really a most remarkable feat, worthy of a chamois. I should never have believed so fat a man could be so wonderfully agile. With proper training and suitably garbed, the parson would have made a toreador, but with a fishing rod in one hand, landing net in the other, huge boots, and a huge sun hat, he cut a most remarkable figure, leaping high into the air to evade his comparatively small opponent.

Twice the old ram charged, and twice the incumbent cleared it by at least two feet, then the beast quietly walked away, which was very fortunate, since the incumbent was becoming trussed up like a chrysalis in his own tackle. Needless to say, he did not pursue the argument as to which of them was to possess the hook, and that evening an amateur Bobby Burns who was with us immortalised the event in a song of his own, set to music of his own. The first verse and the chorus went as follow:

The Parson hooked a wee white lamb,  
That gambolled gaily by,  
But when the lamb turned out a ram  
The Parson jumped sky-high.

*Chorus.*

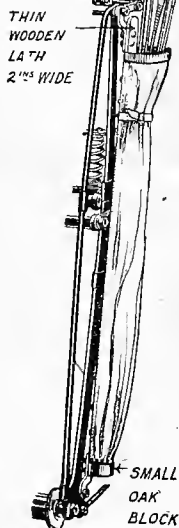
We know he's hooked a fish\* or two,  
And many a gay brown trout,  
But when he hooks an old buck ewe  
You ought to hear him shout.

\*Fish equals salmon.

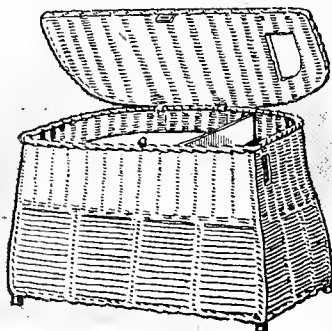
### The Gift of Driving.

The incumbent became a motor cyclist many years ago, but he is still, and always will be, a tyro. He is one of those beloved creatures who study hard at the anatomy of their machines, but who always allude to the change speed lever as the clutch and the tank as the tin. Its inner workings remain aloof from him, vague and incomprehensible as the skies.

Always he goes in for the most powerful sidecar outfit to be bought, but how is it that the incumbent, though he is not afraid of opening the throttle, can get no more out of his 7-9 h.p. twins than the average



A rod-carrier that can be attached vertically to the front forks of a motor cycle.



The most useful type of creel is provided with a hinged lid and bottom, and is fitted with a tray for tackle, etc.

**Angling Anecdotes and a Motor Cycle.—**

rider can get out of a 4 h.p. single? It opens up a rather interesting line of enquiry, for it is strange that a natural gift for mechanics should help one so considerably in the manipulation of the levers. At all events there is no doubt that the man who does not possess this gift can never obtain a reasonable response from his engine.

One day the incumbent and I were visiting a loch hidden in the heart of one of those gigantic Inverness-shire fir forests, and after many miles of deep ruts and swamps we came to a point at which the road divided. The parson swore we ought to turn left, and I swore we ought to turn right. After quite a heated

argument, we started up our respective engines and pursued our respective ways, each following his own views on the subject.

Less than eighty yards further on we met again, the roads once more converging into a single track, and there, just ahead of us, was the glittering sheet of water for which we searched.

So here's a toast: May the rough and rutty trail of to-day come to a sudden end; may we meet again unexpectedly after the long dispute, at our sides the faithful old jiggers that have served us well and uncomplainingly over the bumpy road, and which have carried us once more within sight of many a happy hunting ground.

## THE IMPORTANCE OF ACCESSIBILITY.



### Difficulties Encountered in Removing a Gear Box. By "Ixion."

**T**HE experience described below undoubtedly constitutes an extreme case, and is set out as a warning to the trade in general. Too many machines are designed and constructed in utter forgetfulness of the unfortunate user, who may have to take them to pieces against time with no other tools than those provided in the four-and-sixpenny roll sent out in the toolbag. It is hoped my recital may move one or two of the less thoughtful manufacturers to see how far ordinary tools are adequate for handling their standard machines.

The machine in question developed gear trouble at a distance of nearly 300 miles from its factory of origin. The exact nature of the trouble could not be diagnosed with certainty unless the gear box was removed and disassembled. It was, of course, possible to rail the entire machine to the works after transporting it six miles to the nearest station; but in the double interests of certainly saving money and possibly saving time, I decided to dismount the gear box for myself. The following special difficulties were encountered:

#### **Preliminary Troubles.**

(1.) Before any transmission item could be disturbed the magneto chain had to come off, as the magneto sprocket was outside a transmission sprocket on the engine shaft. The magneto sprocket was secured by a nut sunk in a recess; a very special tube spanner had to be made to unscrew this nut.

(2.) When this nut was removed the rear half of a chain case prevented the sprocket being sprung loose by levers; a special sprocket-drawing tool was essential.

(3.) A countershaft pulley was the next item for removal. Its nut was easily taken off, but the pulley was tight on its key and taper, and no wedges could be used, as a light metal chain case lay behind the pulley. A special pulley-drawing tool chanced to be available, but had to be softened and bent to a special

shape, owing to various items in the disposition of the pulley.

(4.) Two countershaft sprockets presented the next obstacles. Both were secured on splined shafts and locked by nicked rings and grub screws. Each had to be drawn off its splined shaft with a special sprocket drawing tool; and the tool employed for shifting the magneto sprocket was useless; finally, this tool was utilised in connection with two short lengths of chain ending in hooked links.

(5.) A transmission chain on the flywheel side could obviously never be replaced unless the flywheel was withdrawn, as the sprocket lay inside the flywheel and could neither be touched nor seen until the flywheel was off. The flywheel nut was easily withdrawn, but no wedges or levers could be used to shift the flywheel; fortunately it yielded to heavy hammer tapping on the crankshaft nut, though such usage is bad for the bushes and the thread.

#### **Another Delay.**

(6.) It now looked possible to dismount the gear box, provided its four nuts could be unscrewed. A special spanner had to be made to get at one of these nuts, after eleven various spanners of the correct jaw opening had been tried in vain.

(7.) But the next discovery was that the gear box could only be removed if the magneto were first taken clean off the machine, a process which incidentally implied the disassembling of a complex flexible wire control to the contact breaker.

The entire job occupied two skilled mechanics with an unusually large assortment of tools for a period of six hours. The bulk of the work would be necessary if one of the transmission chains had to be removed for replacement or a thorough cleaning. The work of reassemblage is likely to take quite as long. The yarn sounds incredible, but is literally true in all its details and indicates the gross carelessness of some designers in the matter of accessibility.



# A PLEA FOR THE FOUR-CYLINDER ENGINE.

Monobloc Aluminium Cylinder Casting with Steel Liners Recommended.

**A**T irregular intervals there appear in *The Motor Cycle* letters and articles on the subject of four-cylinder engines. The question of advantages and disadvantages is a vexed one, and people are apt to take sides on the matter rather violently without thoroughly examining the pros and cons. As one who views the matter with considerable interest and leans rather toward the adoption of multi-cylinder engines, I venture to put forward a few suggestions which may be worth consideration.

The beneficial effect of even torque on the wear of the transmission and tyres needs no discussion, and most readers will realise that even torque will mean rapid acceleration and great flexibility. Size for size, a four-cylinder engine will be infinitely superior to a single, or even a twin in these respects, a good horizontally-opposed twin being the nearest approach to the four-cylinder on account of its even torque and excellent balance.

The question of a multiplicity of small moving parts is usually raised against the "four," but few people seem to realise that a 1,000 c.c. four-cylinder engine would have a capacity per cylinder considerably in excess of many of our most successful small twins.

## Wearing Qualities.

As in motor cycle practice the stroke is seldom much greater than the bore, one might suggest 65 x 75 mm. as a suitable size for an 8-10 h.p. four-cylinder (capacity 996 c.c.). In all probability four cylinders will not be used for engines of less than 750 c.c., but even this size allows of a 60 mm. bore and a reasonable bore-stroke ratio. It will be remembered that many of our best light cars have a bore of no larger diameter, and the shortening of the stroke will not affect the size of moving parts other than beneficially. As a matter of fact, a four-cylinder engine should wear considerably better than a single or twin, as, apart from the question of steady impulse and absence of vibration, the four-cylinder design naturally lends itself to more reasonably proportioned bearing areas and improved lubrication. Improvements in these two points will to a certain extent do away with the necessity of constant tuning up, for which faulty lubrication is largely responsible.

The idea that a four-cylinder engine will have tiny valves which will give endless trouble is pure fallacy. A well-designed high-speed engine of 65 mm. bore will have a clear valve port somewhere in the neighbourhood of 32 mm. diameter, or roughly  $1\frac{5}{16}$  in., over the head. This is almost as large as the valves of the average  $3\frac{1}{2}$  h.p. single, so there should be no trouble on this score, especially as the lift would be comparatively small.

There remains the question of cooling, and this is simpler than it would seem at first sight. I would suggest an aluminium cylinder casting (possibly *monobloc*), and aluminium pistons working in thin steel liners. The *monobloc* casting certainly provides work for the foundryman, but if a detachable head is included in the design it is well within the bounds of possibility, and the cooling of the cylinders would be evened up and improved by long continuous ribs. While on the subject of metals, I would like to remind sceptical readers that this talk of aluminium for air-cooled cylinders and pistons, which has of late cropped up so frequently in the pages of *The Motor Cycle*, is not the idle talk of theorists, but a very sound and practical proposition, and I venture to prophesy that in a short time aluminium cylinders and pistons will be the rule and not the exception for motor cycles. The ensuing reduction in weight would be comparatively slight, but the improvement in cooling would be most important.

To return to the four-cylinder engine. It is long and is not easily disposed of in the present type of motor cycle frame. But have we reached finality in frame design? I think not by a long chalk.

## How the Cylinders may be Placed.

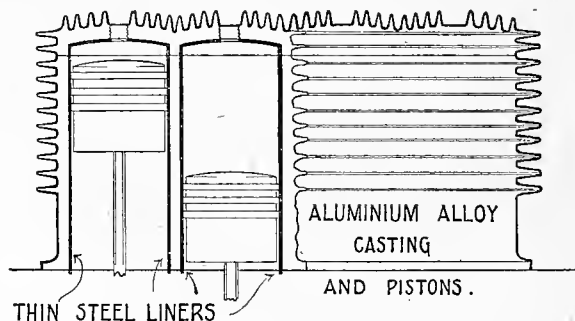
It is well to remember that to place the cylinders vertically in line is not the only possible arrangement

for a multi-cylinder engine. Leaving out the question of rotary engines, which do not seem easily adaptable to motor cycles, a four-cylinder horizontally-opposed engine, which would be lighter, cheaper, and more compact than the vertical type, is well within the power of our designers. A four-cylinder V-type engine was (and still is in car form) produced by a famous French firm, but both balance and even torque suffer in this design, though with care the difference can be made almost negligible.

Multi-cylinder engines must always be comparatively expensive to buy, and perhaps I shall be strafed for advocating a luxury campaign in these days. Yet there will always be a class who will buy the best, and this class is likely to be augmented in the near future by a number of car owners who can no longer afford the upkeep of a four-wheeler.

It is many years since I had my first ride on a four-cylinder "Binks," and many things have happened since those days. Magnetos, for instance, have removed one of the (then) difficulties in the way of four-cylinder motor cycles. I take my hat off to the modern F.N., the Henderson, and T.M.C., and in conclusion, to those who have not ridden a modern powerful four-cylinder I offer this advice. Try one!

UBIQUE.



Suggested design by "Ubique," writer of accompanying article, for a four-cylinder monobloc motor cycle engine.



## WOMEN MOTOR CYCLISTS ON THE LAND

### ANOTHER USEFUL WAR-TIME OCCUPATION FOR LADIES.

"**B**ACK to the land" is by no means a new cry, and, now the Forces are claiming the last eligible men from town and countryside, woman naturally is called upon to do all that she can to assist in the cultivation of crops. Two branches of farmwork that are especially practicable for women as giving both pleasure and profit are fruit and poultry farming. Situated in Mid-Herts are two such farms worked by enthusiastic lady motor cyclists. Mrs. Robb, an experienced rider of a 3½ h.p. Triumph, is a mistress of the intricacies of fruit and flower growing as well as of motor cycling. She is quite accustomed to taking long journeys on her machine, and the only drawback to her trusty Triumph that she finds is the height of the frame. This does not allow her to stand astride the machine when stopped by traffic. She wears an ordinary tweed skirt buttoned up the front, and considers the skirtless dresses advocated

is a work, too, that necessitates early rising, but is a most interesting and healthy occupation nevertheless. Attached to Mrs. Robb's fruit farm is a paddock containing about a hundred white leghorns. These were so nervous at the appearance of the camera that only a few of them remained to be photographed.

Miss Winifred Dunn is the other woman fruit farmer, one of a motoring family who has sampled many makes and whose stud comprises Douglas, Rudge, A.J.S. and a U. and I. sidcar, besides cars.

Miss W. Dunn pruning:

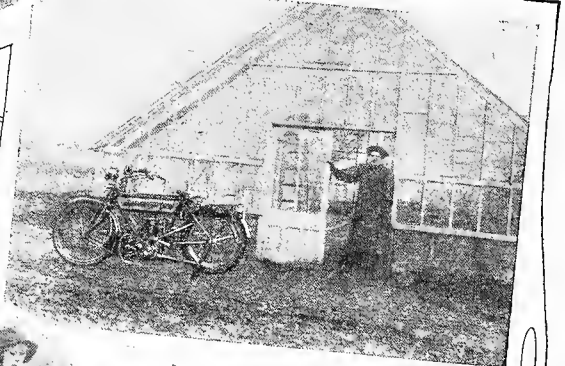


Miss Dunn's preference in a solo machine leans towards the Douglas, whilst for wet weather or carrying a passenger, she is quite enthusiastic about the U. and I. This young lady has five acres of fruit trees, chiefly apples, that she tends herself entirely.

The trees are the cordon variety, and when one observes the appearance of the gardens, with vegetables planted between the trees, and thinks of the time utilised every day in pruning,



Poultry feeding.



Mrs. R. Robb arrives on her Triumph at one of the greenhouses under her charge.

by some to be unnecessary. A small hat, long coat, and thick gloves constitute Mrs. Robb's motoring wardrobe.

One fact that this rider regrets is that the nice days of summer are those when the fruit claims one's closest attention; there is no spare time for tours of any length. It



Workmanlike costume worn by Miss Dunn when at work in her gardens.

digging, and clearing the ground, one feels that yet another female motor cyclist is "making good."

The garb chosen from experience by Miss Dunn, as one which is beyond improvement, can be seen in the illustrations. It is made of brown corded velvet with straps

**Women Motor Cyclists on the Land.—**

over the shoulders, and has a spacious patch pocket to contain a pruning knife and the storehouse key. At the skirt hem is a band of soft brown leather about 5in. or 6in. wide. The wearer thus escapes the discomfort of a soaked hem in wet weather. Then, below, workmanlike boots and leggings. It is as useless to try to work in unsuitable clothing as for the

lady motor cyclist to dress in the "about town" style when driving a machine.

These practical folk are highly amused at the illustrations published in the daily pictorial press of the woman farmhand in the spotless white linen apron. The apron would in a very short time lose all claim to cleanliness.

MAY WALKER.

**UNDER CANVAS AGAIN.**

With the coming of spring camps are springing up throughout the country, and the despatch riders in training are delighted to live under canvas. The photograph shows the dinner hour at an R.E. despatch riders' training centre.

**A VALUABLE PASTIME.**

The Advantage of a Smattering of Mechanical Knowledge.

**T**HERE is no doubt that the pastime of motor cycling has done much in adding to the general efficiency of the young men of this generation. Quite a small percentage of those serving with the Colours are motor cyclists in the sense that they have owned machines, but many thousands have been deeply interested in the pastime, and have possessed friends in whose mounts they have taken an interest.

In most cases this interest has been of no idle kind, and many youths whose friends or brothers own motor cycles have picked up for themselves the working of the machine, and learnt to effect ordinary running repairs. Such experience is invaluable, in that it creates an interest in mechanical things, and teaches one to sort out the why and the wherefore; whereas without any such experience, the average youth is quite content to regard machinery as beyond him.

There is no doubt that the youth with some mechanical knowledge, even though only a smattering, is calculated to prove more valuable as a soldier than those whose experience of such matters is of the tack and hammer variety, and this was particularly brought before my notice during a recent chat with a young

motor cyclist who, in charge of a machine gun, has seen much service since the outbreak of war. "My companions and I," he explained, "were interested in our gun simply because it was a machine, and but for our experience as motor cyclists, I don't suppose we should have had any particular affection for machinery. We had learnt as motor cyclists to set things right, and not to give up hope simply because some minor part had temporarily struck work." When stranded on a wet night, for instance, with a saturated high-tension wire, one has either to locate the trouble or suffer the discomfort of having to push.

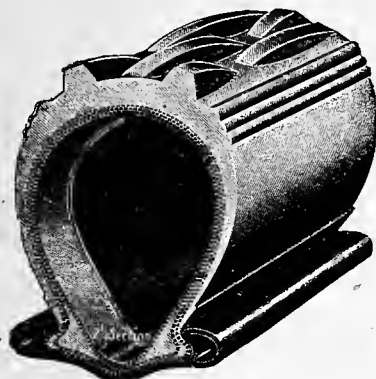
The same thing applies out there, where one does not usually have to search far for trouble. The modern machine gun, though wonderfully reliable, requires a good deal of attention, and one's experience as a motor cyclist comes in useful when called upon to locate the cause of a temporary breakdown in the dark, and when the Huns are coming on in masses.

In such cases much may depend upon one's mechanical aptitude, and the motor cycle soon teaches one to put two and two together and carry out repairs more rapidly.

H.M.B.

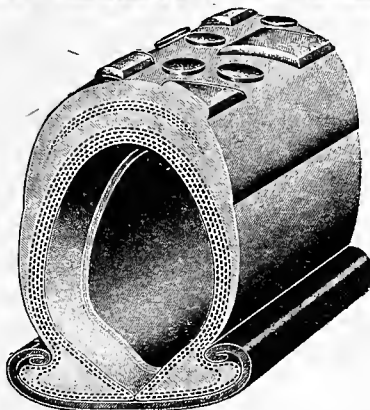
# TYRE ECONOMY

## SPECIAL CLEARANCE LINES (Discount allowed to the Trade.)

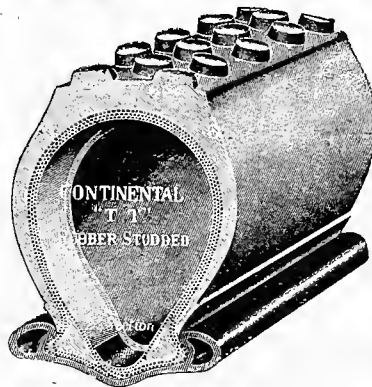


Continental Basket Pattern.

26 x 2 1/4 .. 14/6 List Price 26/6.

Continental Combination.  
(Specially constructed for rear wheel of heavy sidecar outfits.)

28/- List Price 54/- 26 x 2 1/2 only



Continental T.T. Studded Heavy.

26 x 2 1/4 .. 21/6. List Price 34/-

### COVERS.

CONTINENTAL.	Our Price.	List Price.
26 x 1 1/2 Standard .....	9/-	12/6
26 x 2 " .....	10/6	19/6
26 x 2 1/2 " .....	14/6	23/9
28 x 2 1/2 " .....	15/-	25/-
28 x 2 1/2 " .....	17/6	27/6
26 x 2 1/2 Standard, wired-on .....	10/-	25/-
26 x 2 1/2 Model de Course .....	18/6	33/3
28 x 2 1/2 " .....	18/-	34/-
26 x 2 1/2 Lightweight T.T., basket pat. .....	12/6	21/-
26 x 2 1/2 T.T., basket pattern .....	15/-	22/3
26 x 2 1/2 " .....	15/-	26/6
26 x 2 1/2 " .....	17/6	28/-
26 x 2 1/2 " .....	21/6	28/9
26 x 3 for 2 1/2 " .....	22/6	37/9
28 x 3 " .....	30/-	41/3
26 x 2 1/2 " .....	21/6	34/-
26 x 2 1/2 " .....	26/6	37/6
26 x 2 1/2 " .....	27/-	37/6
26 x 2 1/2 Combination .....	29/6	54/-
650 x 65 Autobi .....	22/-	39/6
650 x 65 Fluted pattern .....	19/6	28/-
650 x 75 or 700 x 80 Autobi rubber-studded .....	31/6	44/3

650 x 65 Heavy Fluted 19/- 33/-

### CLINCHER.

24 x 2 De Luxe Heavy Cover (with tube complete) .....	13/6	25/6
26 x 2 1/2 De Luxe .....	21/-	32/-
26 x 2 1/2 " .....	23/6	36/3
28 x 3 " .....	35/-	48/6
26 x 2 1/2 for 2 1/2 De Luxe, wired-on .....	21/-	37/6
26 x 2 1/2 Dreadnought .....	27/6	40/-

### RETRADING.

Special Heavy, 15/-; Heavy, 12/6; Medium 10/-; Studded or Ribbed Retreads.

Sections on application.

TIME REQUIRED, 3 DAYS FROM RECEIPT OF COVER.

We offer a 3/- Outfit free of charge to all purchasers of goods to the value of £1 and over.

ALL MAKES OF TYRES IN STOCK.

All goods sent on seven days' approval against remittance. Carriage forward, unless postage is sent.

### COVERS.

	Our Price.	List Price.
26 x 2 1/2 x 2 1/2 Dreadnought .....	32/6	40/-
26 x 2 1/2 A Won, rubber-studded ..	21/-	32/-
26 x 2 1/2 " .....	22/6	32/-
26 x 2 1/2 " .....	14/6	27/6
26 x 2 1/2 B quality, rubber-studded ..	13/6	26/6
650 x 65 Fluted .....	21/-	30/6

### KEMPSHALL.

26 x 2 1/2 Heavy non-skid .....	25/-	42/-
28 x 3 " .....	45/-	70/-
26 x 2 1/2 " anti-skid .....	22/6	32/6
28 x 3 " .....	25/-	57/6

### WOOD-MILNE.

26 x 2 Grip-ribbed, heavy .....	15/9	26/9
26 x 2 1/2 Combination, heavy .....	30/-	42/-
26 x 2 1/2 " extra heavy .....	35/-	48/6
26 x 2 Grip-ribbed, extra heavy .....	20/-	32/6
26 x 2 Combination, heavy .....	25/-	39/-
26 x 2 " extra heavy .....	30/-	45/-
26 x 2 1/2 Grip-ribbed, heavy .....	17/6	29/-
26 x 2 1/2 " extra heavy .....	22/6	36/-
26 x 2 1/2 " heavy .....	21/-	30/6
26 x 2 1/2 " extra heavy .....	26/-	37/3
26 x 2 1/2 Combination, heavy .....	32/6	45/-
26 x 2 1/2 " extra heavy .....	37/6	52/6
26 x 2 1/2 " heavy .....	35/-	48/-
26 x 2 1/2 " extra heavy .....	40/-	56/6
26 x 2 1/2 Grip-ribbed, heavy .....	22/6	32/9
26 x 2 1/2 " extra heavy .....	27/6	40/-
26 x 3 " heavy .....	25/-	36/6
26 x 3 " extra heavy .....	30/-	44/-
28 x 2 " heavy .....	17/6	30/6
28 x 2 " extra heavy .....	22/6	37/-
26 x 2 1/2 " heavy .....	22/6	21/9
28 x 2 1/2 " extra heavy .....	27/6	39/-

### COVERS.

AVON.	Our Price.	List Price.
26 x 2 1/2 rubber-studded .....	14/6	20/6
26 x 2 1/2 Tricar .....	27/6	38/6

### TUBES.

#### CONTINENTAL.

	Our Price.	List Price.
26 x 1 1/2 .....	4/-	6/6
26 x 2 .....	4/3	7/3
26 x 2 1/2 .....	4/9	7/9
26 x 2 1/2 .....	5/3	8/6
26 x 2 1/2 .....	5/3	8/9
26 x 2 1/2 x 2 1/2 .....	5/9	8/9
650 x 65 .....	5/6	11/6
650 x 75 or 700 x 80 .....	6/-	14/-
24 x 2 .....	4/8	8/6
28 x 2 1/2 .....	7/-	10/6
28 x 3 .....	7/3	12/6

Butted, 1/- extra.

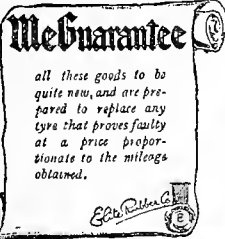
### BELTS.

#### CONTINENTAL.

	Our Price.	List Price.
1 in. section .....	1/3	2/2
1 1/2 in. " .....	1/-	1/11

#### CLINCHER FLEXIS.

	Per foot.
1 1/2 in. section (8ft. 6in. lengths only) .....	1/6 2/6
1 in. " (7ft. 4in. and 7ft. lengths) .....	1/3 2/1
1 1/2 in. " (7ft. & 7ft. 4in. lengths) .....	1/- 1/9 1/2
2 in. " (7ft. & 7ft. 4in. lengths) .....	-/11 1/6



all these goods to be quite new, and are prepared to replace any tyre that proves faulty at a price proportionate to the mileage obtained.

Edith Roberts



These treads when fitted make the cover equal to the heaviest cover manufactured.



These treads when fitted make the cover equal to the heaviest cover manufactured.

# ELITE RUBBER Co., Ltd.,

266, Vauxhall Bridge Rd., Victoria, S.W.

Phone: Victoria 6553.

One Minute Victoria Station.

In answering this advertisement it is desirable to mention "The Motor Cycle."



# "Heads or Tails."

Headlight or Rear, the Lamp you fit to-day **MUST** be beyond reproach. And Headlight or Rear, the **SUREST** way to Safety is to always

## Ask for 'P & H'

To risk it doesn't pay—there's far too much at stake—and though you're buying "but a Lamp" it's wiser far to choose the Best—the Reliable 'P & H.'

Your Agent stocks 'P & H' models, just ask him—or us for Catalogue.

**POWELL & HANMER, LTD.,**  
CHESTER STREET - - BIRMINGHAM.



E.H.B.



ALWAYS CARRY A

# Mustikon

"MUST-STICK-ON"

TUBE REPAIR  
OUTFIT

and your tubes may last as long as your motor cycle. This is why. Every puncture or burst repaired with a Mustikon Rubber Stud is a **permanent** repair. More than that, the Stud—since it means **INSIDE, MIDDLE, and OUTSIDE**—actually **strengthens** the tube. Unlike patches, a Mustikon Stud **cannot leak, creep, or blow out**, and cannot perish the tube as vulcanising does. It needs only your hands, a few minutes, and a Mustikon Stud to repair anything from a pinhole to a 2 in. burst. Tell your repairer to 'Put in a Mustikon.' Don't let him spoil your tube with patches and vulcanising.

Obtainable from most dealers, or direct from

**MUSTIKON, LTD.,**  
23, NEW ST., CARDIFF.

MOTOR  
CYCLE  
OUTFITS  
5/9 & 3/-.

## Apollo

THE APOLLO MOTOR  
CYCLE PLUG, Mark "S,"  
is absolutely reliable in use.



Perfect gastightness under heavy compression, no misfiring, combined Mica and Porcelain insulation.

Note.—Each Plug is individually tested before leaving the Works, and marked by the tester.

**British Made Throughout.**

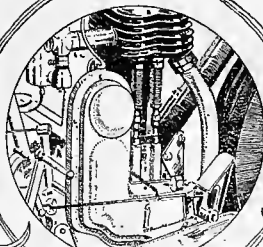
Don't be buying Plugs continually—have the best—Apollo Plugs will please you.

Price **3/6** each.

Of all dealers, or direct from the Manufacturers:

**APOLLO MFG. CO.,**  
Apollo Works,  
BIRMINGHAM.

# QUESTIONS AND REPLIES



## Running on Acetylene Gas.

**[?]** Could you inform me if I should run any risk to myself or motor cycle by using acetylene gas for running?—J.W.

You would have great difficulty in fitting up an installation for running on acetylene gas. The explosion of this gas is very violent, being almost a detonation, and unless the engine was specially constructed to withstand these violent explosions, very serious damage might result.

## Erratic Running of Engine.

**[?]** I should be glad if you could assist me in locating the fault in my motor cycle. The machine will run on the stand for a minute or two, but then suddenly ceases to fire. I have checked the valve timing, which is correct; exhaust closes on top of stroke, inlet opens just after exhaust closes, each valve remains open one stroke of piston. I have cleaned carburetter, petrol pipe, and jet; these are quite clear. I get a regular spark at the plug points when the plug is placed on cylinder top and engine pedalled round. The spark is timed with piston on top dead centre, contact breaker nearly fully retarded. I have had the magneto to pieces and thoroughly cleaned it. The trouble commenced when on the road with the firing suddenly ceasing. Upon examination, I found that the insulation bush through which the central screw of the contact breaker passes was broken. I had this replaced, but am quite unable to get continuous running. I have tried different plugs, but after the minute or so running the engine stops. Could it be internal trouble in magneto?—T.G.

It is just possible that your trouble is caused by a broken wire connection in the armature of the magneto, though it is not a very likely cause of the trouble. The symptom rather points to shortage of petrol, perhaps due to partial stoppage of one of the carburetter passages. Make sure that there are no air leaks between the carburetter and the engine. Similar trouble to this is sometimes caused through air locks in the petrol tank, owing to there not being any means provided for air to enter. Make sure the rocker arm of the contact breaker is not sticking. If you suspect that the magneto is at fault we would advise you to send it to some firm of magneto specialists.

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Shocks from Magneto.

**[?]** (1.) In the case of a car or motor bicycle the return circuit is formed through the frame of the machine itself, the gap at the plug points being the only interruption, and, moreover, all this circuit is insulated from the ground completely, or—nearly so, by the tyres. Why is it that while standing on the ground no shock is experienced when touching any part of the machine forming this circuit except from that part alone between the magneto and plug terminal? (2.) What are the respective voltages of the primary and secondary windings of a magneto at ordinary engine speeds?—J.B.

(1.) The reason that a shock is experienced if the high-tension terminal is touched, and yet if the frame, which forms the return circuit, is touched no shock is experienced, is that, owing to the resistance caused by the spark gap of the plug, the current, or a large portion of it, taking the easier path, passes through the person who touches the plug terminal, and so a shock is felt. If, however, the ground and tyres of the machine are dry, so as to form complete insulation between the person and machine, and the plug terminal only is touched, the shock then received is so slight as to be almost unnoticeable. The reason that no shock is received from the frame is that this offers such a large path for the return current that it is easier for the current simply to pass directly back to the magneto, so that no shock is felt. (2.) The primary current is roughly four to six volts, while the induced, or high-tension, current is roughly anything from 4,000 to 10,000 volts. It is usually taken that for each inch of high-tension spark 25,000 volts are required.

## Reversing an Engine.

**[?]** Is there any objection or harm done in reversing the running of engine and magneto? The engine is a 7 h.p. a.o.i.v. twin. Exhaust valve cam is exactly the same shape on both sides. The magneto is a Bosch.—H.J.B.

If your valve cam is exactly the same both sides you will be able to reverse the running by merely altering the timing so that the exhaust valve is open on what is at present either the firing or induction stroke, but in the case of the magneto you would need a new contact breaker.

## Warming the Carburetter.

**[?]** I use an 8 h.p. Matchless, and am thinking of fitting a hot air chamber to the carburetter for use with paraffin. (1.) Will you be good enough to inform me if it is necessary or advisable to place a gauze in the pipe from the exhaust in order to prevent any carbon or other impurities from entering the carburetter from the exhaust? (2.) Is there any danger in heating the carburetter by this means through the possibility of flame (such as sometimes comes from the silencer) igniting the spirit in the carburetter, or would there be any fear of spirit dripping down through the heating pipe into the exhaust pipe or silencer? (3.) Would it be better to connect up the silencer direct with the carburetter, or to drill a hole in the exhaust pipe and connect from there, and in the latter case, does it matter how far down from the cylinder this hole should be drilled?—R.A.

(1.) If you have a hot air chamber with a good sized outlet we do not think you will need any gauze in the pipe, as this would be likely to become obstructed, whereas if there is no gauze the deposit will form very gradually, and the chamber should go for a long time without needing cleaning. (2.) There is no danger in heating the carburetter by this means, especially if the chamber is properly made, and there is no connection between it and the carburetter itself. What you want to do is to heat the vaporising chamber. (3.) You connect your pipe to the heating chamber by any convenient means. It does not matter whether the connection is in the exhaust pipe or near the cylinders. It would be better, however, in the exhaust pipe, fairly near the exit from the cylinder, as the gas would not then have lost very much of its heat.

## PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always having their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

### Law relating to Cut-outs.

**?** Would you be good enough to give me through your columns a reading of the regulations which now prevail in England relating to exhaust boxes and cut-outs? The local law is unfortunately interpreted in such a way by the magistrates that the alleged offender stands no chance, with the result that a conviction is the invariable result. Our law reads: "Every motor vehicle shall be provided with an efficient silencer, and the silencer shall be in operation within the area of a local authority."—D.H. (Pretoria).

In England every motor cycle must be fitted with a silencer or expansion chamber suitable and sufficient for reducing, as far as possible, the noise of exhaust gases. It is made illegal to use any cut-out or other contrivance which would allow the gases to escape without first passing through such silencer or expansion chamber. In addition to this, however, the police can, under the common law, take proceedings against any rider whose machine, in the opinion of a police constable, is making more noise than is necessary.

### Running on Paraffin.

**?** In view of the high cost of petrol, I am trying to arrange a method of running my 4 h.p. A.J.S. and sidcar outfit on paraffin, and should be greatly obliged for your kind advice in this matter. My present carburetter is of the Amac multiple jet type, and with petrol I can get excellent results with a No. 26 jet and a consumption of 60-65 m.p.g. (1.) What is the greatest proportion of paraffin it is possible to mix with petrol and still get good results without the engine overheating, using petrol for starting? (2.) When using paraffin, is it advisable to use a smaller jet and weight the float? (3.) Would it be possible to run on paraffin alone if I connected a piece of flexible metallic tubing (as used for steam) of same bore as the exhaust pipe, and coiled it round the carburetter mixing chamber so that the latter is kept hot by the exhaust? (4.) With either of the above arrangements, is there liability to serious overheating of the engine if it is not forced? On one occasion I used a common grade of benzole without lowering the petrol level, as it did not seem necessary, the result being serious overheating.—J.W.R.

(1.) Fifty per cent. paraffin is about the greatest proportion with which reasonably good results can be obtained. (2.) We do not think you will find it necessary to reduce the size of the jet for this mixture. (3.) Yes; it is possible to run on paraffin alone, provided ample heating of the carburetter is arranged for, but the engine would run very hot, showing a very great tendency to knock, and would need cleaning out very frequently. We think you would get sufficient heat to warm the carburetter adequately if a by-pass of copper tube, say about  $\frac{1}{2}$  in. bore, were taken from the exhaust pipe and bound around the induction pipe and spray chamber of the carburetter, the other end then being conducted to the silencer. We think you would have difficulty in conducting the whole of the

exhaust gases to heat the carburetter, as you suggest. In addition to the heating apparatus suggested, we would advise you to draw all the main air for the carburetter from a point situated close to the exhaust pipe or cylinder, or from a special heating chamber fitted around the exhaust pipe. (4.) If you run on paraffin alone you would certainly find a considerable difference in the running heat of the engine, and it will be necessary to clean the latter out frequently. If your engine showed serious signs of overheating on benzole it will most certainly be more liable to do so on paraffin. To run on pure paraffin it will be necessary to start on petrol; then, when the engine is hot, the paraffin can take its place. It is possible to start on a half-and-half mixture

### Lack of Power.

**?** I have bought a 1914 second-hand lightweight fitted with a U.H. magneto and B. and B. carburetter. I have taken the engine down and ground the valves in, and I found every working part in perfect condition, but now I have put it all back the engine will run, but will not pull. I thought it must be my carburetter, but I borrowed one of the same make from a friend, but it gave no better results. The timing, I think, is correct; the exhaust valve closed just before the induction stroke, and I have timed it to fire when the piston is at the top of the compression stroke. It has fixed ignition.—E.S.

We should say that if you run the engine it will improve after a short time when the parts are run in. The spark timing seems rather late; try advancing it one tooth. Be sure that the valve caps are tight and that the compression is not leaking, also that the tappet clearance is correct.



An officer in British East Africa who, according to the message with the picture, "is enjoying his favourite paper, *The Motor Cycle*."

### Loss of Power.

**?** My machine is a  $3\frac{1}{2}$  h.p. Fafnir, fitted with an automatic inlet valve, B. and B. carburetter, jet 36, magneto ignition (Bosch), and a Roc two-speed gear—54 to 1 and 11 to 1. I get started well on low gear, and when I change into high the engine will not pick up. If I get a good start down a hill it will run well on the level on top, but coming to a slight hill it will commence to knock, and finally stop, whether I retard the spark or not. I can drive on full air no matter where the throttle is; if I use a smaller jet it misses fire. The spark seems good, and the compression is excellent. The inlet valve opens about  $\frac{3}{8}$  in., and when out of the engine I can open it with a jerk of the hand. The exhaust valve closes when the piston is at the top. The engine is free from carbon deposit, as it was recently cleaned. Would you please give me any information that might lead to the discovery of my trouble?—W.J.L.

It looks as though either the carburetter or inlet valve is at fault. You should not be able to give full air at all speeds. This indicates that you are getting too rich a mixture, which may be due to too large a jet, too wide a valve opening, or too weak an inlet valve spring. When testing the spring by jerking it on the hand it should not open easily. It should only be possible to open it slightly with a fairly hard jerk;  $\frac{1}{16}$  in. or  $\frac{3}{32}$  in. opening should be sufficient. A 32 jet should be about right. The carburetter should be adjusted so that rather more air than throttle opening is given at moderate speeds; but it should be possible to upset the firing by opening the air fully, except, perhaps, at full throttle. See that your magneto contact points are adjusted correctly, separating .4 mm., and that the rocker is not sticking. Make sure you are lubricating sufficiently.

### RECOMMENDED ROUTES.

#### SALISBURY TO LEICESTER.—F.C.C.

Salisbury, Andover, Newbury, Abingdon, Oxford, Banbury, Byfield, Daventry, Lutterworth, Leicester.

#### CAMBRIDGE TO READING.—A.C.

Cambridge, Royston, Baldock, Hitchin, Hatfield, St. Albans, Watford, Rickmansworth, Denham, Slough, Maidenhead, Reading.

#### SUNDERLAND TO BOLTON.—J.S.

Sunderland, Durham, Bishop Auckland, Staindrop, Barnard Castle, Bowes, Brough, Kirkby Stephen, Sedburgh, Kirkby Lonsdale, Lancaster, Preston, Chorley, Bolton.

#### GRIMSBY TO ST. ALBANS.—R.C.F.

Grimsby, Louth, Horncastle, Spalding, Peterborough, Alconbury Hill, Eaton Socon, Biggleswade, Hitchin, Codicote, Wheathampstead, St. Albans.

#### ST. ALBANS TO ROCHESTER.—R.C.F.

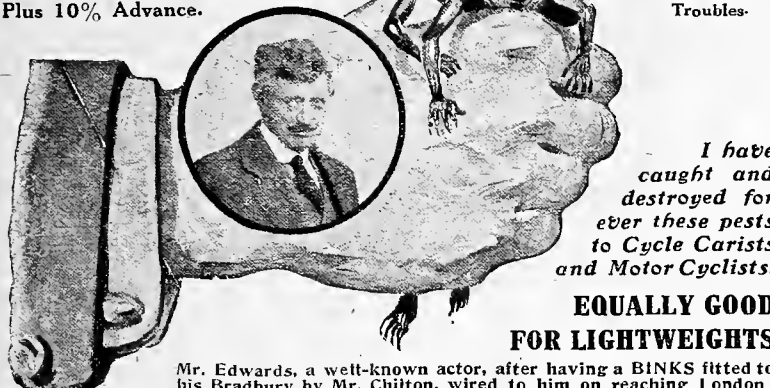
St. Albans, Hatfield, Hertford, Ware, Harlow, Ongar, Brentwood, Orsett, Tilbury, by ferry to Gravesend, Stroud Rochester.

# STARTLING IMPROVEMENT IN CARBURETTERS.

## The BINKS 1916 Automatic Jet Damping Pilot Jet Carburetter

"Heavy Petrol Consumption"  
 "Inflexibility"  
 "Won't run slow"

PRICE, 49/- WITH  
 SPARE JETS, KEY,  
 AND INSTRUCTIONS.  
 Plus 10% Advance.



Free advice  
 on all  
 Carburation  
 Troubles.

*I have  
 caught and  
 destroyed for  
 ever these pests  
 to Cycle Carists  
 and Motor Cyclists.*

**EQUALLY GOOD  
 FOR LIGHTWEIGHTS**

Mr. Edwards, a well-known actor, after having a BINKS fitted to his Bradbury by Mr. Chilton, wired to him on reaching London: GOD BLESS BINKS. A unique testimonial.

### One lever control

For all ordinary riding  
 especially in Traffic.

### Extra air lever

is there if you fancy it.

You can shut throttle and jets off  
 down hill and open air lever and  
 scavenge your engine with

**COOL, CLEAN AIR,**  
 and obtain good air brake.

You cannot do this with any other.

The results given by this new and wonderful instrument have to be seen by most to be believed. No other carburetter can approach it for slow running and flexibility and utmost speed, and it is by far the most economical carburetter in the world. Makes any engine tick over dead slow like a steam engine, and pull dead slow in traffic, and won't race when clutch is taken out, when running slow.

The **JET DAMPING SYSTEM**—The Secret of the extreme economy.  
 The **VARIABLE CHOKE TUBES**—The Secret of the marvellous flexibility.

## ON 3½ TRIUMPHS

AND ALL SIMILAR MACHINES

**150 MILES PER GALLON.**

**DEAD SLOW PULLING IN TRAFFIC,  
 JUST A TICK OVER WHEN FREE,  
 THE EXTREME LIMIT OF SPEED.**

## On 6 & 8 h.p. TWINS

WITH OR WITHOUT SIDECARS makes them run like small 4-cylinder cars (a remark actually made by a manufacturer on being shown a machine of this make fitted with a Binks). Revolutionizes the running and saves petrol and tyres.

Two of my competitors, who have up to now decried the pilot jet as unnecessary, are now adopting it, but the important point for you to consider is that they are copying abandoned ideas of mine!! A pilot jet that cannot be controlled from the handle-bar is practically useless. For the sake of the extra small cost it will pay you to buy the genuine article.

**RACING** Remember that the fastest time ever done on a T.T. machine, over 81 miles per hour, was done by Mr. O'DONOVAN on a NORTON with a BINKS CARBURETTER.

Send for Lists and  
 Treatise on Carburation

**C. BINKS, LTD., PHOENIX WORKS, ECCLES, Nr. MANCHESTER.**

Small spare tank to clip on frame to hold petrol for easy starting, 2-way tap, and pipe 15/- plus 10% war advance. You start instantly on petrol and at once turn the 2-way tap on to the cheap fuel; you cannot tell you are not running on petrol at 2/6 a gallon. You should lose no time in adopting this system, which reduces your petrol bill to one half.

In answering this advertisement it is desirable to mention "The Motor Cycle."

B31

## On the SCOTT

This instrument practically makes this truly magnificent machine run with steam engine like flexibility, absolutely dead slow when free or in traffic, gives it the *easiest* start and the extreme speed possible, yet with less petrol consumption than any other, and does not race when clutch is taken out. I have hundreds of wonderful testimonials about my 1914 carburetter on Scotts, but the new instrument is a *startling improvement* on last year's, giving far slower running and 25% more mileage. Can be fitted to the Scott, when the old carburetter is removed, by a novice in half an hour, with a spanner only. Absolutely no alteration or work required. To enable you to *TEST* my claims, and compare this instrument with others, I will send you one on a week's approval and *TRIAL*, and if you do not like it I will return your money. The Scott set consists of Carburetter, 49/-, new petrol pipe, connecting stirrup, clamp, bracket, and engine shields, to make all look neat and workmanlike, 15/-.

READ LETTER in "THE MOTOR CYCLE" ON AUGUST 21, PAGE 1091, FROM R. F. G. KELLY, ESQ.

**Testimonial (quite unsolicited) from Rev. O. D. Bryce-Payne.**

C. Binks, Ltd., St. Christopher's, Sandwich, Kent, 23rd September, 1913.  
 Dear Sirs—I have just finished 500 miles with your latest pattern carburetter fitted to my Scott. First, with regard to the fitting—if accessibility counts for anything it is admirable. Your carburetter went on without any tool being needed beyond a small spanner. It is the most *delightful* instrument to use. In conjunction with a Scott, traffic, originally a nightmare with a one-jet carburetter (automatic), which needed the united control of both hands and both feet, has no terrors, I can safely say, with a Binks two-jet. The extra air lever as a brake is especially useful.

Yours sincerely, O. D. BRUCE-PAYNE.

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SOME NOTES ON FAN DYNAMOMETERS.  
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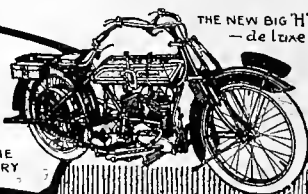
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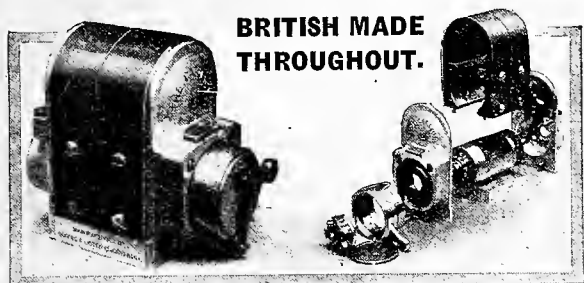
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All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

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## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### Abingdon.

**A** BINGDON King Dick Canoelet Combination, 1915, 5-6h.p., 3 speeds, in first-rate condition: £48.—Joho Alison, Dalkeith, Midlothian. [X6616]

### A.J.S.

**A** J.S., 1916; all models in stock or for immediate delivery.—Moss, Wem. [X6803]

**A** J.S., 1916, 6h.p., actually in stock.—Crow Bros., 190, High St., Guildford. [3517]

**A** J.S., 1916, 2½h.p., 3-speed; £52.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

**A** J.S.; delivery from stock of all models.—Julians, Broad St., Reading. Phone: 1024. [X6762]

**2** 3h.p. A.J.S., 1915, 3-speed; 44 gns.—Troward, Heathurst, Vale of Health, Hampstead. [3833]

**19** 15 A.J.S. Combination, complete, lamps, etc., fine order; £82.—Cross, Birmingham Sq., Rotherham. [X6822]

**19** 16 6h.p. A.J.S. Combination in stock.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X7320]

**19** 16 A.J.S. 4h.p. Combination in stock.—Williams, A.J.S. Expert, Chapel Ash Depot, Wolverhampton. [X7356]

**19** 15½ 2½h.p. A.J.S., 3-speed, kick starter, lamps, horn, first-class condition; £47.—Norton, Birrill Tree, Tipton. [X7400]

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10320.	2½	1915 2-sp. CALTHORPE-J.A.P.	£25 0
10322.	5-6	1914 RUDGE Multi and Sidecar	£40 0
10323.	2½	1911 2-sp. DOUGLAS	£25 0
10324.	3½	NEW IMPERIAL J.A.P.	£25 0
10325.	3½	Single-speed CENTAUR	£12 10
10326.	3½	1912 F.E. RUDGE	£27 10
10330.	6	1914 3-sp. Chamo Drive REX	£55 0
		and Sidecar	£55 0
10332.	3½	Single-speed BROWN	£15 0
10333.	3½	1908 2-sp. TRIUMPH and S'car	£32 10
10334.	3½	1912 F.E. TRIUMPH	£25 0
10335.	4-5	1915 2-sp. BAT	£52 10
10336.	8	1914 Countershaft ZENITH and Sidecar	£60 0
10297.	3½	NORTON, variable gear	£37 10
10300.	2	1914 2-sp. CALTHORPE Junior	£17 10
10301.	8	1913 BAYARD Light Car	£125 0
10302.	10	1915 RITZ Light Car	£110 0
10303.	6	1912 2-sp. MATCHLESS & Sc.	£40 0
10304.	2½	1915 2-sp. DOUGLAS	£30 0
10306.	3½	1912 3-sp. PREMIER & S'car	£30 0
10307.	3½	1910 Single-speed TRIUMPH	£22 10
10316.	4½	1915 3-sp. QUADRANT & S'car	£62 10
10354.	2½	1916 2-sp. ALLON	£35 0
10260.	3	1914 2-sp. ENFIELD	£32 10
10267.	2½	1915 2-sp. NEW HUDSON	£30 0
10268.	10	1913 2-sp. HENDERSON & Sc.	£55 0
10271.	2	1915 2-sp. LEVIS	£37 10
10272.	8	1916 ENFIELD Com. dynamo	£95 0
10274.	2½	1915 2-str. ROYAL ENFIELD	£32 10
10233.	1½	AUTO-WHEEL	£20 0
10235.	6	1912 2-stroke WOLF	£20 0
10235.	2½	1915 2-sp. CALTHORPE-J.A.P.	£27 10
10243.	2½	1914 2-sp. 2-stroke CLYNO	£27 10
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10200.	15	1915 TRUMBLE Light Car	£100 0
10172.	10	1914 2-sp. HENDERSON & Sc.	£55 0
10142.	3½	1913 3-sp. SINGER	£32 10
10147.	6	1912 ZENITH and Sidecar	£35 0
10113.	20	1913 4-cyl. FORD	£67 10
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10093.	3½	1913 3-sp. ROVER Combination	£40 0
10091.	2	1912 CENTAUR	£15 0
10087.	6	1914 4-cyl. Baby PEUGEOT Light Car	£97 10
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10070.	6	1914 2-sp. ENFIELD Combination	£65 0
10068.	3½	1912 QUADRANT, variable gear	£20 0
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10009.	4½	1915 3-sp. JAMES	£52 10
9953.	2½	1915 2-sp. 2-stroke TYLER	£27 10
9946.	4	1914 3-sp. T.T. FORWARD	£29 0
9931.	6	1914 3-sp. A.J.S. and Sidecar	£73 10
9896.	3	1913 2-sp. twin ENFIELD	£35 0
9867.	2½	1911 2-sp. ENFIELD	£22 10
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Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**6** h.p. A.J.S., new November, 1915, and Mills-Fulford sidecar, only run 700 miles; offers.—Fletcher, High St., Tadcaster, Yorks. [X7331]

**A** J.S., 4h.p. twin, 1915, and coach sidecar, shop-soiled; reduced £75 to clear, bargain.—Campion Garage, London Rd., Derby. [3811]

**A** J.S., 4h.p. and sidecar, 1916 model, just delivered, 293/17, also 1916 2½h.p. model, £58.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

**A** J.S., 2½h.p., December, 1914, 2 speeds, handle clutch, kick starter, ridden very little; must sell; great bargain, £35.—Tarrington, Avonside, Evesham. [X6790]

**A** J.S. 1915 Combination, 6h.p., as new, usual spares, including spare wheel; nearest offer to £100.—F.R., 149, Kentish Town Rd., N.W. Phone: N. 26. [3682]

**A** J.S., 2½h.p., 1916, 3-speed, with all accessories, practically new, ridden under 500 miles; offer leaving for the Front.—Butler, 102, Hagley Rd., Edgbaston, Birmingham. [3669]

**A** J.S., late 1914, 6h.p., detachable wheel, mileage done about 5,000, with sidecar (very comfortable), with hood, side curtains, and wind screen; £60, or near offer.—Apply where can be seen, Stambam Cycle Depot, 57, Holborn Viaduct, London, E.C. [3947]

**A** J.S., 1914, 2½h.p., 3-speed, mechanically perfect, tank and frame, re-enamelled, very fast and powerful, Dunlop tyres, new back, pao saddle, Lucas horn, P. and H. lamp, really high-class machine; approval, deposit, £35, or near offer.—Kelman, Generating Station, Tidworth. [3647]

### Alcyon.

**A** LCYON, 2b.p., low, fast, new piston and back tyre, mag.; bargain, £11/10.—46, Cleveland St., Shrewsbury. [3852]

### Alldays.

**19** 15 Allon 2-speed; 32 gns.; perfect.—Troward, Heathurst, Vale of Health, Hampstead. [3834]

**A** LLDAYS Allon, all models; immediate delivery. easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0763]

**19** 15 Allon, 2½h.p., 2-stroke, countershaft drive, all accessories; £24.—Wilkins, Boot Stores, High St., Edgware. [X7146]

**A** LLDAYS Matchless, 1914, 2-stroke, accessories, speedometer, new condition; £21.—Blomfield, Dereham, Norfolk. [3725]

**A** LLDAYS MATCHLESS, 2½h.p., 2-stroke, new condition, accessories, 110 m.p.g.; £21.—Write, New Lodge, Hyde Park, London. [3959]

**A** LLON, 1915½, 2-speed, Millers lamp, horn, spare cover, mileage 1,200, good as new; £30, lowest.—Sackett, St. Albans Rd., Woodford. [3813]

**A** LLON, 2-stroke, 2-speed, 2½h.p., new February, little used; bargain, £32, or exchange Sh.p. Indian.—C. Pritchett, 141, Merton Rd., Wimbledon. [3769]

**A** LLON—Special easy payments for these wonderful lightweight, immediate delivery.—Colmore Depot, London Agency, 44, Finsbury Payment, City, 121, High Rd., Kilburn. [3506]

**A** LLON, 1915½, 2½h.p., 2-speed, as new, P. and H. lamps, Stewart horn, extra heavy Dunlops; £36, or nearest; appointment.—Stanley House, Broadway, Bexley Heath. [3934]

# THE MOTORCYCLE

ESTABLISHED IN 1903

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PARIS—Smith's English Library, 248 Rue Rivoli.

## Armoured Cars and Sidecars.

**I**N the early part of the war armoured cars were largely used by the different belligerents, but later one seldom heard of any notable achievements of these vehicles.

They were regarded in many quarters as being too heavy and cumbersome, and offering too good a target for the enemy's guns; another point against them was their unwieldiness in a narrow road, *i.e.*, the inability to turn round in a short space of time in case of necessity, whilst the amount of room they occupied on roads thronged with troops and transports was often a real disadvantage.

After a time the handy and mobile sidecar outfit transporting a machine gun was pressed into the service of the British Army, the Army Council being largely influenced in their decision to adopt this light and rapid means of transporting a machine gun by its extreme mobility and the manner in which it could turn round in a narrow roadway without recourse to a reverse gear. Extensive use is being made of the Sidecar Machine Gun Batteries, though, of course, the trench warfare which has ruled on the Western front for some months past has not given the batteries an opportunity of shining. Now, again, as the result of certain deeds, the armoured car is coming into the limelight, and it is only natural that comparisons are being made between the sidecar and the motor car as a means of rapid transport for a machine gun. Whilst the ground clearance of the sidecar is possibly a disadvantage, contrariwise the lighter vehicle scores by reason of the fact that it is lower and offers a smaller target for hostile guns.

This point is particularly noticeable in the case of enemy aeroplanes overhead, as the more compact and comparatively unobtrusive sidecar is not only less attractive to eyes in the sky, but it may be hidden in a ditch in a moment or run under any small tree, hovel, or shelter which may be found. Likewise the engine is more economical with petrol and oil, and con-

sequently necessitates less elaborate arrangements for supplies than would be needed for cars with engines possessing petrol-eating proclivities. Motor vehicles in ditches are quite common in this war; a sidecar is quickly removed in the case of such a *contretemps* by reason of its comparatively light weight; a heavy car in a ditch, however, is a different proposition, and may necessitate special tackle and a gang of men being brought up. As to the question of management, the sidecar and car are equally easy to drive, but on account of the smaller space required the sidecar is less liable to damage. In reliability, too, there is little to choose, though the sidecar scores in the matter of attention necessary and the ease of repairs compared with a car when the time arrives for replacements to be fitted. The simple air-cooling system of the sidecar is far preferable and less trouble than any water-cooling system, as water is not obtainable in every field in the war zone, and consequently drivers are tempted not to drain the radiator, and thus risk cracks in the cylinders due to freezing. We have heard of scores of cases during the present war where negligence of this kind has led to new cylinders being required, and the cars being out of commission for some weeks as a result. Road damage, too, must be considered, the heavier the vehicle the greater the damage to the road surface; no one of experience ever blamed a sidecar for churning up binding material of any road. What is likely to prejudice the chances of the sidecar in its fight with the light armoured car is the tendency to overload. As every experienced motorist knows, overloading has spelt the disaster of many a promising design, and the mistake, conscious or unconscious, is all too common to-day. One would never dream of fitting a limousine body to a light touring car chassis. Consequently, the mistake of imposing weights upon a sidecar chassis far in excess of its carrying capacity should not be repeated, otherwise trouble will be bound to follow.





("Road Rider" desires to express his indebtedness to Mr. C. Brown, of Messrs. Brown and Barlow, for much of the following matter. Messrs. Brown and Barlow issue an invaluable booklet of two-stroke tips for users of their carburettors.)

#### The Sparking Plug.

Some two-stroke manufacturers and agents supply sparking plugs with very thin and spidery electrodes, similar to those used on many American cars equipped with crude oiling systems. The idea is that the points will become hot, burn off any surplus oil deposited on them, and so prevent stoppages, due to sooted plugs. These advantages are possibly procured in gentle driving on the level; but Nemesis arrives when the machine is pushed along fast on the flat or forced up a long hill. The long, slender points then become hot enough to fire the mixture, pre-ignition sets in, and the engine pulls up suddenly. Until long slender electrodes, proof against overheating, are manufactured, the best two-stroke plug is one with a central electrode long enough and thick enough to conduct the surplus heat up into the body of the plug. Users should remember that the plug points on a two-stroke are not exposed to the cooling effect of the incoming charges, as is the case on a four-stroke. Overheated plugs are probably the commonest of all two-stroke troubles.

#### Starting with Petroil Lubrication.

A larger jet than usual is required, as the jet has to pass the normal quantity of petrol as well as the lubricant. In addition, it pays to empty the float chamber before storing the machine after a run. If this is not done the petrol will probably evaporate during the night, leaving a sticky mass of oil at the foot of the chamber. When the next start is attempted this oil may clog the jet, but must in any case spoil the mixture. The float chamber can be emptied either by shutting the petrol tap a couple of hundred yards from the garage door (the distance is soon found by experiment) or by removing the drainscrew provided for the purpose (if any).

#### Adjustment of Drip Feeds.

Crank case suction acts on all two-stroke drip feeds, and is apt to render their

behaviour exasperating. An owner starts his machine, and spends the first quarter of a mile in setting the oil to drip at the rate advised by the manufacturers. Then he opens up his engine, and "scraps." The crank case suction was very high when he first started, as he was driving slowly while he set the drip, hence the oil flowed freely. When he gets going he opens his throttle, reduces the crank case suction, and the drip slows down; so he gets less oil just when he wants more oil. Drips should, therefore, be opened up very perceptibly for speed work and hill-climbing.

#### Sluggish Drip Feed when Starting.

Engine oil often drips very sluggishly until the machine has warmed up, especially on cold mornings. Should this occur the oil must be thinned, for which purpose petrol is good and paraffin is bad. Paraffin will merely render the mixture even dirtier than it is already, and cause grave risks of a sooted plug. Petrol, at the rate of a teacupful to a tank of oil, will thin the oil, evaporate on reaching the crank case, and slightly enrich the explosive mixture until it is used up. The correct number of spots per minute for engines up to 300 c.c. is from fifteen to twenty-five in slow driving (up to twenty miles per hour, as when passing through towns), and from twenty-five to fifty per minute when hill-climbing or speeding on the open road. A faint blue haze should be seen astern when the lubrication is in order, but this haze must not be overdone or four-stroking will result. Perhaps the simplest test, when the rider is in doubt, consists of momentarily opening the release valve, when a decidedly blue puff should be emitted from the silencer.

#### Running in a Two-stroke.

A two-stroke engine is the better for being gently driven and slightly over-oiled when it is new. After the first decarbonisation the engine should be thoroughly run in, and as soon as the bearings have been thus well bedded down the machine may be forced along in a fashion which very few four-strokes can stand. The maximum pace may not exceed 35 m.p.h., a speed which can, of course, be freely employed on many of the main roads. If the engine is well run in, and oiled at fifty drops per minute, the engine will stand this pace indef-

initely, unless the sparking plug overheats, when it will stop comparatively suddenly and start off again cheerfully in a few minutes when the plug points have cooled down.

#### Four-stroking.

This annoying habit is practically always due to incorrect mixture or over-lubrication. A weak mixture causes popping back in the carburettor. The other cure is to master the oiling system so that an accurate amount of oil can be given. Such mastery implies a little initial care in the adjustment of the drip, or in the handling of combined petrol and pump systems.

#### Sparking Plug Gap.

The sparking plug gap should be the widest on which the engine can be started, and run slowly, as there is always danger of a globule of oil shorting a narrow gap. The width of the gap will thus depend on the intensity of the spark given by the magneto at low speeds, and some imported magnetos are very poor instruments. A good magneto will stand a gap of  $\frac{1}{16}$  in., but perhaps a more usual gap will be in the neighbourhood of 1 mm. or thereabouts.

#### Petrol Consumption.

Messrs. Brown and Barlow state that it is impossible to lay down a standard consumption for baby two-strokes, as their experience shows it varies according to the design of the cylinder ports; part of each fresh charge is lost through the exhaust port, and the percentage may vary with the design and area of these ports. Two machines of different makes, but of the same cubical capacity, may vary by as much as 30% in petrol consumption, when each is adjusted by an expert and provided with the same make of carburettor. In estimating consumption under petrol lubrication, it should be remembered that only 80-90% of the tank capacity is occupied by petrol, the balance being oil. The consumption is therefore from 10% to 20% better than a casual judgment would indicate.

#### Slow Running.

The ignition of two-strokes is timed much earlier than that of four-strokes. To obtain really slow running the spark lever must always be retarded as far as possible.



BY

LION

**Caught!**

In a recent paragraph about filing distorted pistons true till they settled down, I was naughty enough to set a little trap for the quasi-experts, but my bag included some bigger fish than I expected. It is, of course, a botching method at best; but the warping of pistons with high-efficiency engines is such a sad nuisance that until recently this particular dodge was the standard tester's trick at more than one of the biggest and most successful Coventry factories. I thought if I described it without giving authorities some of the know-alls would deride; but this botcher's tip has been applied to a winning Senior T.T. machine before now, and, for all I know, the plan may still be in use.

**About Knocks.**

I always hold that the diagnosis of knocks is extremely difficult unless one has the engine in one's possession, or unless one is very intimately acquainted with the make of engine in question. However, since some readers persist in regarding me as an inspired solver of difficulties by letter post, despite my weekly failures, may I say that one great help in diagnosing a knock consists in knowing whether or not the knock is accompanied by loss of power? If a knock arises from something being bent or out of truth, there is always a more or less marked loss of power, because of the friction involved; if, on the other hand, a knock arises from something loose, the running may be normal so far as efficiency goes. At the present moment I am hopelessly baffled by a knock in one of my engines, but it does its work as merrily as ever.

**About Rear Lamps.**

I am surprised that we hear so little about tail lamps. Motor cyclists have sat down very tamely under this ordinance, and from the absence of grumbles I must suppose that most people are well satisfied with the ordinary patterns on sale. Frankly, I continue to hope for something better. With rigid frames, a rear lamp mounted on the carrier is hardly ideal, as carrier vibration is about 100% worse than the vibration at any other point, and the lamp has to be very heavily built and mounted; moreover, it sticks out inconveniently, and the tube to the Y-piece at the generator is untidy, and apt to get pinched by one's leg. I have uniformly employed a Hunt dry battery tail lamp all winter; I keep two or three of them going, and stick them on the various machines I ride. They go on easily enough, as the battery box has two little hooks which slip over the chain stay or stand leg, and a top hook and frame clip make all safe. But they are hardly ideal in point of attachment. The top hook has to fit on the rear fork tube, and is so short that if there is a sprocket or brake drum of fair diameter, the clip

does not clear; this happens with two of my present mounts. Then you have to slip the hooks over the stand leg, and your stand is practically put out of action. My idea is that we want tail lamps to fit on the off side chain stay; you can prevent them from shifting and save the enamel from scratches by winding insulating tape round the stay. Given this sort of attachment, the dry battery tail lamp is excellent, as its little bulb takes very little current indeed.

**In Favour of Silence.**

I have just spent a week in one of those rural districts where there are ten corners per mile, and every corner is a hairpin. It has provided me with my one and only argument in favour of a dead silent machine. An absolutely silent machine is a good thing in such a district, provided yours is the only sample in the neighbourhood; for you can then hear the other fellows approaching the corners round which it is impossible to see.

**Another Recantation.**

I retract all the harsh things I have said of chain drive in the past. I shall doubtless reassert them with all the old venom as soon as a chain jumps off and winds itself round the calf of my leg, or jams itself inside the back wheel spokes. But my latest police-bristler has a two-chain drive which is really as silky as a well bedded belt; and as I have to drive through a water-splash at the foot of a steepish hill twice a week, I appreciate it—*pro tem*.

**Details Count with Two-strokes.**

I recommend disgruntled two-stroke owners to study the tips published by "Road Rider" in this issue, which largely embody the testing experiences of a leading carburetter firm. I have read them in proof, and they suggest to me the huge importance of detail accuracy in managing a two-stroke. Getting the right sparking plug is threequarters of the battle; and as so many two-strokes will only take midget plugs, many riders are using obsolete plugs, which have lain long in garage stocks. The other quarter of success lies in extreme precision about oiling; and we all know how the average owner's one concern about oiling is to avoid under-oiling at any price. The four-stroke has created in his mind the false impression that over-oiling doesn't matter; whereas it causes a two-stroke to misfire abominably, and caulk up the top ring in its groove within 200 miles.

**Good Carburetters Not Wanted.**

As my readers know, I am a child in theoretic matters, and merely babble ignorantly of half comprehended experiences, so I must rest content to quote the following, and leave it to wiser heads to dissect

**Occasional Comments.—**

the information offered. A firm is anxious I should try its patent automatic carburetter. In the course of correspondence it offers the following remarks, which I am sure will interest many readers: "You are aware that on single-cylinder sidecar outfits, the inequality of the torque coupled with the heavy load makes it necessary as a rule to use high compression, in order to get sufficient power. The consequence is on picking up with a correct mixture there is on several makes a great tendency to knock—not through defective carburation, but for precisely the reverse cause—and on such engines a carburetter giving the perfect mixture is not so good as one which can on such occasions administer a 50% petrol overdose to suitably retard the flame rate" (purists will kindly note that the split infinitive is not mine!). At last I know why I never got such good results as Hugh Gibson did with the  $3\frac{1}{2}$  h.p. sidecar outfit. I tuned my carburetters not wisely but too well, and went in for perfect mixture. He threw economy to the winds, went in for spasmodic 50% overdoses of petrol, and miraculous hill-climbing.

**Kick-starting with Automatic Carburetters.**

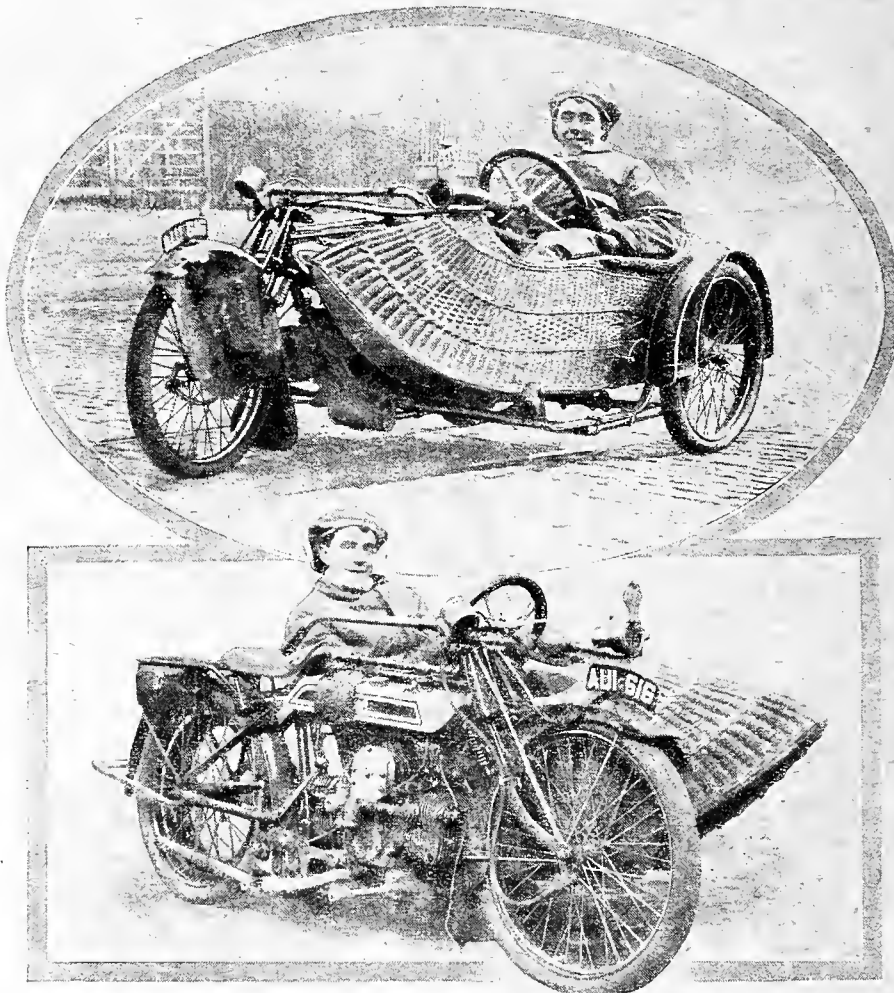
I will supplement the above theory with some practical experience. One joy of the automatic carburetter is that you can kick start on it with the valve lifter down. If I have to wangle a kick-starter in conjunction with a valve-lifter, I am always seen at my clumsiest. I always let down the valve too late and waste my kicking on the desert air; or, alternatively, I drop the valve too soon, and get hoisted out of the saddle. But now that I am using an automatic carburetter, I kick-start against full compression, *à la* motor car starting

handle; by the older and cruder method, you flood your carburetter liberally, and get a steaming head of petrol vapour to cancel the surplus air being sucked in through the lifted exhaust valve. Anyhow, I know which I prefer.

**Four-speed Ratios.**

I was a trifle surprised on paper at the ratios selected by various designers of four-speed gear boxes recently to hand at the office; and my ideas on the subject still want

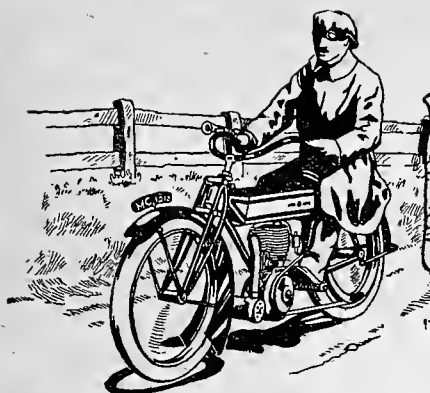
clearing up a little, so I ventilate the subject in the hopes of receiving a plausible pointer or two. Here is a series which approves itself to more than one designer within very narrow variations:  $4\frac{1}{2}$ ,  $5\frac{1}{2}$ ,  $9\frac{1}{2}$ , and  $13\frac{1}{2}$  (with a  $3\frac{1}{2}$  h.p. engine). Would you not say off hand, gentle reader, that the  $9\frac{1}{2}$  second-speed is on the low side, and would you not suggest something nearer 7 or  $7\frac{1}{2}$ ? Mind you, I have not formed any convictions as yet. The other ratios are obviously intelligible. You have your high fourth for blinding under nice conditions, and for quiet ticking downhill; you have your slightly lower third for adverse conditions of not too arduous a character, and it is just the



**STEERING FROM THE SIDECAR.**

Many attempts, resulting in varying degrees of success, have been made to arrange for the steering of a sidecar outfit from the sidecar. One of the most successful is that devised by George Brough and shown above. In this a car-type steering wheel is attached to a special bar, the other end of which is located at the top of the steering head. The brake and carburetter levers are arranged accessibly, and a comfortable driving position is the result.

want of this fractionally lower top which makes the three-speeder imperfect minus a Philipson pulley. And you have your precipice-crawler for A.C.U. trials, and special stunts. But  $9\frac{1}{2}$  is certainly an uncommonly low second speed. After all, any decent motor bicycle engine can perform miracles on a 7 or  $7\frac{1}{2}$  gear with a rush. I myself have made clean ascents of most of the fair test-hills on higher gears than that. Do any four-speeders care to weigh in with their ideas on a subject which is assuming some importance, as the number of our ratios increases?



## HILL-CLIMBING FORMULÆ.

Why "The Motor Cycle" Adopted and Popularised  $T^2$ .

**E**ARLY in 1911 it became increasingly evident that the formula devised by Prof. Callendar and adopted by the A.C.U. was by no means a satisfactory means of arriving at a figure of merit which should be even approximately correct. Speed had by that date increased very much all round, and it was, in consequence, more and more necessary to use a formula which took some cognisance of this fact. Again, riders had discovered that extra weight gave them a great advantage on formula, especially when combined with small capacity. So much so that if a powerful machine were to win it had to ascend the hill at an absolutely impossible rate of speed—in some cases over 60 m.p.h., and the speed on a hill is limited not only by the power of the machine and the skill of the rider, but by the nature of the hill itself.

As the power, required to overcome air resistance varies as the cube of the velocity, it was suggested by some that a formula which incorporated  $T$ ,  $T^3$  and some constant determined by the length and steepness of the hill should be adopted. This would give excellent results, but it seemed to us that it was unnecessarily complicated, and we felt that any formula which was to displace that in use would have to be equally, or nearly equally, simple.

### Attempts at a Better Formula.

This question was referred to in an article in *The Motor Cycle* of May 25th, 1911, and it was stated that a committee of the A.C.U. had been requested to find a better formula. Whether this committee ever found a better formula we have yet to hear. Two days later the Lincolnshire A.C. carried out a series of speed tests at Grimsthorpe Park, and on this occasion the formula which has since become known as

*The Motor Cycle* formula was used, viz.,  $\frac{C \times T^2}{W}$ . It must be remembered, however, that this was not a hill-climb but a speed trial on the level.

On June 8th, 1911, we published an interesting article on the subject by B, who suggested  $\frac{W}{CT} + \frac{K}{CT^3}$  K being a constant which would vary with the hill.

On August 17th of the same year a letter appeared from Mr. C. R. Churchward, of Norwood, South Australia, in which it was stated that his club had adopted the formula  $\frac{W}{C \times T^2}$  two or three years previously. To this club, therefore, belongs the credit of first using this formula, while in this country it was

first used, so far as we can ascertain, by the Lincolnshire A.C. in the event already referred to, and first used in an open hill-climb by the Streatham and District M.C.C. on September 30th, 1911. The latter club also claim to have used the formula in club events previously, but, while we do not dispute this claim, we are unable to confirm it or find out upon what date it was used. (In a hill-climb held on May 4th this club was using the A.C.U. formula.)

### Our Selected Formula.

In our issues for September 7th and 14th, 1911, after the Coventry and Warwickshire M.C. hill-climb, we went into the formula question rather fully and decided

to adopt and recommend the formula  $\frac{D^2 \times S \times T^2}{W}$

which is  $\frac{C \times T^2}{W}$  with the constant .7854 omitted (by

the way, we prefer to place  $W$  at the bottom as it simplifies calculation, and in this case the lowest figure wins). These articles produced an interesting correspondence in our pages, the adoption of  $T^{1.5}$  and  $T^{1.3}$  being among the suggestions put forward. Since this time, we have done much to popularise the formula as the simplest and most suitable for motor cycle events, with what success all motor cyclists know. Later, the Streatham club adopted a modification in the shape of a weight limit for each class, but we do not consider this to be an improvement, in the first place because we do not think it necessary, and in the second because on a single climb a machine entered in two or more classes might have a different figure of merit in each class. A careful study of the results in the Army and Navy Hill-climb held on September 25th, 1915, will, we think, confirm this opinion.

### The Origin of $T^2$ .

*The Motor Cycle* does not claim to have originated the formula, which is simply an adaptation of the A.C.U. formula with  $T^2$  substituted for  $T$ . The first part is undoubtedly due to Prof. Callendar, but there are several claimants to  $T^2$ ; for instance, the Streatham club claim to be the originators in 1911. Mr. Churchward says his club adopted it two or three years previously, i.e., in 1908 or 1909, but it was first suggested, so far as we can discover, on December 13th, 1906, in a discussion which followed a paper read by Prof. Archibald Sharp, B.Sc., A.M.I.C.E., before the members of the Auto Cycle Club, as it was known in those days, and the credit for its suggestion belongs to Mr. Horace M. Wyatt, a constant contributor to our pages. A report of this meeting may be found in *The Motor Cycle* of December 19th, 1906.



# NAVAL AND MILITARY NOTES.

## NEWS OF WELL-KNOWN AIRMAN

NEWS has been received that Mr. M. A. J. Orde, of the R.F.C., is now a prisoner of war in Germany. Orde, who is the son of Mr. Julian Orde, the R.A.C. secretary, and a well-known T.T. Rover rider before the war, was reported missing some few weeks ago.

## "THE PAPER THAT PERSISTENTLY PROPHESIED THE END OF THE YEAR."

THIS is printed at the top of the cover of the March number of *The Strafer*, a copy of which we have recently received. Good as was the previous number, this one is better. Both letterpress and sketches are really excellent, and we wish we had the space to give some extracts. However, the following must suffice:

Why did the leather clutch?

Because it saw the wheel tyred.

*The Strafer* is written and printed by men serving with an A.S.C. Ammunition Park attached to the G.H.Q., and the leading lights in the enterprise are to be congratulated.

## MORE RAZORS WANTED.

SOME of our readers may remember the appeal made some little time ago by Mr. Harry Smith, managing director of the Rover Company, for old razors. He has already sent 2,753 to the Master Cutler to be ground and sent to the troops, and now, owing to the appreciation by the War Office of the work and the steady growth of the Army, a fresh appeal is made. The Cutlers' Company have forwarded no fewer than 135,000 razors to the military authorities. Any reader having an old razor, chipped or rusty, should forward it to Mr. Harry Smith, the Rover Company, Ltd., Coventry, and he may rest assured that it will be appreciated and good use made of it.



R.E. DESPATCH RIDERS IN TRAINING SOMEWHERE IN THE SOUTH MIDLANDS.

From left to right, Cpls. Reynolds, Garrison, Shaw, Ryder, and Muggleton.

## AN AMERICAN VERSION OF DESPATCH RIDING.

AN American contemporary gives a very lurid account of the dangers to which D.R.'s are exposed when on duty. The account is that of a Boston boy who served as a D.R. with the Allies during the fighting around Ypres, and finishes by stating that "out of a corps of thirty-one riders, with whom Robinson started on duty at Ypres, only four were alive when he left." This statement gives a wholly exaggerated idea of the dangers to which motor cyclist despatch riders are subjected. Of one section which left for the Front early last year, only one man has been lost.

Several illustrations of Robinson are given purporting to be taken while on duty near Ypres. He is seen mounted on an Indian motor cycle which is fitted with a pillion seat. Rather an unusual type of mount for a D.R.

## THE WAYS OF DESPATCH RIDERS.

WRITING from France, Donald E. Parsons, A.S.C., M.T., says: "You know the W.D. Douglas has the two-speed gear box and no clutch. Well, I have seen riders of these mounts stop the road wheels and keep the engine running; then when they want to move off they paddle for a yard or so and slip in the low gear—still with the engine running. Of course, the rear tyre makes an excellent emergency clutch, but I don't envy the job our workshop staff-sergeant will have when the gear dogs do strip. It would make the designer weep, too, to see them drive on the exhaust valve. They ignore the throttle."

The practice referred to is not so damaging if only an expert is handling the machine. Provided the engine is revolving at the same speed as it would be when driving the machine, the dogs will engage without noise, and the drive will be taken up without shock. We have several times done this on this make when fitted with an automatic carburetter. It is similar to a practice sometimes carried out by expert car drivers, namely, descending a hill in neutral with the engine running. When the bottom is reached the driver casts his eye on the speedometer, and accelerates the engine to the point at which he thinks it would be running if it were driving the car; then, without releasing the clutch, he pulls the top speed lever over, and it engages with a gentle click or with no noise at all, and the drive is taken up absolutely without shock.



Some men of the Motor Machine Gun Section starting for a Saturday afternoon's run on their own machines. Reading from left to right, Gunners H. Ellocott (B.S.A.), G. Hall and H. Brown (B.S.A. sc.), C. A. Wells (Douglas), and A. Phillips (Norton). Quite a number of men of the M.M.G.S. have their own mounts at the training centre.

## LAKE VYRNWY.

### A PARADISE OF LONELINESS.

**A**T the touch of spring, when nature is awakening from its long winter slumber and all the land is glorious with the rich colouring of hedge and field and forest, visions rise and float before the mind of choice spots that have been visited in days gone by, and whose memory is an insistent call that is hard to resist when one knows that they are once again resplendent in the tints and virtues of the spring.

confidence; and if one have no reason to fear a long hard climb and a stiff descent with many intersecting water channels, then the run over this pass to Bala will be an exhilarating and rewarding one, affording, as it does, a visit to the rival lake of Bala.

The second pass that bears more south toward Llanymawddwy and Dolgelley is less patronised, and for obvious reasons. It is not impossible, but it



Among such haunts the lonely Vyrnwy Lake holds a high place. Lying, as it does, far from the common ways of tourist and traveller, with a wild barrier of ten miles of hills between its silent waters and the railway on the east, it is of necessity to a large extent the monopoly of the cyclist and the motorist; to the former the long gradients prove a burden, while to the latter they offer just that variation from the level roads that is so welcome in a long day's run.

Around the shores of Vyrnwy runs a roadway, with ideal surface and ever-changing scenery, making a circuit of eleven miles; while from the western head of the valley two roads run over the mountains, offering opportunity, to those who relish a climb and are not averse to difficulties, of escaping from the lake to other scenes of beauty that lie westward of the Berwyn Hills.

#### A Choice of Routes.

The Bala Pass, the easier of the two, once dreaded by the motorist because of its rough surface and trying gradients, is becoming increasingly familiar to the more ambitious riders now that power and reliability give

requires courage and a love of doing things. A brief trip over unrolled metal, a little manoeuvring round the corners of a farmyard, and an excursion along a narrow ditch would familiarise the motorist who desires to take this route with a somewhat exaggerated type of the road that is to be faced. A cycle stands a better chance of accomplishing the run than a light car or a car, for the narrowness of the road at parts forbids the passing of two vehicles. However, there is the way, and those who accomplish the climb will doubtless say that it is worth the cost.

#### Sport for Rod and Gun.

But Vyrnwy may be accepted as a resting-place whereby to spend a quiet holiday, and it possesses attractions and interest enough to fill the hours of many idle days. The fish in its waters await the rod and line, and possess a virtue of their own. The game, when the time is ripe, await the gun along the hills and moors, while the climber will find long and inspiring rambles over the Arran and the Berwyn mountains that will awaken an alarming appetite.

**ROUND ABOUT LAKE VYRNWY**  
 (Top left) The lake from the hotel.  
 (Top right) The pass to Bala.  
 (Centre) A distant peep of Lake Vyrnwy.  
 (Bottom) Another view of the Bala Pass.

### Lake Vyrnwy.

The great hotel high-placed above the lake gives generous hospitality, and has seen royalty within its walls. Its terrace affords a magnificent panoramic view of the lake and the hills and the setting sun.

It was the hand of man, inspired by the wisdom of man, that barred the progress of the little Vyrnwy stream as it sang its quiet song down this wild valley and compelled it to become a mighty flood, and the grey granite dam that has been thrown across the valley does not strike a discordant note in the scene,

but somehow falls into quiet harmony with the surrounding hills.

When long rains have flooded the lake beyond endurance, or when the westerly winds pile up the water toward the dam, the white torrent pouring into the valley far below is a majestic spectacle.

The motorist who delights in solitude and desires to vary the road with the scenery and pursuits of mountain, lake, and stream will find few places more suited to his needs than this lonely lake among the hills of Central Wales.

## THE LIGHT TWIN.

### AN IDEAL DOUBLE-PURPOSE MOUNT.

THERE is a 5 h.p. twin-cylinder American machine, the name of which would not be unknown to certain readers, which, I believe, represents a class of mount that will become enormously popular in this country. I have not ridden this particular production from the States, and the makers' handbook, though containing the usual number of adjectives and sunshine (or moonshine), is characteristically devoid of such facts as the practical rider looks for. There is, therefore, no mention as to the weight of the machine, but from a cursory glance it appears to me to be about the same weight as a P. and M. or a Sunbeam single, while it is quite solidly constructed and well designed.

The single-cylinder machine of  $3\frac{1}{2}$  h.p. or 4 h.p. has met with a certain degree of popularity for sidecar use owing, primarily to its comparative lightness, secondly to its economy, reliability, and to the fact that it is ideal for solo use when a sidecar is not required, but there is no doubt that two cylinders are better than one for passenger work of any kind. Driving a single-cylinder sidecar outfit is a monotonous business unless the sidecar be light and the engine in perfect trim, while a good handle-bar clutch and a freakishly low bottom gear are practical necessities. The double impulse and the even torque of the twin render it much better suited for passenger work, but at present the choice lies, with but few exceptions, between an unnecessarily heavy sidecar outfit or a  $3\frac{1}{2}$  h.p. touring mount with light sidecar attachment.

#### My Ideal.

With the enormous popularity of the sidecar, British manufacturers have concentrated their energies on the production of a special type of machine which, though admirable for sidecar use, possesses the great disadvantage that it is not suitable for solo use. The outfit—both the machine and the sidecar—is, moreover, a good deal heavier than the majority of sidecarists really require, the labour of backing it out of the shed and up the gravel path three or four times a day being unnecessarily strenuous; but at the same time they require a machine which will ride comfortably and capably through a long tour, or which, on occasions—domestic or otherwise—is ideal for solo use.

This double-purpose machine has not yet materialised. There are many light, strong, and comfortable sidecars produced, but there is a dearth of light and powerful British-made twins, possessing the essentials of a sidecar machine, to match them.

My ideas as to an ideal double-purpose mount, capable of serious touring and suitable for everyday use, are, briefly, as follow:

Weight, about 200 lb.

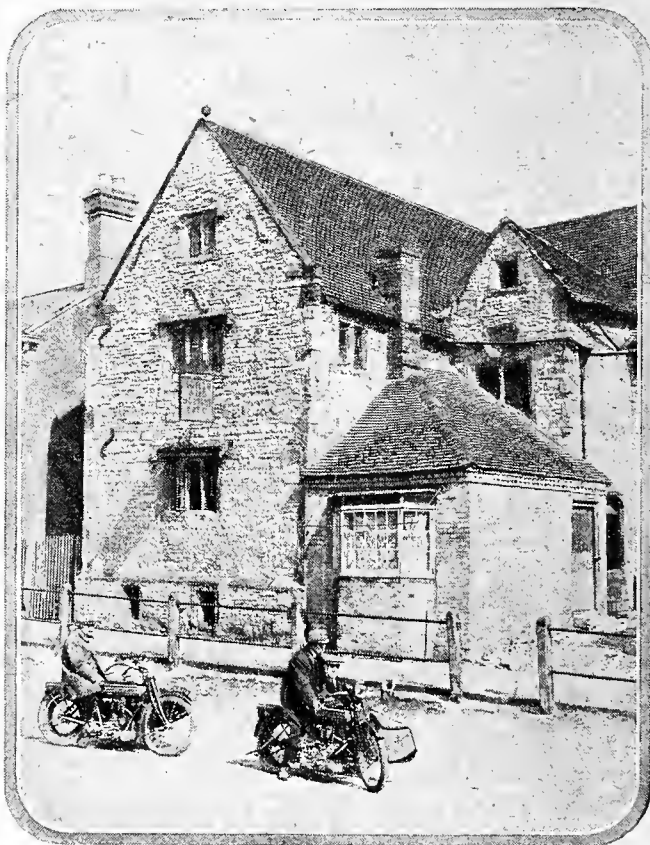
Engine, horizontal (preferably) twin; about 600 c.c.

Gear, three-speed countershaft.

Clutch, metal-to-metal multiple plate, handle-bar and pedal controlled.

Transmission, all chain, enclosed; shock absorber in rear sprocket.

H.M.B.



AN INTERESTING LINK WITH THE PAST ON THE MAIN COVENTRY-OXFORD ROAD

The Horse and Jockey Inn, between Long Itchington and Southam, that was originally an old mint house. There is a massive oak staircase inside, and many other reminders of bygone days.

# HILL-CLIMB FOR PUBLIC SCHOOL BOYS.

A much-discussed Wartime Event run off in Spite of Official Opposition.  
Thirty-two Competitors on Machines varying in Weight from 140 lb. to 375 lb.



Bertram Currie, Eton (2½ h.p. Allon), nearing the top of Snowhill, near Broadway.

**W**HAT was termed the Public Schools Motor Cycle "Championship" was run off on Wednesday last, the 12th inst., the venue being Snowhill, near Broadway, Worcestershire. The weather was far from propitious for the occasion, as rain fell heavily in the morning, and somewhat heavy showers were the order of the day.

Though it had been announced by the promoters of the gathering that there were nearly 150 entries for the event, only thirty-two competitors put in an appearance. Whether this was due to the action of the A.C.U. in questioning the advisability of holding such an event in these times—quite apart from the fact that no permit had been obtained—or whether it was due to the unfavourable weather, or a combination of the two, we cannot say, but nevertheless the event naturally lost much of its promised importance.

The A.C.U. contended that the holding of the event was in direct opposition to the overtures of Government departments, who are endeavouring to limit unnecessary motoring, the defence of the organisers being that, as the competition was only open to public school boys, it would be very instructive for them should they join the Royal Flying Corps, M.T., or other specialised branches of His Majesty's Forces, while the expense incurred would be infinitesimal.

## The Weighing Operations.

All machines were weighed at the foot of the hill. The lightest machine was the Baby Triumph, which turned the scale at 140 lb. It was ridden by D. H. Hulbert, Rossall School, and son of Mr. F. Hulbert, the well-known motor depart-

ment manager of the Triumph Co., who was also present as a spectator on a Triumph sidecar. The heaviest machine was the electrically-equipped Harley-Davidson, which, after causing the scale tripod and rope to collapse, finally recorded 375 lb.! The times were taken

by Messrs. W. H. Wells and F. W. Barnes. Quite a number of the competitors were attired in the uniform of their respective school's O.T.C.'s, which gave support to the promoters' arguments that the meeting was a desirable event, as it enabled competitors to



SCENE AT THE START, showing W. H. Dare, King Edward's (2½ h.p. Clyno), waiting for the word to go. It is a sign of the times that in this group there are only two men of military age.



**Hill-climb for Public School Boys.—**

keep up practice and maintain a knowledge of mechanics that would be beneficial hereafter when the contestants were old enough to join the Forces. The climb had been timed to commence at 2 p.m., but it was decided to give half an hour's grace to enable a few late comers to weigh in and be ready to start. The best climb in Class I.A was that of J. V. Prestwich, Harrow, son of Mr. J. A. Prestwich, the maker of J.A.P. engines. His little Calthorpe, fitted with a 2½ h.p. J.A.P. engine, though clearly not running at its best, made a good climb, and was fastest on time in this class. The performances were generally poor, all competitors making extremely bad starts; especially was this the case with the little two-strokes. The results, on time only, are:

1. J. V. Prestwich, Harrow (2½ Calthorpe-Jap).
2. C. L. Whalley, Malvern (2½ Levis).
3. J. Culner, King Edward's (2½ Ixion).

Class I.B, for machines under 300 c.c., but with variable gears, was somewhat disorganised at the start owing to two farm waggons coming up the hill, and several of the riders had to have second attempts in consequence; also several of the riders were uncertain where the climb ended, and stopped prematurely. They

were therefore allowed second attempts, and in all cases the second attempt was far and away better than the first. The star ascent in this class was undoubtedly that of D. H. Hulbert on the Baby Triumph, who got away in a most businesslike manner, while the clear hum of this engine was pleasing to hear. His was also probably the steadiest ascent of the day. Results on time:

1. D. H. Hulbert, Rossall (2½ Triumph).
2. R. Chatley, Highgate (2½ Allon).
3. R. D. Clive, Repton (2½ Triumph).
4. W. H. Dare, King Edward's (2½ Clyno).
5. J. L. Hadley, Marlborough (2½ Calthorpe).

In Class II.B, for machines between 300 and 350 c.c. with variable gears, out of twenty-three entries only six started—four Douglasses and two 2½ h.p. A.J.S.'s. Order of result on time:

1. G. Butcher, Bridgnorth (2½ A.J.S.).
2. A. Pitt, Lancing (2½ Douglas).
3. P. W. R. Kaye, Harrow (2½ Douglas).
4. R. A. Loch, Cheltenham (2½ Douglas).
5. T. H. Gladstone, Oundle (2½ Douglas).

Class III., for 500 c.c. machines.—Cubitt, on a 3½ h.p. Norton, was the first in this class, and, in spite of making a poor start, succeeded in making a splendid climb and getting fastest time of the day.

C. C. Bemrose (3½ h.p. N.U.T.) was the next to start, but his belt broke

before he passed the bottom timekeeper. He was allowed another attempt later, after effecting a repair, when he made a very creditable climb. Results:

1. \*W. P. Cubitt, Charterhouse (3½ Norton).
2. C. C. Bemrose, King William's (3½ N.U.T.).
3. W. B. Hughes, King Edward's (3½ Rex).
4. L. B. Blaxland, Shrewsbury (3½ Ivy).
5. J. E. Pugh, Shrewsbury (3½ Rudge).

\*Fastest time of the day.

In Class IV.A there were only two starters, viz., the two Harley-Davidsons, and it was expected it would be a big tussle between these two machines for fastest time of the day, but, owing to the atrocious state of the hill surface, the riders were unable to do more than make steady climbs. W. F. C. Powell (Rossall) proved to be the faster of the two. After the climb we had the pleasure of riding one of these machines up the hill, and, in spite of the beautifully smooth running engine, it would have taken a man with a nerve of iron to ride one of these heavy mounts at even quarter throttle on so bad a road surface.

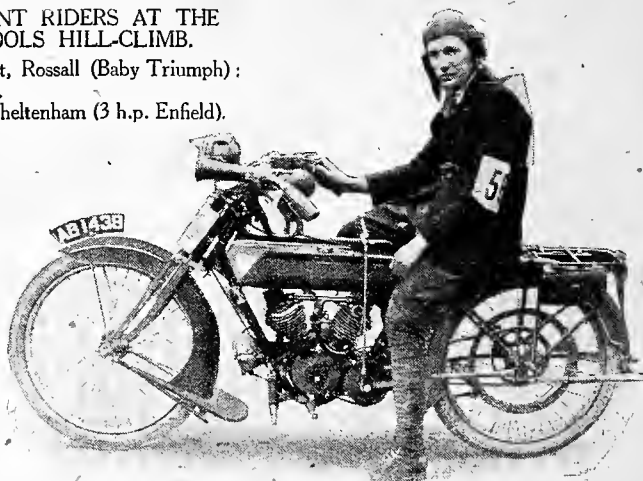
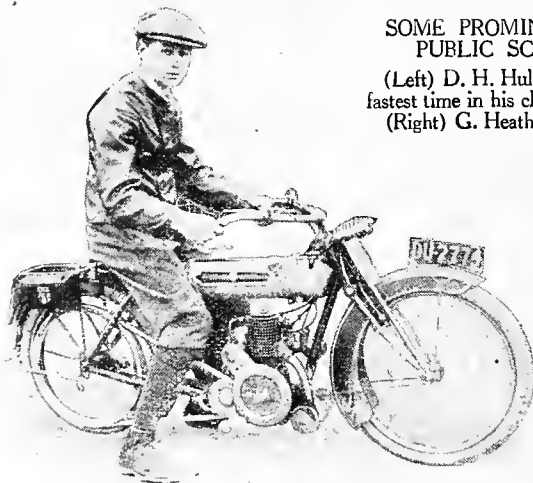
**GENERAL OBSERVATIONS.**

It was interesting to contrast the performances of these lads and their way of handling their machines with that of

**SOME PROMINENT RIDERS AT THE PUBLIC SCHOOLS HILL-CLIMB.**

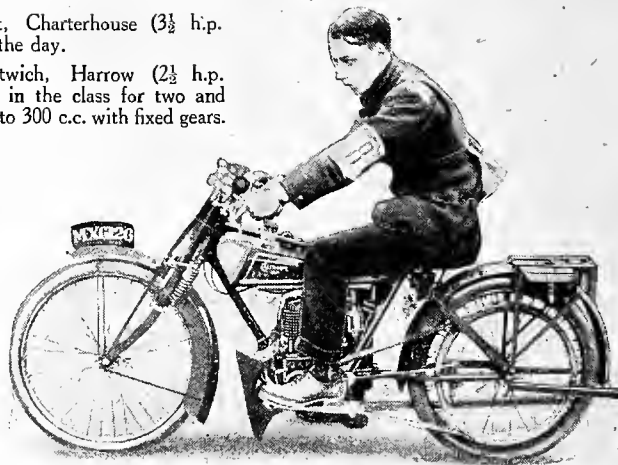
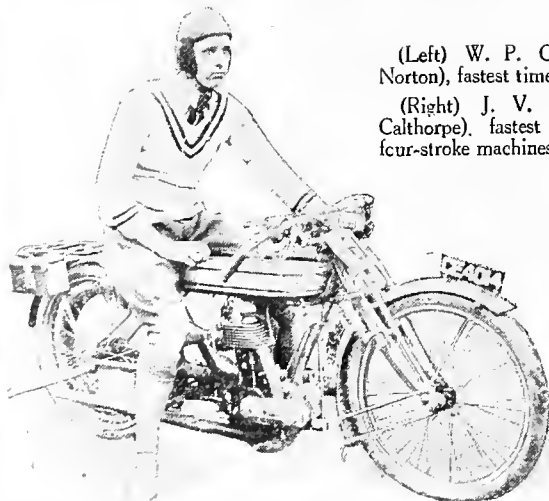
(Left) D. H. Hulbert, Rossall (Baby Triumph): fastest time in his class.

(Right) G. Heath, Cheltenham (3 h.p. Enfield).



(Left) W. P. Cubitt, Charterhouse (3½ h.p. Norton), fastest time of the day.

(Right) J. V. Prestwich, Harrow (2½ h.p. Calthorpe), fastest time in the class for two and four-stroke machines up to 300 c.c. with fixed gears.



**Hill-climb for Public School Boys.—**

old experienced riders in the good old hill-climbs of bygone days, and most made poor starts, probably due to over-anxiety, which was not allayed by the starter, who seemed to take great delight in hustling them.

Contrary to the experience of most hill-climbs, there seemed little enthusiasm among the competitors to know the results, and at the Lygon Arms Hotel in Broadway, when the results on time were announced, not more than five of the competitors were present to hear them.

T. V. West, of Cheltenham, now serving in the A.S.C., was present, having arrived on his little racing Calthorpe on which he was to have driven in the cancelled light car race in the Isle of Man. The little car was evidently intended more for speed than comfort.

The starter, W. Cooper, was very free with his advice to the competitors, who seemed unwilling to open the throttle and start off with a rush on the greasy road, telling them to "open the throttle wide and let the engine do the rest," but when later he tried the hill himself in the grease he did not appear quite so enthusiastic about the open throttle idea.

Generally speaking, with the exception of the Baby Triumph, the two-strokes did not make good climbs, all showing a great tendency to four and eight-stroke.

C. C. Bemrose, whose school is in the Isle of Man, told us that they have never been officially allowed to witness the T.T. races. He had, nevertheless, usually managed to get away somehow or other to see them.



Some of the thirty-two competitors. J. V. Prestwich, Harrow (2½ h.p. Calthorpe-Jap), is seen starting.

An interesting feature of the event was the number of sons of well-known men in the motor cycle trade who took part.

Snowhill is situated about a mile from Broadway; the road is almost straight, while the gradient is not unduly stiff even at the steepest point, which was

near the summit. The surface, though fairly smooth, was wet and slippery.

Evidently *The Times* representative was present! On Friday that journal referred to the event having been held on Thursday, and to the entry of "150 competitors, and about 40 schools were represented." Let us hope the Board of Trade officials were not misled.

## THE MOTOR CYCLE IN CHINA.

IN many parts of China motor cycles are still a novelty. Roads, or rather the lack of them, are, in the main, responsible for the comparative lack of progress. The following, however, is not an article dealing with the possibilities of the motor cycle trade in that part of the world, but a reproduction from a Shanghai paper of some impressions of motor cycling in North Kiangsu. It is such an amusing description that we reproduce the article in full and exactly as it appears in *The North China Daily News* of March 7th last:

"Within two years two men up here have got motor cycles. Above the line of Tsingkiangpu and Pengpu; rice is not cultivated, and the fields are not cut up by canals. Roads are possible, but not in repair. There are only paths for barrows and difficulties for carts. The single cycle which follows the barrow track runs easily and some excellent trips have been made. When the sidecar is attached many difficulties must be negotiated. The longest trip yet made in one day, with the sidecar attached, was from Hsuechowfu to Suchien, a distance of 80 English miles. It was against a driving, east wind;

which wind brought snow and rain in its train. The traveller in the ordinary vehicle must have been held up in a mud hovel without fire and without the food that he would like.

"The novelty of this arouses much excitement. Even the hares get jealous at this trespass on their domain of swiftness.

### HARE VERSUS MOTOR.

"We saw him hopping up to the road and preparing for the contest. The *gaudium certamenis* twined every muscle of his back. He proposed to race that ugly usurper with the ugly bark. He played the game. Chose a good piece of road, and started even. How lordly he felt as he took the lead, tossing off his course as if it were nothing. Gradually he drew away from us. So the driver changed to his fastest gear. Now it was 'nip and tuck.' His ears softly dipped and danced on his shoulders as he sped along. Applause put the last ounce of speed into his flying form. Yet the red monster was neck and neck, not gaining an inch! The driver then injected extra gasoline. The machine fairly lifted itself and bounded forward. In another moment the challenger must

be under the wheel; when he doubled, all the while going at top speed—and went off through the fields, taking slow high leaps, as if he were saying: 'You can run some, but you are not in my class yet.' He had fairly won. What man-made machine could take that turn at that speed and yet go off on an even keel?

"As one passes through the country the excitement among the towns and villages was phenomenal. It was not fright nor ill will. It was plain curiosity pure and simple.

"Drive into a village where every one is nursing arms in homes or tea shops. The streets bare, but for an occasional hawk or two. Drive out at the other side and look back. It is as if one had struck a hive of bees. They tumbled out in crowds, looking at the fleet visitor. One leaves the gate and street China-blue with people, to go ahead and surprise another town.

"Stop on the street for a moment and the crowds behind fall over those in front. After one or two trips it is an old story and they will only be excited at an aeroplane.

"The motor cycle is here to stay."

## TIMES TO LIGHT LAMPS.

(GREENWICH TIME)

April 20	...	7.31 p.m.
" 22	...	7.35 "
" 24	...	7.37 "
" 26	...	7.41 "

## Relief for Doctors.

Doctors of medicine, we are informed, will only be charged half the new motor vehicle taxes.

## Ineligibles as Testers.

Recently we published a request of a manufacturer for the names of experienced motor cyclists ineligible for service with the Army or Navy who could release eligible men as motor cycle testers. A number of replies were received, and the vacancies were quickly filled; in fact, there are names of ineligible motor cyclists over and above the requirements as outlined to us up to the present.

## Transferred to the R.F.C.

Sec.-Lt. F. M. C. Houghton, who was the originator of the successful services meetings held at Brooklands last year, and the writer of an article in *The Motor Cycle* of last week entitled "True Tales of Despatch Riders," is to be shortly transferred from the 25th Division Cyclists to the R.F.C., where he will receive his training as an observer, prior to taking his ticket.

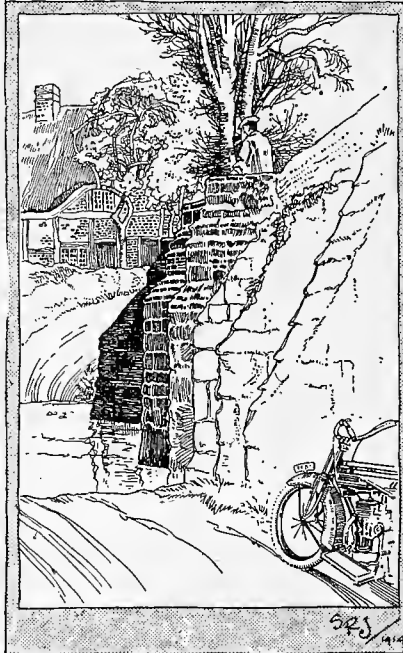
## The Prohibition of Imports.

The Americans are naturally somewhat annoyed at the prohibition of the importation of motor cycles and parts into this country, but several of the leading makers assert that they anticipated it, and have in consequence large stocks at their English depots. This probably accounts for the large number of machines imported during the past month. Mr. Walter Davidson, of the Harley-Davidson Motor Co., says that the American market is in splendid shape this year, and will probably absorb all of the motor cycles all the American manufacturers can put out.

## Motorists and the Budget.

The Executive Committee of the Automobile Association, on behalf of 90,000 members, have communicated with the Chancellor of the Exchequer suggesting certain modifications with regard to the Budget proposals affecting motor vehicles. We think that a better case could have been put forward. For instance, no mention is made of tradesmen's vans or sidecarriers—in many cases the sole means of delivering goods since horses were requisitioned for the Army. It is suggested that the proposals in respect of the increased taxation of motor cycles are too drastic, and that any additions to the present taxes should be on the original basis.

In support of these suggestions, it is pointed out that many people are to-day using cars and motor cycles as a consequence of the war (many for utilitarian

CURRENT  
CHAT

purposes, e.g., doctors, surveyors, and other professional or business men), that as a result of the arrival of the motor car vast numbers of people are now spread over the countryside who were previously in towns, and that the only method by which they can get from their homes to railway stations or nearest towns is by means of motors.

It is also pointed out that almost every user of a car or motor cycle is already being heavily taxed for the benefit of the State by the extra duty on motor spirit, and that a recent census of many thousands of A.A. members shows that 58% of their mileage referred entirely to business or professional work, 16% to voluntary war work, and 26% to private work.

On behalf of motor cyclists, it is shown that in some cases lightweight machines would have a greater taxable value than those of a heavier character.

## The New Motor Cycle Taxes.

At a special meeting of the General Committee of the R.A.C. held on April 11th the following resolution was put forward by Mr. T. W. Loughborough, secretary of the Auto Cycle Union: That, in the opinion of this committee, the proposed scale of taxation of motor cycles is misleading and inequitable, and that every effort be exerted to secure an amendment to the proposals, and to urge the adoption of a scale of taxation for motor cycles which, whilst proportionate to the duties to be paid by car owners, will operate fairly as between motor cycle owners of varying means.

## SPECIAL FEATURES.

HILL-CLIMBING FORMULÆ.

TWO-STROKE TIPS.

ARMoured CARS AND SIDECARS.

## Motor Cyclists and the Air Service.

A. S. Jones, of the A.S.C., M.T., writes as follows on recent topics discussed in these columns: "As an A.S.C. man receiving 6s. per day, I believe it is unfair. I have offered to transfer to the Royal Flying Corps, which would automatically reduce my pay to 2s. a day, but the request has been refused."

## Prices of Second-hand Motor Cycles.

In times of peace the six weeks or so preceding Easter see greater activity in the second-hand market than at any other time of the year. Now this does not hold good. As a result of the calling up of the single men for the Army there is a good selection of second-hand mounts, it being quite common to see the words "Owner called up" at the end of an advertisement.

## Signs of Easter.

The number of requests for routes we have received during the past fortnight, though not so large as in peace times, is sufficient to indicate that many motor cyclists will be using their machines for lengthy runs during the Easter holiday. Men engaged on munitions are endeavouring to get a few days' relaxation, in the form of a long week-end tour, after the winter months of hard incessant work.

## Baker's Records.

The following is a list of records that Erwin G. Baker, the American rider of a Powerplus Indian, claims to have made during his visit to Australia:

Twenty-four hours: 1,028 mls. 30 yds.—world's road record.

Eighteen hours: 876 mls.—world's road record.

Twelve hours: 576 mls.—world's road record.

Six hours: 315 mls.—Australian road record.

Five hours: 266 mls.—Australian road record.

Four hours: 215 mls.—Australian road record.

Three hours: 163 mls.—Australian road record.

One thousand miles: 21h. 3m.—world's road and track record.

Five hundred miles: 9h. 58m.—world's road record.

Three hundred miles: 5h. 35m.—Australian road record.

Two hundred miles: 3h. 41m.—Australian road record.

Hobart to Launceston, road record, 123 miles: 2h. 37m.

Oahu Island record, 90 miles: 2h. 4m. 36s.

The last-named refers to a run made by Baker in the Hawaii Islands on his way home to the United States.

**Another War Easter.**

Two motor cycle events are announced for this Eastertide. Compare this with Easter, 1914!

**Touring Guides' War Bonus.**

All R.A.C. touring guides are to have a bonus of 2s. 6d. per week added to their wages until six months after the declaration of peace.

**Complaints at the Heavy Taxes.**

Dozens of letters have reached us from motor cyclists complaining of the hardships imposed by the new motor cycle taxes. A further selection of letters relating typical opinions are given on pages 386 and 388.

**Munition Workers.**

Most motor cyclist munition workers will have to be content with one extra day's outing this Easter as a relaxation from their labours. No doubt some thoughtless people would deprive them of this one day if they could have their way. Such people are usually the kind who visit theatres and picture palaces regularly.

**The Clearing House.**

The information concerning Reg. Samson, who is now at Salonika, published in our issue of April 6th, has resulted in a parcel being sent him from Birmingham. Some of our readers will recollect a concert organised by Birmingham motor cyclists some sixteen months ago, the money received being spent in gifts for Midland riders on active service. Some trouble was experienced afterwards in getting into touch with some well-known men who had joined His Majesty's forces upon the outbreak of war. One of these was Reg. Samson, who, as stated, has now his parcel en route.

**American Journals.**

On the subject of the prohibition of imported motor cycles, *Motor Cycling* and *Bicycling* (Chicago) writes as follows:

"While the ostensible object of the British Government is to prevent the spending of money for luxuries, it is pretty well understood on this side of the water that the British motor cycle manufacturers have 'put one over' on the British motor cycle-riding public. It has been noted that American motor cycles have been supplanting the home-made product in the affections of the riders across the pond, therefore the English manufacturers, whose machines are commandeered for war purposes, or whose factories are devoted solely now to the manufacturer of war munitions, got the Government to stop the importation of American machines to save the British after-the-war market. This is a dog-in-the-manger act."

This, of course, is absurd.

The same paper has lifted the greater part of a photograph which appeared in a recent issue of *The Motor Cycle*. The inscription under this fragment reads: "English motor cycle battery with motor cycle rifles as escort; the kind we need in this country." The usual courtesy with which one journal should acknowledge extracts from another also seems to be a crying need in the country which is too proud to fight, but not, it seems, too proud to "requisition."

**Another Motor Cyclist Airman.**

Another leading motor cyclist to join the Royal Flying Corps is Ivan B. Hart Davies, of Rugby. The End-to-end record holder obtained his pilot's certificate two or three years ago, and was recently granted a commission in the R.F.C.

**The Birmingham Open Trial.**

The number of entries for the above trial now total 53. We do not give the route, as the officials are anxious to keep this secret in order to obviate competitors annoying inhabitants en route by practising. We are, however, able to say that the lunch stop will be at the Plough Hotel, Cheltenham, and the route includes several well-known test hills. This trial is no slackers' trial, as one of the regulations of entry is

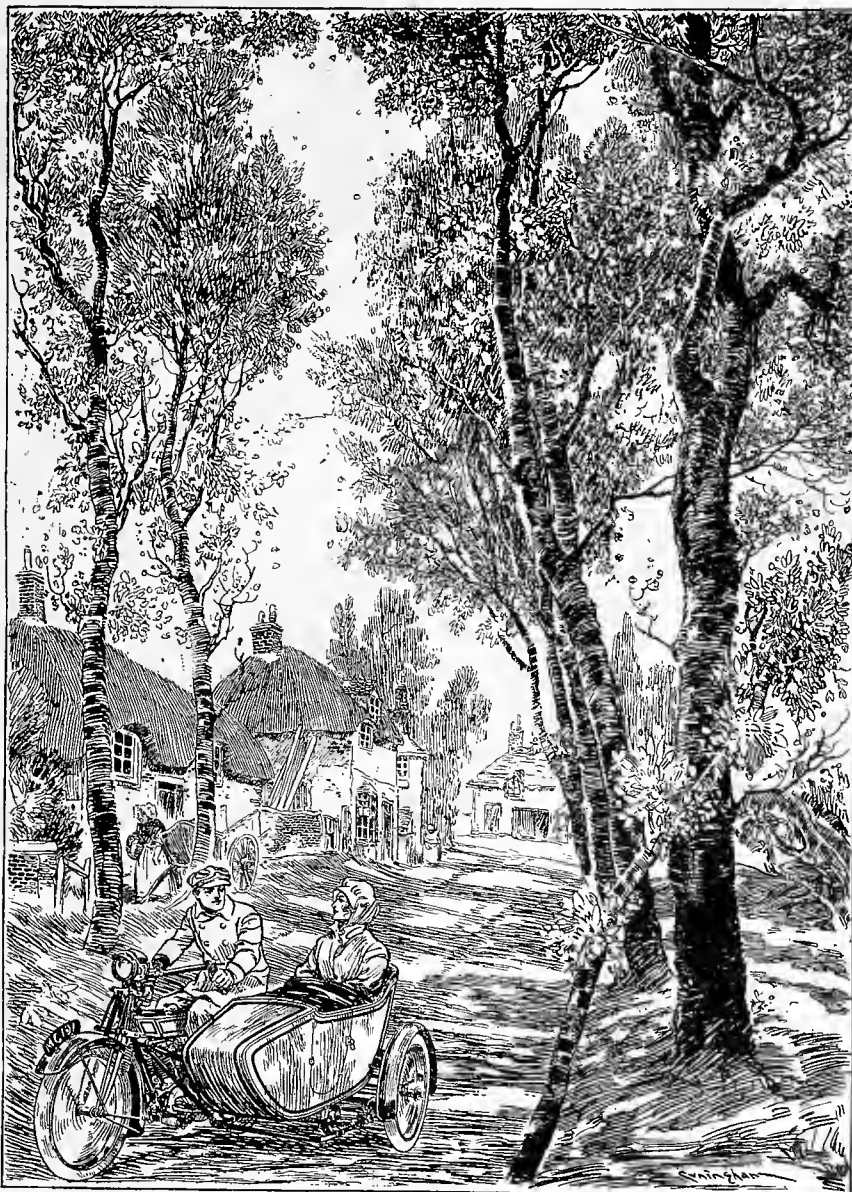
that no competitor may be a single eligible man. It is only open to ladies, service men, reserve men, munition workers, or those ineligible for military service. Full particulars and list of entries will be found on page 385.

**A Cheap Fuel.**

Next week's issue will contain an account of a careful test carried out with Binks fuel by one of our contributors, who experimented with much success on a 3½ h.p. P. and M.

**The Taxes—Good News.**

*The Motor Cycle* has received from the Chancellor of the Exchequer an acknowledgment of the letter published in our last issue, together with a promise that the scheme formulated by this journal shall receive consideration.



And he that will his health deny,  
Down among the dead men let him lie.—Dyer



# "THE MOTOR CYCLE" RECRUITING SECTION.

Central Office for Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

**A**MONG last week's recruits was a good number of single men who had hitherto been engaged in reserved occupations, but now released for service.

During the past week two inspections of recruits were held, one at Coventry on Tuesday and the second at London on Saturday last. Those motor cyclists and car drivers accepted for the M.M.G.S. are shown hereunder:

Allistone, H., Kilburn.  
Ashworth, G. V. W., St. Anne's.  
Baker, P. W., King's Lynn.  
Barker, R., East Ham.  
Barnes, A., Woking.  
Battell, J. W., Hornsey.  
Beaton, G., Stockton-on-Tees.  
Birley, W., Hull.  
Bradley, T., Totley.  
Brown, P. H., Sudbury.  
Burton, H., Peterborough.  
Buttle, A., Ramsgate.  
Candy, M. C., Booter.  
Carrington, A. S., Atherstone.  
Cartwright, W. H., S. Kensington.  
Chackett, H. S., Canook.  
Clark, G., Rugby.  
Clarke, J. W., Acton.  
Chase, W., Forest Gate.  
Comet, W. L., Lodon.  
Cormack, A., Wick.  
Cutler, L. W., Sutton Coldfield.  
Dales, A., Mookseaton.  
Edwards, E. W., London.  
Evans, H. A., Bournemouth.  
Freeman, F., Lewisham.  
Fuok, J., Sheffield.  
Gales-Wise, A. J., Marske-by-the-Sea.  
Gibson, N. F. W., Melton Mowbray.  
Gill, J. H., Hebben Bridge.  
Harper, F., Wednesbury.  
Haykios, F. F., Gateshead-on-Tyee.  
Hahner, A., Beigate.  
Hever, C. M. J., Eynsford.  
Hibbert, H., Sutton-in-Ashfield.  
Hitchin, F., Birmingham.  
Hobbs, L., Woolhampton.  
Holmes, E. W., Castleton.  
Jago, J., Woking.  
Johnson, A. G., Liverpool.  
Kaye, C., Sheffield.  
Kilburn, G. R., Dewsbury.  
Lane, E. A., Stratford.  
Lawson, A. C., Muswell Hill.  
Leeding, E. H., Peterborough.  
Lymer, H., Leeds.  
Marshall, H., Kearsall.  
Marshall, J., Bradford.  
Marston, W. G., Coventry.  
Mayers, C., Chester.  
Medhurst, W. S., Chobham.  
Middlehurst, E. S., Guildford.  
Miles, J. J., Stockwell.  
Moakes, A. C., Merton.  
Mortimer, A., Bradford.  
Moss, T. R., Fleetwood.  
Moss, W., Poulton-le-Fylde.  
Murgatroyd, C., Leeds.  
Newton, J., Heaton Moor.  
North, F., Bourne.  
Offord, A. W., Royston.  
Orsbach, M., Hammersmith.  
Pearson, A. H., Oxford.  
Phillips, G. R., Briton Ferry.  
Plumb, A., Billericay.  
Potts, S. A., Carlisle.  
Pottinger, M. W., Wantage.  
Prior, H., Leeds.  
Rennison, W. P., Seaton Delaval.  
Richardson, W. R., Kentish Town.  
Rogers, E., Sherwood.  
Rooke, A. E., Braham-on-Crouch.  
Rosier, L. C., Coventry.  
Rowlands, H. H., Egreymont.  
Rutter, H. M., Cambridge.  
Smith, W., Cirencester.  
Sowerby, C. S., Waltham.  
Spearman, J. W., Windsor.  
Spooner, F., Canook.  
Stephenson, J. A., Bridlington.  
Taylor, F. H., Canonbury.  
Tasker, J. O., Norton-on-Tees.  
Thompson, R. K., S. Tottenham.  
Thomson, A. J., Dewsbury.  
Thomson, R., Newcastle-upon-Tyee.  
Thornhill, G. H., Derby.  
Torge, H. T., Bolton.

Townsend, C. E., Sutton-in-Ashfield.  
Tyrer, W. A., Liverpool.  
Way, S. J., Camberley.  
Weatherhead, J., Patchley Bridge.  
White, E. A., Tettenhall.  
Wilkinson, P. L., Keighley.  
Williamson, J. J., Liphook.  
Woodward, T. R., Oxford.  
Worrall, L. H., Halifax.  
Yeardley, H. M., Tadcaster.

This week's appointments for the examination of recruits were at Coventry on Tuesday and Bristol yesterday (Wednesday). Lieut. H. N. Smith, R.E., made the arrangements at Bristol.

For the benefit of prospective recruits in the M.M.G.S., a list of inspections arranged in the different districts are given below. Mr. Geoffrey Smith, the Editor of *The Motor Cycle*, who is in charge of recruiting for the Motor Machine Gun Service, will be in attendance to test applicants, and will issue War Office acceptances to suitable men. There is no necessity to write. Experienced car drivers and motor cyclists who conform to the requirements enumerated on this page may present themselves at any of the addresses given.

BRISTOL.—Victoria Rooms, opposite Queen's Hotel, Wednesday, April 19th, 2.30 to 4 p.m.

MANCHESTER.—Messrs. Iliffe and Sons, Ltd., Century Buildings, 199, Deansgate, Wednesday, April 26th, 2 to 4.30 p.m.

LONDON.—The Motor Cycle Offices, 20, Tudor Street, E.C., Saturday, April 29th, 1.30 to 4 p.m.

The terms of enlistment in the M.M.G.S. are:

Pay, 1s. 2½d. per day, all found.

Enlistment for duration of war.

Usual separation or dependants' allowance.

Age limits, 19 to 40.

Applicants must be medically fit for General Service abroad or for Garrison Service abroad.

Applications still reach the Editor from men who desire to join "in three months' time," one actually mentioning October! Such forms should not be submitted, as nothing can be done for any enquirer who is not in a position to join up promptly.

Monday morning's post brought 123 applications for enlistment and particulars of the Motor Machine Gun Service.

In the latest list of recruits are included further men who have been on the waiting list of the Royal Engineers' Signal Section for some months past. Owing to there being no vacancies these men had been notified to join another section.

The total number of applications dealt with by Mr. G. Smith from motor cyclists and car drivers anxious to enlist in one or other of the different motor sections of the Army since the outbreak of war has risen to 8,435.



HILL-CLIMBING COMPETITION FOR KHAKI-CLAD MOTOR CYCLISTS.  
Working out results of the impromptu hill-climb held on Friday last by the Inns of Court O.T.C. at Toms Hill, Aldbury

# Monday's Service and Munition Workers' Trial.

Over Fifty Entries for the Birmingham M.C.C. Easter Event.

OVER fifty entries have been received for the Easter Monday trial of the Birmingham Motor Cycle Club. The list is given below, and it may be taken as practically complete, though there may be a few more additions. We are informed that practically all the entrants are Service men; of the remainder, the majority are munition workers and Derby men who have not yet been called up. No single men eligible for service will ride.

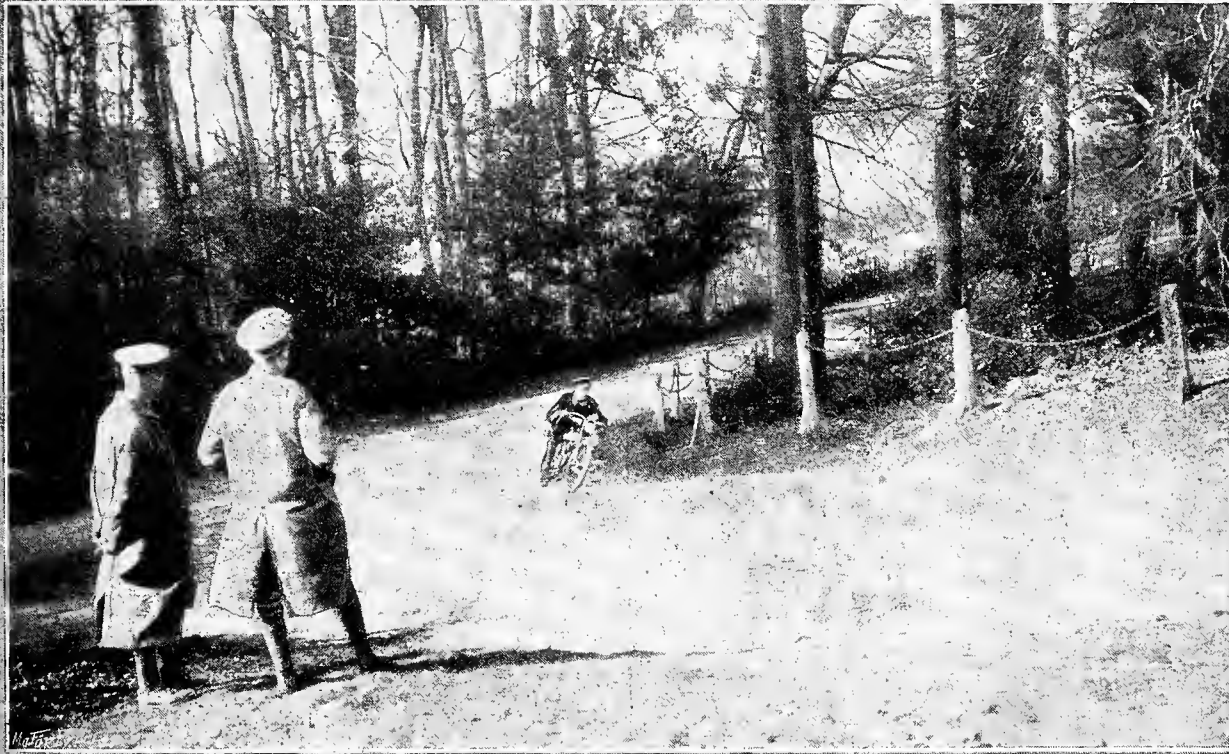
Many well-known names will be recognised from the list, and the trial is being looked forward to, by competitors and officials alike, as an opportunity of meeting old friends in a congenial atmosphere.

We have had an opportunity of examining the route card. The total distance of 146 miles embraces six well-known

hills, and there are six non-stop sections. Starting from the top of Griffin's Hill, Selly Oak, Birmingham, at 9 a.m., the first man is due to arrive at the Plough Hotel, Cheltenham, for lunch at 12.50 p.m.

D. A. Poole (4 Norton)  
T. Stevens (4½ James sc.)  
L. Clarke (4½ James sc.)  
E. Kibble (4 Triumph)  
E. W. Choldcross (3½ Sunbeam)  
A. J. Young (6 Sunbeam)  
Rev. J. M. Philpott (3 Enfield)  
R. F. Messeroy (8 Morgan)  
E. Kickham (3½ Sunbeam sc.)  
C. Percival (4 Douglas)  
J. N. Hill (5-6 Bat)  
J. Dndley (4 Sunbeam)  
W. Broadfoot (4½ James sc.)  
F. J. Cooper (6 Enfield sc.)  
C. Taylor (2½ Connaught)  
J. E. Rose (4½ B.S.A.)  
H. R. Davies (3½ Sunbeam sc.)  
G. Kuhn (2½ Lewis)  
G. F. Ammon (2½ Tyler two-stroke)  
C. Moss (8 Moss-Jap)  
J. E. Greenwood (4 Sunbeam)  
J. R. Alexander (7 Indian sc.)  
L. Naylor (6 A.J.S. sc.)

C. Naylor (4 A.J.S. sc.)  
A. J. Dowler (3½ Sunbeam)  
R. S. Coates (8 Sunbeam sc.)  
T. Coates (8 Enfield sc.)  
Rex Minndy (3½ T.T. Sunbeam)  
B. W. Harcourt (8 Rex-Jap)  
W. Heaton (4 A.J.S. sc.)  
W. Cooper (7 Harley-Davidson)  
H. J. Stretton Ward (3½ Rudge)  
C. B. Thompson (4 Douglas sc.)  
E. Johnson (4 Norton sc.)  
G. H. Ratcliffe (4 Norton sc.)  
J. Drew (4 Sunbeam sc.)  
E. Frasette (7 Powerplus Indian sc.)  
A. Mariani (7 Powerplus Indian sc.)  
Noel H. Brown (7 Powerplus Indian sc.)  
A. Milner (2½ Lewis)  
E. J. Gray (8 Zenith)  
W. D. Hawkes (—)  
Rider Troward (4 Triumph)  
G. Bell (7 Harley-Davidson sc.)  
W. H. Edwards (4½ James sc.)  
Miss Hough (8 Morgan)  
A. Birch (Douglas)  
P. G. Tomkins (—)  
T. Simister (4½ B.S.A.)  
H. Gilpin (6 A.J.S.)  
W. Barr (3 Enfield)  
B. Haddock (2½ Diamond)  
C. H. Poole (5 Indian)



The Inns of Court O.T.C. Regimental Hill-climb, announced for Friday last, did not materialise in the form expected, an impromptu event only being held. This illustration shows a rider of a Douglas climbing Toms Hill, Aldbury, during the impromptu competition.

## AN EXPERIENCED RIDER IN FRANCE.

A CHATTY letter we have received from F. Turner Denton, who went out to France just over twelve months ago, contains points of interest to our readers. Denton has done an amount of despatch riding, and has more than a good word to say of the Douglas and Triumph machines. His more recent

experiences have been as instructor at a base M.T. depot. Here newcomers from home are put through a course of driving and riding under active service conditions before taking up their work in the war zone, and Denton has been teaching such men the handling of W.D. model three-speed twin-cylinder Clyno sidecar outfits

under conditions that never prevail at home.

He considers that the gruelling motor cycles get on active service and the continual practice the riders have on "impossible" roads will result in both vastly improved machines and more competent riders after the war.

# MOTOR CYCLE TAXATION.

## MORE READERS' OPINIONS OF THE INJUSTICE OF THE NEW TAXES.

Sir,—With regard to the proposed new taxes on motor cycles, does it not seem unjust that a man riding to work on an old machine—costing about £10—should be made to pay the same amount of taxation as the man with a £100 turnout?

Machines taxed according to their value or some kind of graded tax would be the only fair way.

Could not this matter be brought to the notice of Mr. McKenna?  
OLD STAGER.

Sir,—Having read with interest the articles and letters on the new taxation, may I state my own case?

I am a young business man, married eighteen months, in business six and a half years, worked up from nothing and without capital. A small branch line only connects the town by rail to the main line—useless for covering the district, as I often have to do on my photographic business. Traps are scarce and slow, and cost much to hire. In many cases my apparatus is too heavy to carry on a cycle, apart from the fact of arriving at my destination puffed and dusty. The only vehicle "hirable" is a car, which is to say the least expensive. In wartime we are told to economise, so I get a motor and sidecar. I have been plotting and scheming for it for months; it is the thing for my purpose, but ways and means did not allow until a few weeks back. Now, down comes the extra tax, and the probability is that I shall have to give up the machine. Yet the fact remains. I buy a mount, for business purposes, second-hand at £26 (and no easy matter then), and have to pay the same tax as a man who buys an expensive outfit of same horse-power at £80 to £100, and of the two, who is likely to do more pleasure riding?

No, I certainly agree with your other readers (and there are many in my position); a practical man was *not* consulted in drawing up this Budget!—or part of it.

### BUSINESS 'FORE PLEASURE.

Sir,—I, as one who will be hard hit by the tax, and own a motor cycle for getting out in the open at the weekend, should like to say a word or two on behalf of working men who have invested their money in motor cycles. I think that the best way to raise money is to put a tax on all spirit or petrol used for propulsion. Thus all who travel on the highway will pay their fair share, and not hide under the cloak of business and commercial use. Those that travel most will pay most. I, like many others that I know, will have to store my mount, for I cannot afford to pay this extra tax. I think that you might print a protest form in your paper so that we could fill it up and send it to Mr. McKenna.

### WEEK-ENDS.

Sir,—I am glad to see *The Motor Cycle* has seriously taken up the matter of excessive taxation on motor cycles, and I beg to thank you as a motor cyclist of many years' standing. The taxes as proposed are nothing less than an imposition, and they must put a damper on motor cycling, which is certainly wrong. What sport and industry have furnished flying men, A.S.C. and M.M.G. units with material such as has been recruited from us? How many men knew they had any mechanical proclivities until they handled a motor cycle? Surely this excessive taxation must kill the goose that lays the golden eggs. £2 2s. as a minimum is out of all reason, as hundreds of machines change hands at £10, and it is with this machine that the novice learns more in two months than he would in two years with an up-to-date machine.

A case in point. I was about to purchase a machine for my son (aged 17), so that when he has to "join up" he may qualify for the R.F.C. or D.R.'s. The new taxation, however, has put this quite out of the question, as I cannot submit to a 3 guineas tax on a £10 machine, although I claim to be patriotic.

Why the pedal cycle should not bear some of the burden I cannot understand. We possess three in our family, and would not object to a reasonable tax on them.

In conclusion, what industry is doing more for the country than the motor cycle makers? A record will no doubt be available some day of the amount and quality

of the munitions made by them, which work they are doing wholeheartedly, the while they have seen their business simply walked into and picked up by our *soi-disant* American cousins, gratis.  
JOHN J. LEONARD.

Sir,—I have read your letter to Mr. McKenna in last week's *Motor Cycle*. In my opinion £4 14s. 6d. is too much for any motor cycle, no matter what size the engine, and with or without a sidecar. £1 in peace time and £2 in war time is ample. Perhaps you remember it was proposed to increase the taxation some three years ago, but after investigation the matter was dropped. The rich man has his tax trebled, the poor man with a motor cycle of 8 h.p. quintupled nearly. Why?

Take my own case. I have an 8 h.p. machine and sidecar six years old. I bought it four years ago for £55. My running expenses, excluding depreciation, are about £10 per annum. Although my income is over £400 per annum, I cannot afford anything like £4 14s. 6d. tax, especially with petrol so dear. I do practically all my own repairs. My machine never goes to a garage. My ability to pay tax can be measured by the amount I can afford to spend, viz., £10. I cannot afford any more.

Why should expensive pianos, horse keepers for pleasure, etc., be untaxed, and a man who can afford a miserable £10 only per annum on recreation for three people be charged five times? In fact, why should he be taxed any more? Increase in income tax and cost of living is quite enough. Ten shillings for Auto-wheels, £1 for nominal 3½ h.p., £1 10s. for 6 h.p., and £2 for 8 h.p. is quite enough.

### INDIGNANT.

Sir,—It is not often I take up my pen to write to a paper, but I feel I certainly must do so now. May I quote my case?

Before war broke out I was a Territorial, and on mobilisation I immediately, with the greater majority of my pals, volunteered for active service. Within three months of the outbreak of war the battalion was in France fighting at Ypres. After three months' fighting I was unfortunate enough to try conclusions with a shrapnel shell, the latter coming off an easy first, and the next ten months I spent in hospital, where my leg was just saved from amputation. The nett result is that I am lame, if not for the rest of my life, certainly for the next twenty years.

Now comes the grateful country's return. I could have taken my discharge from hospital as permanently unfit, but feeling I could still do a little more, and possibly free a fit man for service abroad, I made application to be kept on, and was then sent here to the second line. I can walk, roughly, one mile; possibly two. The camp is three or four miles from anywhere, in a very hilly country, where it would be practically impossible for me to get out far, much less to the station five miles away, were it not for the fact that with the small amount of money that I had managed to save for a machine in pre-war days and the money due to me on my discharge from hospital I managed to get a small 2½ h.p. two-stroke machine (second-hand) with which to potter around a bit, and, incidentally, get a little fresh air now and then. By the way, is this pleasure motor-ing? With everything going up, bar our shilling a day (although I freely admit I get a little more than that), it made things rather difficult to manage, what with £1 Inland Revenue licences, 5s. driving licence, petrol (when obtainable) 2s. 7d. per gallon—more if the retailers could get it—I could not afford to insure.

Still, things were not so bad, and we were not grumbling until the kind Chancellor of the Exchequer saw fit to more than double our taxes, making the wounded Tommy's baby machine pay, comparatively, twice as much as the "millionaire's 60 h.p. car"!

I trust you will excuse this lengthy effusion, but I feel rather strongly on the matter, and I am certain there are many others in the same position as myself, and if matters keep on as they are we shall soon have indefinite "C.B." as it will be impossible to keep our machines. I speak more or less, from actual experience, as there are several others in this camp alone.  
LANCÉ-CORPORAL.

## Average Prices OF Second-hand Machines.

WE give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted, otherwise the last average is given, if within five weeks.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.B.C.	1915	3 1/2 4-speed	£63	—
A.J.S.	1915	6 3-sp. sidcar	£91	—
"	1914	6 3-sp. sidcar	£72	—
"	1912	6 3-sp. sidcar	£44	—
"	1915	2 1/2 3-speed	£47	—
"	1915	2 1/2 3-sp. T.T.	£50	—
"	1914	2 2-speed	£39	—
Allon	1916	2 2-stroke	£36	—
"	1915	2 2-stroke	£31	—
Bat	1914	5 3-sp. sidcar	£53	—
"	1913	6 2-sp. sidcar	£32	—
Blackburne	1915	3 1/2 3-speed	£53	—
Bradbury	1914	4 3-sp. sidcar	£41	—
"	1914	6 3-sp. sidcar	£59	—
"	1913	4 sidcar	£32	—
"	1913	4 2-speed	£26	—
B.S.A.	1915	4 1/2 3-sp. sidcar	£62	—
"	1914	4 1/2 3-sp. sidcar	£50	—
"	1913	3 2-sp. sidcar	£37	—
"	1915	4 1/2 3-sp. sidcar	£47	—
Calthorpe	1915	2 2-speed	£26	—
"	1914	2 2-speed	£16	—
Campion	1914	6 sidcar	£51	—
Clyno	1914	6 3-sp. sidcar	£63	—
"	1913	6 3-sp. sidcar	£33	—
"	1912	6 2-sp. sidcar	£45	—
Cov. Eagle	1915	2 2-stroke	£25	—
Douglas	1915	2 3-speed	£45	—
"	1915	2 3-speed	£43	—
"	1915	4 3-sp. sidcar	£59	—
"	1915	2 1/2 T.T.	£40	—
"	1914	2 2-speed	£36	—
"	1914	2 2-sp. T.T.	£35	—
"	1913	2 2-sp. kick start	£34	—
"	1913	2 2-sp. T.T.	£31	—
"	1913	2 2-speed	£38	—
Enfield	1916	6 2-sp. sidcar	£79	—
"	1915	2 2-sp. sidcar	£74	—
"	1915	6 2-sp. sidcar	£64	—
"	1914	6 2-sp. sidcar	£61	—
"	1913	6 2-sp. sidcar	£47	—
"	1912	6 2-sp. sidcar	£39	—
"	1915	3 2-speed	£39	—
"	1914	3 2-speed	£35	—
Excelsior (A)	1915	7 3-speed	£50	—
H. Davidson	1915	8 3-speed	£67	—
"	1915	8 3-sp. sidcar	£68	—
Henderson	1915	4-cyl. sidcar	£80	—
"	1913	4-cyl.	£29	—
Hobart	1915	2 2-stroke	£30	—
Humber	1914	2 3-speed	£26	—
"	1913	3 1/2 2-sp. sidcar	£33	—
"	1912	3 1/2 2-sp. sidcar	£26	—
"	1911	3 1/2 2-sp. sidcar	£22	—
Indian	1915	7 3-sp. sidcar	£75	—
"	1915	7 T.T.	£48	—
"	1915	5 3-speed	£50	—
"	1915	5 3-sp. sidcar	£65	—
"	1915	3 1/2 3-speed	£48	—
"	1914	7 2-sp. sidcar	£54	—
"	1914	7 2-speed	£47	—
"	1914	7 2-sp. T.T.	£38	—
James	1915	3 1/2 3-speed	£48	—
"	1914	4 1/2 3-sp. sidcar	£47	—
"	1913	4 1/2 3-sp. sidcar	£40	—
"	1915	4 1/2 3-sp. sidcar	£64	—
Lea-Francis	1914	3 1/2 2-speed	£48	—
Levis	1915	Popular	£23	—
Matchless	1914	8 3-sp. sidcar	£71	—
"	1913	8 2-sp. sidcar	£36	—
"	1915	8 3-sp. sidcar	£88	—
New Hudson	1916	6 3-sp. sidcar	£61	—
"	1915	2 1/2 2-speed	£29	—
New Imperial	1915	2 1/2 2-speed	£26	—
Norton	1915	3 1/2 T.T.	£46	—
P. & M.	1914	5 1/2 2-sp. sidcar	£60	—
"	1913	5 1/2 2-sp. sidcar	£33	—
"	1915	3 1/2 W.O.	£59	—
Premier	1915	3 1/2 3-speed	£44	—
"	1914	2 1/2 3-speed	£20	—
"	1913	3 sidcar	£34	—
"	1914	3 1/2 3-sp. sidcar	£50	—
Quadrant	1914	4 1/2 3-sp. sidcar	£46	—
Rex	1913	6 2-sp. sidcar	£40	—

Make.	Year.	H.P.	Average for last week.	Latest weekly average obtainable
Rover	1915	3 1/2 3-sp. sidcar	£63	—
"	1914	3 1/2 3-sp. sidcar	£42	—
"	1914	3 1/2 3-speed	£38	—
"	1913	3 1/2 3-sp. sidcar	£34	—
Royal Ruby	1915	2 1/2 2-stroke	£22	—
Rudge	1915	3 1/2 multi T.T.	£52	—
"	1914	3 1/2 multi sidcar	£44	—
"	1914	3 1/2 multi	£36	—
"	1913	3 1/2 multi	£29	—
"	1913	3 1/2 multi sidcar	£34	—
"	1912	3 1/2	£25	—
Scott	1914	3 1/2 2-sp. sidcar	£52	—
"	1913	3 1/2 2-sp. sidcar	£38	—
Sunbeam	1915	3 1/2 3-sp. sidcar	£69	—
"	1915	3 1/2 3-speed	£59	—
Triumph	1915	2 1/2 2-sp. 2-stroke	£36	—
"	1915	4 3-speed	£41	—
"	1914	4 3-speed	£41	—
"	1914	4 3-sp. sidcar	£53	—
"	1913	3 1/2 3-speed	£32	—
"	1913	3 1/2 3-sp. sidcar	£43	—
Williamson	1914	8 2-sp. sidcar	£70	—
Wolf	1914	2 1/2	£13	—
Zenith	1914	6 Gradua sidcar	£52	—
"	1913	6 Gradua	£38	—
"	1913	8 Gradua sidcar	£52	—

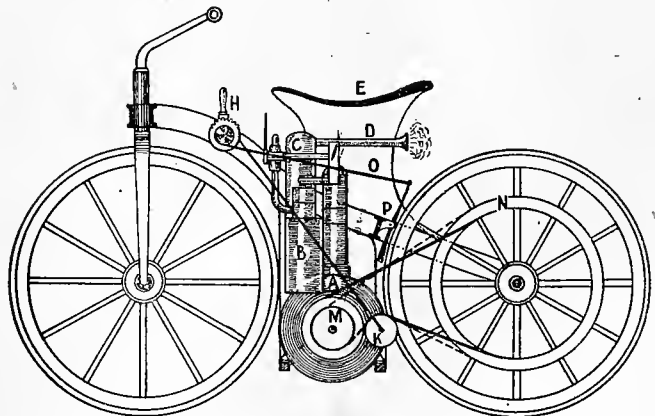


A well-made pair of riding gauntlets sold by Grose, Ltd.

## MOTOR CYCLE DESIGN IN 1885.

THE ancient motor bicycle illustrated was built by Gottlieb Daimler in 1885, and was the forerunner of all road vehicles propelled by internal combustion engines. The original idea of an explosion motor occurred to Philippe Lebon, but nothing much was done until another Frenchman, Lenoir, actually built a gas engine in 1861. Then no more was done until Daimler built his first motor bicycle. It is interesting to note how the machine follows the form of the early bone-shaker, and yet is modern, in that it has a vertical engine and belt drive with two speeds.

We wish to thank a Swiss reader, M. Bense, of St. Gall, for sending us the original.



A MOTOR CYCLE OF 1885.

An extremely quaint, compared with present-day ideas, design of Gottlieb Daimler.

A. Engine. B. Carburetter. C. Exhaust box. D. Exhaust pipe.  
E. Saddle. M.N.K. Belt transmission. H.O.P. Brake mechanism.

## USEFUL GAUNTLETS.

WE have lately examined a pair of motor cyclists' gauntlets, which are the idea of Mr. H. G. Grose, of James Grose, Ltd., 4, Old Jewry, Cheapside, E.C. The palms are of thick leather, and spaces are provided for the thumb and first finger. The lining is of lamb's wool. The upper part of the thumb, the joint between the fingers, and a portion of the lower part of the wrist is composed of soft leather, so as to render the gauntlets flexible. The back of the glove is made of heavy waterproof twill, as is also the part extending over the wrist and some distance up the arm, the latter being stiffened by means of pieces of cane.

## ADAPTABLE DESPATCH RIDERS.

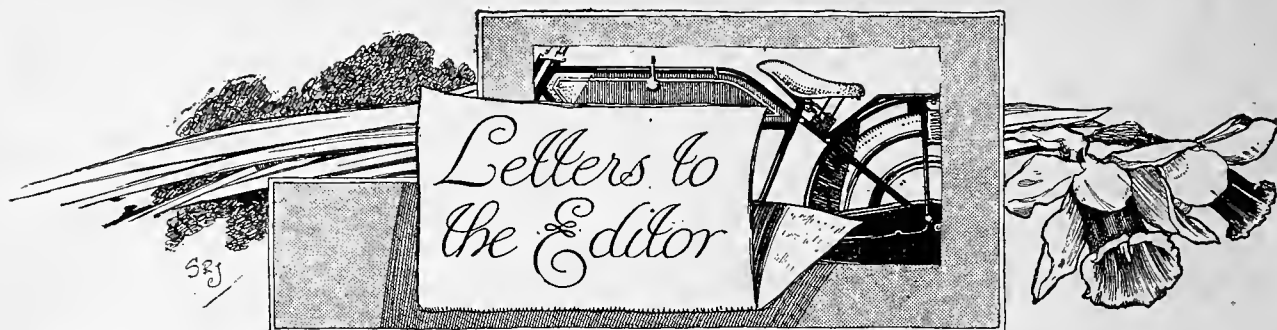
THE following is an extract from an amusing letter we have received from four R.E. despatch riders in training in the Midlands, and who have been assisting G.P.O. authorities in restoring telegraphic and telephone communication:

"After one week enduring the drill-sergeant's gnash our squad was passed as proficient in foot drill, and we are now detailed in groups to assist the postal and railway officials in restoring and repairing the wires and lines destroyed in the recent blizzard. Our work is seven days a week, from early morn to dewy eve, and we are as happy as crickets. We act as labourers to the more skilled men. The work is, as pointed out by our regimental sergeant-major, of the utmost national importance, and, although very laborious and at times monotonous and irksome, our high spirits have never yet failed us.

"Instead of motor cycles we handle the pick and spade, and our control wires are not of the approved Bowden type, but large drums of thick gauge copper telegraph line. There is not a man in the squad that would accept his discharge even with £100 bounty.

"Our squad 'nut,' who boasted lily-white hands and beautifully manicured nails, now has hands which might grace those of a life-long navy."





The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

#### Paraffin as a Fuel.

Sir,—After reading the letter by "FE 535" in your issue of March 30th on "Paraffin," I feel it would be of great interest to the community at large if he would give rather fuller details of his instrument, which gives all the advantages he claims, as in these times, when petrol is difficult to obtain at any price, and is getting steadily worse in quality in spite of rising price, a substitute fuel is particularly acceptable.

EO 293.

#### Some Firm.

Sir,—Noticing an engine thump of increasing magnitude in my 1915-16 Enfield, I took the machine to Enfields, Holborn Viaduct, and suggested it might be gear trouble, whereupon the company agreed to locate the fault and let me have the machine within two hours. Calling back ten minutes under this period, I found the last nut just being tightened.

But this is the wonderful part of the affair. It was not the gear at all, but a side bush in the crank case that had gone. So it amounts to this: My engine had been totally dismantled, new side bush fitted, and re-assembled ready to drive away in 1h. 55m., as agreed. To the very efficient mechanics at the Enfield London depot I take off my hat; to the firm, my very best thanks.

D. E. TURNER.

#### Top Feed Carburetters.

Sir,—I am surprised to read that such an expert motorist as Capt. Lindsay should, apparently in haste, jump to such a wrong conclusion from the evidence he mentions and unfairly condemn top-feed chambers off hand. Surely the correct inference to be drawn is that by the time he had ridden the first fifty miles or so most of the dirt and odd debris, which is almost invariably to be found in the tank of every new machine, had come down through the petrol pipe, and consequently he had no trouble with the bottom-feed instrument, *not* because the design and working are better, *but* because the source of the trouble had been removed. If the bottom-feed instrument had been on in the first place exactly the same trouble would have occurred, assuming, of course, that the gauze area was the same in both instruments, as, of course, a large gauze is much better than a small one; but the discussion is not as to whether a filter should be fitted or not—in the writer's opinion a suitable large area petrol strainer should always be fitted between the carburetter and the petrol tank—but as to advantages and disadvantages of feeding the petrol in at the top or bottom.

TOP FEED.

#### Motor Cycle Taxation.

Sir,—I am greatly interested in the proposed new taxes on motor cycles, outlined in your last issue. I suppose it means that the owner of a featherweight twin will in future have to pay a tax of over £3 per annum. Such machines are usually, as you know, the property of the person of limited means, who chooses his machine with a view to economy in petrol, tyres, and first cost.

On the whole, I think machines of, say, under 70 mm. bore should not be taxed more than at present, as I believe the Exchequer will lose more than it will gain by it. The

man with the light purse will scrap his machine in most cases rather than pay over £3, no matter how patriotic he may be. Three owners of lightweights to whom I have spoken on the subject say they intend to give up motor cycling, as they cannot pay the tax.

JOHN MACALLISTER.

Sir,—I think a great many of your readers will read with interest the comments in *The Motor Cycle* on the new taxes affecting higher power machines. The big jump from £1 to £3 3s. on a 6 h.p. machine, taken in conjunction with the high prices now prevailing for fuel, is going to tell particularly hardly on those small tradesmen who are purchasing their machines by the hire-purchase system and who already have been hard hit by the war and have the greatest difficulty in keeping up their payments. *Double* the tax (to my mind) should have satisfied the most rapacious Chancellor.

SIX HORSE.

Sir,—As a constant reader of your valuable paper, *The Motor Cycle*, I venture to enquire whether the attention of the "powers that be" has been drawn to the unhappy position of the owners of "sporting" motor cycles under the proposed new taxation.

I refer to the enormously increased tax on machines of over 4 h.p. The authorities have apparently overlooked the fact that there are a number of motor cycles in use of over 4 h.p. to which it is impracticable, if not impossible, to attach a sidecar, but whose owners will have to pay the tax which is presumably intended for the owners of the modern luxurious "family outfits."

In my case I own a "sporting" twin of nearly 1,000 c.c., which has no gears, or even clutch. Such a machine is quite unsuited for sidecar work, but makes a splendid solo mount for a skilled country rider in a hilly district.

It seems unjust that A will have to pay 25% higher tax for his well-worn solo machine than B, who owns a £90 6 h.p. sidecar outfit, and still more so if A uses his machine solely as a necessary means of accomplishing unavoidable journeys in difficult country.

A.R.V.B.

Sir,—As I live miles away from anywhere, and in a very hilly county, anything of less power than 6 or 8 h.p. is no good to me. My machine is indispensable to me, but on account of the prices and scarcity of petrol, etc., I have to use it as little as possible. My present annual mileage being quite small, the cost of running per mile under the new tax will probably work out from 4d. to 6d. Surely an increase of tax from £1 to £3 would be ample, the same as the high-powered cars.

Trusting that the motor cycle associations will take the matter up,

HERMIT EMPLOYED UNDER GOVERNMENT.

Sir,—In view of the proposed increased taxation on motors, a point occurs to me that may be of general interest. It may perhaps be most easily put by taking my own case.

My machine is a 2½ h.p. Douglas, and if, as appears likely, it will have to bear a tax of £3 3s., it would be more than I would feel justified in spending in such a way at the present

time. Will discontinuing the use of the cycle, or if need be getting rid of it, free me from payment of the additional tax when it is demanded this year? [Yes. See page 350 of our last issue.—ED.]

Further, under the old tax I was granted a licence which only expires at the end of the year. When the powers that be go back on their word, so to speak, and cut down the time by almost one-half, are we not, in fairness, entitled to a rebate on the original payment?

The point at issue in this particular case is of no great moment, but it may well be so to many users of the more powerful outfits, and especially so to car users.

ESELLE.

Sir,—It appears that makers must now bestir themselves to provide engines which will escape as much taxation as possible. Cylinder bore must not exceed 80 mm., so a long stroke is required to give the necessary cubic capacity. I suggest 80 × 120 mm. as very suitable dimensions for the usual medium power sidecar outfit, giving a capacity of about 600 c.c. The tax would be £2 2s. Incidentally, Nortons fit in rather well with their 79 × 100 mm. and 82 × 120 mm. engines. The latter could, no doubt, easily be turned out bored 2 mm. less. Perhaps machines already in use could have a liner fitted to the cylinder, reducing the bore to 80 mm. As the valves remain the same, the loss of power will not be too great, e.g., my 1913 James is 86 × 96 mm., giving 558 c.c., and would become 80 × 96 mm., giving 483 c.c.

W. R. DEUCHAR.

#### Handle-bar Clutches.

Sir,—I quite agree with "Ixion" that a stiff handle-bar clutch leaves something to be desired, but for my own use I would prefer a handle-bar clutch of poor leverage to a foot pedal of the everyday kind.

"Ixion's" comments on my notes refer particularly to the handle-bar clutch on heavy solo mounts, and his objection is that the effort required to disengage a handle-bar clutch of bad leverage causes a temporary derangement in the steering. To be truly judicial, however, we must not point out a common weakness in one system without contemplating the counterbalancing weaknesses of the other, and the ignorance many manufacturers display in the arrangement of clutch pedals far outweighs their "ignorance as to the simplest laws of leverage" as exemplified in the design of handle-bar clutches. On three machines I have recently ridden it was necessary completely to remove one's foot from the rests in order to manipulate the clutch, and this sort of thing interferes with the steering far more considerably than the act of hauling out a stiff handle-bar clutch. If, indeed, the handle-bars are of the semi-T.T. type, a bad spill or bruised knee cap may result.

"Ixion's" remarks lead me to wonder whether he has ever visited these northern hills since trials ceased, and whether he ever threads an intricate way through the traffic of Birmingham or London on any mount more formidable than his baby two-stroke. If he were half so familiar with mountain roads, closed gates, and greasy city sets as I am he would vote for any old handle-bar clutch rather than one of the pedal variety. Stopping and starting in dense traffic is, in my opinion, a most tricky business when one is dependent on a foot clutch. While stationary one foot must be kept on the pedal, the other being placed on the ground for support, and when it comes to moving slowly forward again the merest wobble in the wrong direction compels the rider to remove his foot from the pedal to regain balance, and the result of the clutch going in with a "wallop" is usually embarrassing. In starting off on a steep gradient the same applies, and it is in starting on hills and in traffic that clutch control is most valuable.

Therefore, whilst appreciating "Ixion's" criticism, I contend that the slight temporary derangement in the steering to which he objects is far more commonly experienced through badly designed pedal control than it is through badly designed handle-bar control, and, granted that there are "duds" in both instances, I further contend that the pedal system entails such enormous disadvantages (particularly in the case of the heavy solo mount) that the handle-bar system is generally to be preferred.

H. M. BATTEN.

#### An Enthusiastic Family.

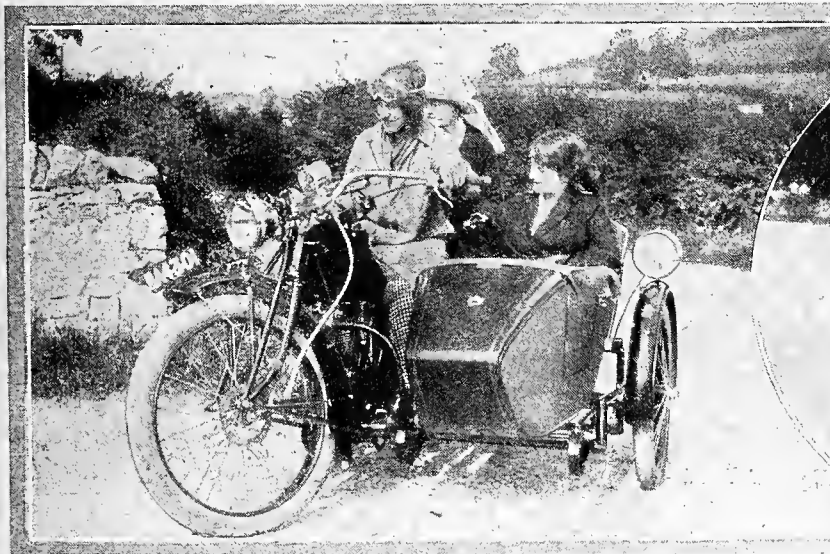
Sir,—I thought that perhaps these two photographs, which were taken last August, might be interesting to the readers of that really top-hole journal, *The Motor Cycle*.

Prior to the war, and before I joined the Artists', I was one of that army of men whose sole delight is to have an engine under them, and these ladies—two of whom are my aunts and one my sister—were as keen as myself. For the time being we have temporarily abandoned motor cycling owing to the war. Meanwhile we are all looking forward to that day when we will be able to resume our favourite pastime. The old 'bus also awaits the day on its stands and loaded with grease.

In conclusion, I may say that I got the old 'bus in July, and ran it continuously till the end of November without the least trouble or involuntary stop, except a few punctures. My mileage was over 6,000. The motor cycle has still the original tyres, plugs, etc., and its consumption was 65-70 miles per gallon.

I am also one of the upholders of the grip control. I think there is nothing like it, and that it should be adopted as standard.

DENIS R. MULLAN (Cadet, Artists' Rifles).



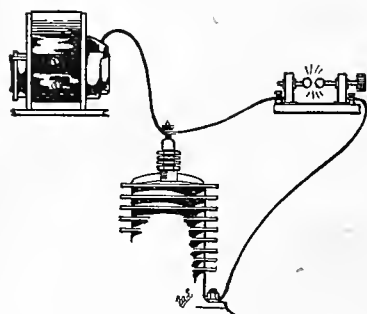
The 7-9 h.p. 1915 Indian and sidecar referred to in the letter on this page from Cadet Denis R. Mullan.

### Voltage at Sparking Plug Points.

Sir,—In *The Motor Cycle* of March 30th, under "Questions and Replies," "J.G." asks about the voltage at the points of the sparking plug, and your reply gives a figure of 8,000 to 12,000 volts. No very accurate figure can be given, as the voltage varies owing to a number of different causes, but we should consider your figure rather high, and would suggest about 5,000 volts as being more roughly correct. As this question may be of interest to several of your readers, we give below our reason for suggesting this figure.

It has been found experimentally that at atmospheric pressure it requires 33,000 volts to jump a spark gap of one centimetre between polished brass balls one centimetre in diameter, and also that within limits the necessary voltage varies in direct proportion to the length of the spark gap. If smaller knobs are used, a slightly less voltage is required to jump the spark gap; while if the pressure is increased above atmospheric pressure a greater voltage is required.

The best way to make a rough measurement of the voltage at the sparking plug points on a motor cycle is, with the



Testing the voltage at plug points.

ignition connections as usual, to connect an alternative spark gap to earth from the terminal of the sparking plug. This spark gap should consist of two polished brass balls, each ball being about one centimetre in diameter. The knobs should be placed well apart and the engine started up. The knobs can be gradually brought closer together until at a certain position the spark sometimes occurs at the external spark gap and sometimes at the plug points. When this occurs it shows that the resistance of the external spark gap in air and of the plug gap in compression are approximately equal. Usually the distance between the knobs of the external spark gap will be about  $1\frac{1}{2}$  mm., which, on the basis of 33,000 volts to a centimetre, indicates about 5,000 volts.

This voltage corresponds to a spark gap at the plug points of the usual  $\frac{1}{2}$  mm., but if the sparking plug points are set wide apart, then the voltage will be higher, while if the sparking plug points are set closer than  $\frac{1}{2}$  mm., the voltage will be lower than 5,000 volts.

THE LODGE SPARKING PLUG CO., LTD.

### Motor Attachments.

Sir,—"Ixion's" article under "American Advertising" in your issue of March 23rd would lead one to believe that the Auto-Wheel is the only attachment on the market which may with safety be attached to an ordinary push-bicycle, and that the ordinary cycle frame should be strengthened before fitting even the weakest of motor sets. Now as this is likely to prejudice the reputation of the J.E.S. 1 h.p. four-stroke motor attachment, I hope to be allowed to say a few words in defence.

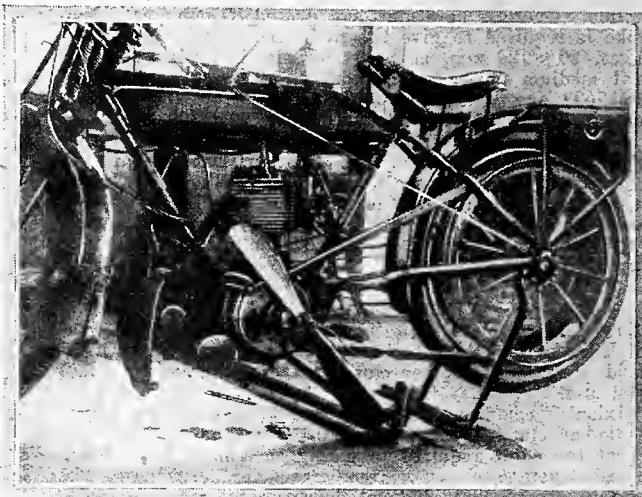
No person is in a position to say definitely that a medium quality push-bicycle frame is or is not strong enough to carry an engine such as, say, the J.E.S. without having proved it by actual tests. Whether "Ixion" has carried out such tests remains for him to say. Personally, I have no hesitation in saying that a medium quality push-cycle with a J.E.S. fitted, and with front fork stays added, is as safe as the ordinary motor cycle. Of course, no one would expect me to say anything against my own production; therefore I would like to point out that my claim is based on the actual experience of private owners since 1909, when the first J.E.S. was put on the road, and of the many hundreds of these attachments which have been sold not one single case of a broken frame has come to my notice, and I know of a few local riders who have travelled many thousands of miles. In one case the rider is 15 stone weight, and had his old push-cycle fitted with a J.E.S. in 1912, and has travelled well over 12,000 miles; his machine is now as good

as ever. Now I ask is it right, in view of such convincing proof, to hint that such a combination is unsafe?

J. E. SMITH.

### A Novel Use for a Motor Cycle.

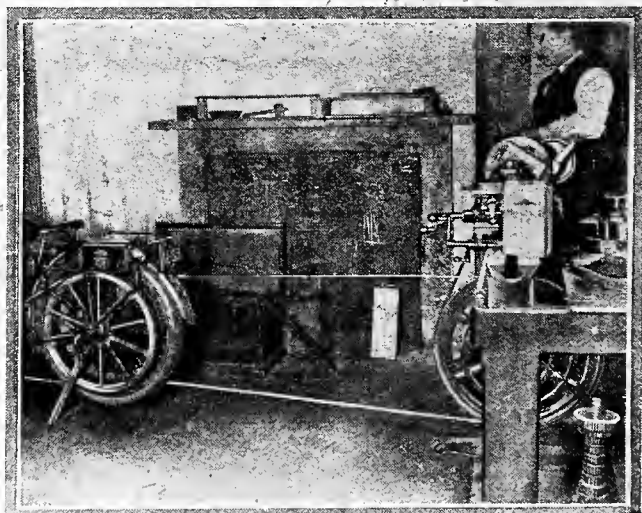
Sir,—I think I have rather a novel use for my motor cycle during the time when I am at school and am not allowed to use it. The machine is a  $3\frac{1}{2}$  h.p. Ivy-Precision with a three-speed Sturmey-Archer hub gear. The brake rim is fixed to the right side of the wheel, while the brake works on the outside of it. The inside of this is used as a belt rim, with a cord drive to the lathe in our metal shop. Attached to the pulley by means of a chuck is a 2ft. aeroplane propeller.



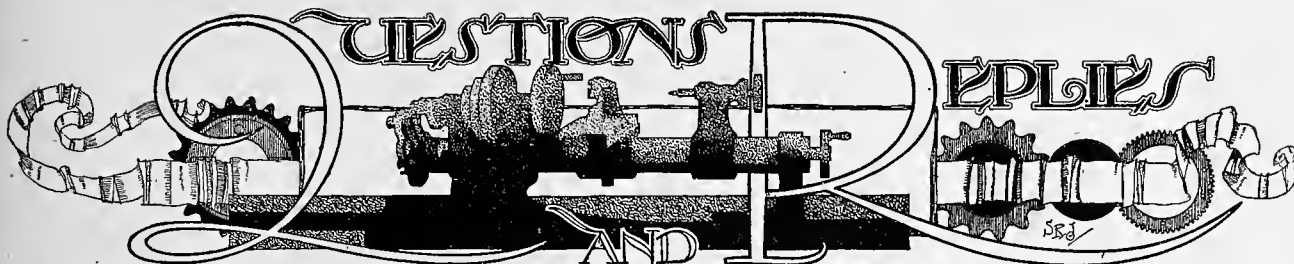
How our correspondent, A. K. B., arranges for the cooling of his motor cycle engine when it is driving a lathe.

As petrol is so expensive, I have removed the float chamber, and have attached the coal-gas supply to the rest of the carburetter (an Amac). After several experiments it was found that combustion did not take place unless the extra air was stopped up. The carbon deposit was decreased, as was also the exhaust, which was led away by an iron pipe. Starting is extremely easy, for as soon as the gas is turned on and a slight swing given to the belt rim (the belt rim being separate from the wheel) the engine fires immediately. The power is about four-fifths of that given by petrol.

A.K.B.



Motor cycle driving a lathe. (See letter from A. K. B.)



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy, for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

#### Local Taxation Licence.

**Q.** I purchased a 2½ h.p. motor cycle second-hand in July last. The £1 tax for 1915 had already been paid by the former owner. Would you kindly let me know if I have to pay the tax for 1915 over again, as the secretary of the County Council demands payment?—J.H.A.

The local taxation licence applies to the owner and not to any particular machine. You are therefore liable for last year's tax.

#### Regulating Mechanical Lubricator.

**Q.** My machine is a 1915 3 h.p. twin, Amac carburetter, mechanical force feed lubrication. (1.) I find that by turning the oil tap at the bottom of the glass reservoir on fully, viz., about five half turns, I over-lubricate. Result—sooted plugs and considerable smoking. How can I regulate to get the correct amount of oil? I may mention that with the tap turned fully on it runs back very fast by the return pipe into the top of the reservoir, and also uses up a considerable quantity of oil. (2.) If the machine is run for a time with the oil tap turned off, will all the oil from the crank case be pumped back into the reservoir by the return pipe, or does the action of pumping back cease when the oil tap is turned off. (3.) I have run now almost fifty miles, and was surprised to find that I had used one gallon of petrol. The machine runs with the air lever fully opened at all speeds and levels as far as I can judge. This led me to believe that possibly the carburetter was not taking in enough air. I have therefore just cleaned the air inlet gauzes, which I found rather dirty. Do you think that this will remedy the excessive fuel consumption? (4.) I found that the quantity of petrol in the tank reduced itself by a good quarter of an inch whilst standing idle recently. Is it likely that the needle valve needs grinding?—W.C.

(1.) You should find that one to one and a half turns of the oil regulator should be ample. Do not have so much oil turned on that the engine smokes continually. If the engine is receiving sufficient oil there should be a faint blue smoke issuing from the exhaust upon opening out after running light for a

time. (2.) No; the oil which is returned to the reservoir is the excess oil which has overflowed from the crank case into the sump. The oil will continue to be pumped back until the oil in the sump drops to a certain level. (3.) The excessive petrol consumption may be due to too large a jet. If the air intake gauze is stopped up this would also cause excessive consumption. With this carburetter, you should not be able to give absolutely full air at all speeds. When travelling all out on the level an improvement should be able to be effected if the air lever is very slightly closed down. If this is not so too large a jet is fitted. (4.) You should make sure there is no small leak anywhere in the tank, and that the petrol pipe is not cracked or leaking anywhere. The carburetter needle valve does not require grinding in unless petrol drips when the machine is standing. Always turn the petrol off when leaving the machine for the night. The fact that the petrol is reduced in the tank while standing suggests a leakage which should be located and stopped. We have personally completed a tour of 520 miles on four gallons of petrol No. 2 on a similar machine, crossing Dartmoor en route.

#### Engine will not Answer Throttle.

**Q.** I have a 6 h.p. twin with Senspray (jet 38), and when running the machine will not take full throttle. As a matter of fact, when opened beyond threequarters the engine slows down. I had previously a 44 jet, but experienced the same trouble, and concluded that the mixture was too rich, but cannot see that that is so as the air opening remains constant, and opening the throttle merely uncovers the full bore of the induction pipe. The engine runs hotter than some others I know, but does not overheat.—R.B.

Your trouble may be due to the carburetter being of too large a size for your engine, and so when the throttle is opened beyond a certain degree the suction is insufficient, so causing the power to decrease. If closing the air lever slightly improves matters, it is almost certain to be this or too small a jet. On the other hand, if closing the air makes matters worse the trouble is probably due to too large a jet causing an over-rich mixture at full throttle.

#### Suitable Gear for Sidecarrier.

**Q.** I intend using a machine with a three-speed hub gear for bread delivery. The driver, who has little or no experience of motors, I am inclined to think, would be likely to damage the gears for want of practical experience. Would you advise me to fit any other make of gear, such as a variable pulley? Under present circumstances, parts are difficult to obtain, and delay would mean considerable loss and inconvenience.—C.J.A.

You should have no trouble in changing these gears, hub gears being one of the easiest types to change. Of course, a variable pulley would be less likely to be damaged, but we do not think you would get anything like the results as with the gear. You should warn your man that when changing gear to a higher gear it is necessary either to declutch and throttle down or lift the exhaust valve while the change is being made.

#### Additional Cooling.

**Q.** In *The Motor Cycle* of October 21st, 1915, there is an article on "Internal Resistance," page 391. Under the heading "Cooling" it is stated that much better cooling results can be obtained by interposing coiled wire between the radiating fins or by the use of extra aluminium fins. I shall be much obliged if you will give me some details on the following: (1.) What exactly is meant by coiled wire? (2.) Of what metal is the wire made? (3.) What is the thickness of the wire? (4.) Is it simply tightened up round the cylinder between the fins, and touching the cylinder wall all round? This subject is very interesting to anyone owning a motor cycle and stationed in a tropical climate.—J.G.V.

(1.) The wire is coiled and inserted between the radiating fins, both round the cylinder and on the head. (2.) The wire should be for preference of copper, but brass or iron may be used with fair results. (3.) Of medium thickness, say about 1 mm. (4.) The coils should wedge themselves between the existing radiating flanges of the cylinder, but might be secured by wire if necessary. Springs can be obtained ready made for this purpose.

#### PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.



**Retaining the Old Registration Number.**

I am thinking of disposing of my present motor cycle and buying another second-hand, and am desirous of keeping my old numbers. Could this be done, and if so, how should I proceed? What should I do with the number of the new mount?—G.F.B.

If you like you can retain your old numbers. You will have to get permission to do this from the registration authorities, which should be asked at the time of cancelling the registration of the old machine. It will be necessary to pay full fees. The old numbers on the new mount should be cancelled at the same time.

**Long v. Short Stroke.**

(1.) I am thinking of purchasing a motor cycle with a long stroke engine, but have been repeatedly told that such engines very quickly develop wear in the bearings, etc. Is this so? (2.) Comparing a  $3\frac{1}{2}$  h.p. square engine with one of the long stroke type, from which should I expect longer service without requiring rebushing or re-boring?—W.G.C.

In properly constructed engines it is unlikely that there would be any difference between the wearing capabilities of the two types, though in all probability the short stroke would be more likely to wear out first, owing to the fact that these engines are intended to develop their power chiefly by the speed at which they run, and would consequently have more work to do. Again, in the long stroke the greater angularity of the connecting rod, if such existed, might cause greater piston wear than would occur in a short stroke engine.

**Carburettor Adjustments.**

I have a  $2\frac{1}{2}$  h.p. two-stroke fitted with a Senspray carburettor. If I close the jet to two-stroke on, say,  $30^\circ$  of throttle opening, it will not take more than  $120^\circ$  at the most with air lever fully open. If I bring the air lever back, it loses power. If I broach out the jet to take full air and full throttle, it eight-strokes up to  $30^\circ$ , then four-strokes to about  $90^\circ$ , with consequent loss of power, but beyond that roars up any hill, and does not overheat. Petrol consumption is in the region of 50-60 m.p.g. I should be glad to know how to get the maximum of power and minimum of consumption.—JET.

It is practically impossible to tell you any fixed method of getting the best adjustments with your carburettor, as this can only be done by experiment. It is possible that when using the smaller jet your petrol level is too low. The carburettor you have fitted is one which is inclined to be very sensitive to various throttle openings, yet if correctly adjusted you should have no difficulty with either fast or slow running. You should make sure that the jet screws in so that the jet orifice is exactly in the centre of the little funnel-shaped tube. If this is not central you might get the erratic running you speak of. The petrol level

should rise to within about  $\frac{1}{8}$  in. to  $\frac{1}{4}$  in. from the jet opening on this make of carburettor—that is, rather lower than is usually allowed on other makes. Make sure there are no air leaks either in the induction pipe or crank case.

**A Loose Nut in the Crank Chamber.**

In taking down my  $3\frac{1}{2}$  h.p. single-cylinder for cleaning, I unfortunately dropped one of the locking nuts into the base chamber. Will it be quite safe to run the machine with it in, or will it be necessary to have the whole dismantled?—A.E.D.

Probably if you took the cylinder off and washed out the crank case, then poked round with a stiff wire, or with a magnet attached to a rod, you would be able to fish out the nut, and this would save any further dismantling. It would most certainly not be safe to run the engine with anything loose in the crank chamber, as one never knows what may happen. As there is not much room, it is just possible that the nut may be lying between the two flywheels.

**EXPERIENCES WANTED.**

Readers desirous of obtaining the experience of others with various motor cycles or accessories must enclose a stamped addressed envelope in which the replies may be forwarded. Answers to the queries should be addressed c/o The Editor.

“J.K.W.R.” (Warwick).— $2\frac{3}{4}$  h.p. two-stroke British Excelsior, solo and with sidecar.

“A.C.” (Bude).—7 h.p. model G Powerplus Indian. Petrol consumption, controllability in traffic, and general reliability.

“Q.M.S.” (Norwich).—De Luxe T.D.C. single-gear two-stroke. Reliability, speed, consumption, controllability in traffic, and power for light sidecar.

“W.G.S.” (Dunedin, New Zealand).—3 h.p. Royal Enfield, with and without sidecar. General reliability, and in particular petrol and oil consumption and wear on tyres.

**RECOMMENDED ROUTES.****SWANAGE TO COVENTRY.—C.J.V.**

Swanage, Wareham, Lytchett Minster, Ringwood, Romsey, Winchester, Whitchurch, Newbury, East Ilsley, Abingdon, Oxford, Banbury, Coventry.

**LONDON TO PONTYPOOL.—E.W.**

Leave London by way of Shepherd's Bush and Ealing, Uxbridge, Beaconsfield, High Wycombe, Stokenchurch, Tetsford, Oxford, Eynsham, Witney, Northleach, Andoversford, Cheltenham, Longlevens, Gloucester, Minsterworth, Westbury, Newnham, Blakeney, Lydney, Chepstow, Usk, Pontypool. Approximately 150 miles.

**LOUGHBOROUGH TO MARGATE.—H.C.T.**

Loughborough, Leicester, Market Harborough, Kettering, Higham Ferrers, Bedford, Hitchin, Stevenage, Hertford, Ware, Harlow, Chipping Ongar, Brentwood, Ingrave, Tilbury, ferry to Gravesend, Chatham, Sittingbourne, Canterbury, Margate. 180 miles, approximately.

**NEATH TO FARNBOROUGH.—T.M.**

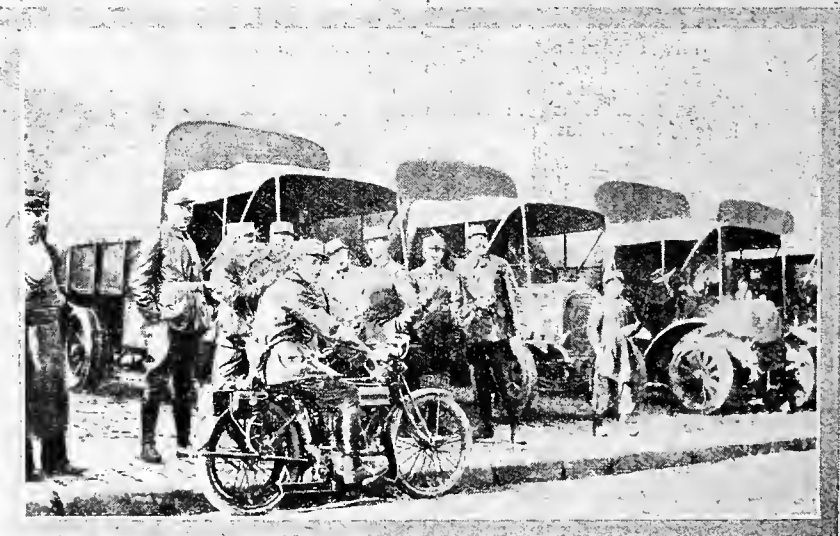
Neath, Bridgend, Cowbridge, Cardiff, Newport, Severn Tunnel Junction, train through Severn Tunnel to Pilning, Almondsbury, Iron Acton, Yate, Chipping Sodbury, Chippenham, Calne, Marlborough, Hungerford, Newbury, Kingsclere, Basingstoke, Hartford Bridge, Fleet, Farnborough.

**TAVISTOCK TO SALISBURY.—F.C.C.**

Tavistock, Two Bridges, Moretonhampstead, Exeter, Honiton, Chard, Crewkerne, Yeovil, Sherborne, Shaftesbury, Wilton, Salisbury.

**GRANTHAM TO AMESBURY.—Miss N.**

Grantham, Melton Mowbray, Leicester, Lutterworth, Rugby, Southam, Banbury, Chipping Norton, Burford, Lechlade, Highworth, Swindon, Marlborough, Pewsey, Amesbury.



Portion of a French motor lorry convoy at rest in a village behind the firing line. A Triumph mounted despatch rider is in the foreground.

**RESULT of the**  
**Public Schools Championship**  
**Hill Climb, Snowhill, April 12th.**

**—The**  
**CALTHORPE**

**J.A.P. LIGHTWEIGHT**

**was FIRST in ALL LIGHTWEIGHT**  
**CLASSES—and made FOURTH**  
**FASTEST TIME of the Day against ALL**  
**Powers of Motor Cycles and Combinations.**

This victorious  $2\frac{3}{4}$  h.p. CALTHORPE-J.A.P. embodies a high-powered Speed Unit of remarkable efficiency, and embraces all that is Highest and Best in Motor Cycle construction.

For Speed-work or general service it has no rival, and you will find it fully described on pages 6 and 7 of our latest Art Catalogue. Drop us a line for copy TO-NIGHT.

**CALTHORPE "ON TOP" AS USUAL !**

Now call on the nearest CALTHORPE Agent and inspect  
. . . . . this magnificent mount for yourself. . . . .

**CALTHORPE MOTOR CYCLE Co. (Minstrel & Rea  
Cycle Co., Ltd.), Barn St., Birmingham.**

# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal to perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

- A.J.S.**  
A.J.S. 1916, 6h.p., actually in stock.—Crow Bros., 190, High St., Guildford. [3517]  
A.J.S.: delivery from stock of all models.—Julians, Broad St., Reading. 'Phone: 1024. [X6762]  
**1916** 6h.p. A.J.S. Combination in stock.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X7825]  
**1916** A.J.S. 4h.p. Combination in stock.—Williams, A.J.S. Expert, Chapel Ash Depot, Wolverhampton. [X7805]  
A.J.S. 1913, 6h.p., coachbuilt sidecar, all accessories; or exchange Douglas; £40.—Reeves, Garage, Purley. 'Phone: 384. [4167]  
**1912** A.J.S. 2½h.p., 2-speed, Cowey, speedometer, all accessories; £19/10 cash.—R. Douthwaite, 15, Clarence St., York. [4036]  
A.J.S. 4h.p. twin, 1915, and coach sidecar, shop-soiled; reduced £75 to clear, bargain.—Campion Garage, London Rd., Derby. [3811]  
A.J.S. 4h.p., and sidecar, 1915 model, just delivered, £93/17; also 1916 2½h.p. model, £58.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]  
A.J.S. 1912, 6h.p., and Canoelet sidecar, splendid order, tyres nearly new, speedometer, horn, lamps, tools, Walbro screen; first £42 secures.—Box 318, c/o The Motor Cycle. [X7761]

## Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone: 766.

Telegrams: "Perfection."

### NEW 1916 MODELS.

LEVIS, 2½ h.p., 2-stroke	£32 0
SUNBEAM, 3½ h.p., 3-speed	£73 10
EXCELSIOR (American), 7 h.p., 3 speeds	£76 0
CALTHORPE Minor, 10 h.p., 2-seater	£185 gns.
NEW IMPERIAL, 2½ h.p., variable magneto	£38 0
OVERLAND, 12 h.p., 4-seater, electric starting and lighting; new tax, 8 guineas	£265 0
DOUGLAS MODELS.	Orders booked now.

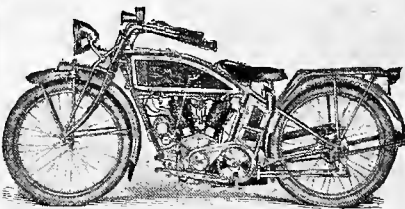
### (U.S.A.) EXCELSIOR.

1916, 7 h.p., twin, 84 × 89, mechanical and hand lubrication, kick starter, high-tension magneto, spring, forks, 2-gallon petrol capacity, 3-speed countershaft gear, multiple disc clutch with hand and foot control, handle-bar control, spring seat-pillar, 3in. non-skid tyre, finish Excelsior grey; latest 1916 model, £75.

Exchanges quoted. Easy payments arranged.

We are sole Yorkshire distributors. Liberal terms to trade.

Coachbuilt PERFECTION SIDECARS to suit, £13 10



### NEW 1915 MODELS

*CONNAUGHT, 2½ h.p., 2-speed	£41 16
*WOLF-J.A.P., 2½ h.p., 2-speed	£38 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed	£39 10
*ROYAL RUBY, 6 h.p., 3-speed	£87 0
U.S.A. EXCELSIOR, 7 h.p., dynamo lighting	£71 10

\* Cash offers wanted.

### SOLO MACHINES.

1915 4½ h.p. 2-sp. LINCOLN-ELK, as new	£38 10
1915 2½ h.p. 2-stroke 2-speed IVY	£26 10
1914 O.K., 2-speed Lightweight	£26 10
1914 3½ h.p. 2-speed ARNO	£29 10
1913 3½ h.p. 3 speeds, free engine	£27 10
1913 3½ h.p. ROVER, Cradock gear	£27 10
1912 3½ h.p. ZENITH-GRADUA	£26 10
1912 3½ h.p. 2-sp. BRADBURY, chain drive	£29 10
EXCELSIOR, 2½ h.p., 3-speed, Druid forks	£19 19
TRIUMPH, 3½ h.p., 1912 T.T. model (touring bars), very smart and speedy	£26 10
KERRY, 3 h.p., magneto, Saxon forks	£9 15
N.S.U., 4 h.p. Twin, 2-speed, spring forks	£15 10
REX, 3½ h.p., magneto, spring forks	£14 10
DOUGLAS, 2½ h.p., twin, spring forks	£15 10
TRIUMPH, magneto spring forks, new tyres	£18 10

### SIDECAR COMBINATIONS.

Brand New 1914-15 6 h.p. REX Sidette	£69 10
1914 6 h.p. REX Sidette, almost as new	£49 10
W.G. WILLIAMSON and Sidecar (new)	£89 15
QUADRANT, 7-9 h.p. 2-speed, twin, chain drive, and coach Sidecar. Fine lot	£49 10
1910 6 h.p. REX, 2-speed, and Sidecar	£24 10
1912 3½ h.p. 2-speed PREMIER and Sidecar	£33 10
1910 3½ h.p. 2-speed REX and Sidecar	£24 10

### MISCELLANEOUS.

1914 2-seater FORD, hood, screen, etc.	£79 0
ROYER, 3 h.p., 4-seater, all on	£49 10
WILLIAMSON 3-speed Cy-cl-a (new)	£126 0
MORGAN, 1914, de luxe, hood, screen, etc.	£79 10
PREMIER 7-9 h.p. 2-seater Car	£67 10
RITZ, 10 h.p., 2-seater (new)	£145 0
SINGER, 1914, dynamo lighting	£180 0
1915 GLORIA Coach Sidecar, almost as new	£12 10
SUNBEAM, 1916, new Sidecar	£17 17
WILLIAMSON Sidecar, as new	£12 10

## IMPORTANT NOTICE.

Owing to the Easter Holidays, the issue of "The Motor Cycle" for April 27th must be closed for press earlier than usual. All copy and instructions for Miscellaneous Advertisements in that issue must therefore be in our hands not later than first post on Thursday, April 20th.

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

- A.J.S.**  
A.J.S. 1912 6h.p. Twin Combination, 2-sp. countershaft gear, clutch, and kick start £48.—Tuke and Bell, Ltd., Motor Dept., Car Engineering Works, High Rd., Tottenham, N. [4]  
**Alldays.**  
ALLDAYS Allen, all models; immediate delivery easy terms 2% extra.—Befere Cycle Co., 332, E. Holborn. [0]  
**1915½** Allen, 2-strokes, 2-speed, almost new, perfect lamps, horn; sacrifice £28.—West, 2, Meowl Rise, Newhaven. [4]  
**ALLON, 1916, 2-stroke, 2-speed, clutch model, 1 once only, mechanical horn; £38, bargain.**—J and Co., 15-16, Bishopsgate Av., Camomile St., London. [0]  
**ALLON 2-stroke, 2-speed, clutch model, supplied in December, 1915, very little used; 34 gns., great bargain.**—Julians, Broad St., Reading. Big motor cycle and light car dealers in the South. 'Phone: 1024. [X7]  
**ALLDAYS** Allen 2-stroke Motor Cycles from £34 to £52/10; early delivery; deferred terms from 1/4 quarter down, balance by 12 monthly instalments. CH. purchasing motor cycles from us can practise on the vate road and test hill alongside these premises be venturing out into the West End traffic, this be the only London garage in the West End possess this facility, and also being the only London garage that is totally bomb-proof. We garage Alldays A motor cycles for 1/- per week, and in the event your being called to the colours, we will store as pending your return, for the nominal sum of 1/- month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4]  
**Arno.**  
**ARNO** Motor Cycles from £38 to £50; early delivery; deferred terms from one-quarter down, balance by twelve monthly instalments. Clients purchasing motor cycles from us can practise on the vate road and test hill alongside these premises be venturing out into the West End traffic, this be the only London garage in the West End possess this facility, and also being the only London garage that is totally bomb-proof. We garage Arno motor cycles for 1/- per week, and in the event of your being called to the colours, we will store some, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4]

# WE HAVE THE LARGEST SELECTION OF ALL THE BEST MAKES

MOTOR CYCLES LIGHT CARS



## New Machines in Stock.

NEW IMPERIAL-J.A.P., 2½ h.p., 2-sp.	£36 15
ALLDAYS ALLON, 2-speed, 2-stroke	£42 0
DOUGLAS, War Office Model	£54 12
DOUGLAS, Model V, 2-speed	£50 8
Popular LEVIS	£32 0
ENFIELD combination	£89 5
SPARKBROOK, 2-stroke	£40 0
A few shop-soiled NEW IMPERIAL lightweights	at £34 0

## Second-hand Bargains.

1914 RUDGE, 5-6 h.p., 3-speed	£45
1914 A.J.S., 5-6 h.p., 3-speed combination	£70
1915 DOUGLAS, T.T., 2½ h.p., 2-speed	£43
1914 3-speed 3½ h.p. NEW HUDSON and coach sidecar	£48
1915 2-stroke 2-speed VELOCETTE	£28
1913 2½ h.p. Ladies' DOUGLAS	£38
1914 INDIAN Combination, 7-9 h.p., 2-sp.	£53
1914 DOUGLAS, T.T., 2½ h.p., 2-speed	£38
1914 RUDGE, 5-6 h.p., shop-soiled	£35
1914 RUDGE, 3½ h.p., Philipson pulley	£25
1914 MOTOSACOGHE, 2½ h.p.	£15
1915 JAMES, 4½ h.p., James Canoelet Sc.	£55
1915 3-speed HARLEY and Swan Sidecar	£60
1914 2-speed IXION	£22
1914 CONNAUGHT, 3-speed	£30
1914 3-speed CLYNO, and coach Sidecar	£60
1915 7 h.p. MATCHLESS and coach sidecar	£78
1913 3½ h.p. ALLDAYS, 2-speed	£22
1911 2-speed HUMBER	£15

## Second-hand Cars

1915 WHITING-GRANT	£140
1914 SINGER, dynamo lighting	£175
1914 MORRIS-OXFORD	£160
1914 STAN DARD	£175
1913 MORRIS-OXFORD	£130
1913 FORD, 4-seater	£70
1915 HILLMAN Delivery Van	£172

## New Cars.

1915 FORD, 4-seater	£135
1915 LUCAR	£200
1915 BABY-GRANT, self-starter and dynamo	£160
1915 SINGER, dynamo	—

WE STILL HIRE OUT MOTOR CYCLES AND LIGHT CARS.

# REY'S

CAR DEPOT:  
378, 380, 382, 384,  
EUSTON ROAD,  
Phone: 4219 Regent.  
MOTOR CYCLE DEPOT:  
173, Great Portland St.  
Phone: 1970 Regent.

THE TRADE SUPPLIED.

## MOTOR CYCLES FOR SALE.

### Harley-Davidson.

HARLEY-DAVIDSON, 1915 model, 4h.p., 2-speed, single-cyl., with foot starter, horn, lamp, all complete, purchased last September, good as new; owner enlisted; £42/10.—Davies, 125, Tillingworth, Halifax, Yorkshire. [4095]

### Henderson.

HENDERSON, 1915, 10h.p., 4-cyl., 2-speed, and sidecar, as new; £70.—May, High St., Fareham, Hants. [X7452]

HENDERSON Combination, October, few miles, perfect; bought car—Builder, 233, Clapham Rd., S.W. Brixton 826. [4012]

HENDERSON 4-cyl. Motor Cycle, £85 nett; early delivery; deferred terms from one-quarter down, balance by twelve monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Henderson motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4058]

### Hobart.

HOBART Twin, in good order; £20, or exchange 2-stroke.—Letters, Conway, College Rd., Epsom. [X7767]

2½ h.p. 1915 Hobart, 2-stroke, 2-speed, brand new; £22 reduced to £31.—Alexander's, 115, Lothian Rd., Edinburgh. [3628]

HOBART, 1916 models in stock; 2½ h.p. 2-speed 2-stroke, 36 gns.; your present machine can be taken as part payment.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0597]

### Humber.

HUMBER, 3½ h.p., 2-speed, and almost new coachbuilt sidecar, splendid order; £28.—Alexander's, 115, Lothian Rd., Edinburgh. [3615]

1911 Humber, 3½ h.p., 2-speed, excellent condition, recently overhauled; £25.—Herbert, Holmwood, Canterbury Rd., Leyton, London. [4122]

1914 3½ h.p. 3-speed Humber, with coachbuilt sidecar, lamp, and horn, in excellent condition; price £45.—Leonard Pitcher, Thornbury, Glos. [X7468]

HUMBER, 6h.p., opposed cylinders, water-cooled, and best coach sidecar, practically new; cost £110, accept £85; exchanges considered.—Campion Garage, London Rd., Derby. [3812]

HUMBER, 1912½, 3½ h.p., 2-speed, F.E. Canoelet coachbuilt sidecar, lamps, horn, spare new Dunlop belt, tyre, and tube, case jets, foot pump, in splendid condition; £27, bargain.—68, Owston Rd., Carcroft, Doncaster. [X7800]

### Indian.

INDIAN, delivery from stock of all models.—Julians, Broad St., Reading. Phone: 1024. [X6764]

INDIAN, 1914, 7h.p., T.T., speedometer, lamp, and horn; £38.—Alexander's, 115, Lothian Rd., Edinburgh. [3623]

INDIAN, 5h.p., 3-speed, 1916 model, only run 60 miles; £59/10.—Alexander's, 115, Lothian Rd., Edinburgh. [3622]

INDIAN, 1915, 3½ h.p., 3-speed, clutch, kick starter, as new, 900 miles; £45.—Carey, 40, New Kent Rd., London. [X7653]

1915 Indian Combination, 7h.p., 1,300 miles, extras; £70.—Greoun, St. Ann's Vicarage, Nottingham. [X7795]

1914½ Indian, T.T., 7-9h.p., clutch, splendid condition, fully equipped; £38.—L. Robertson, Stoke Golding, Nunenton. [X6596]

1914 Hindee Special Indian, complete as new, nearest £43; 20 gn. Indian sidecar, £11.—Box 322, c/o The Motor Cycle. [X7838]

INDIAN, 1914, 7h.p., 2-speed, spring frame, electric equipment, perfect order; £48/10.—Alexander's, 115, Lothian Rd., Edinburgh. [3624]

INDIAN, 1915, 5h.p., semi-touring bars, as new, very little used; £50, or offers.—H. Leftwich, Stant-holme Grove Park, Chiswick, W. [4075]

INDIAN, 5h.p., T.T., clutch model, 1912-13, new tyres, powerful machine, fully equipped; £25.—Speechley, 45, Church Rd., Acton. [X7834]

INDIAN, 1915½, 5h.p., 3 speeds, semi T.T. bars, foot and hand clutch, little used, practically unscratched; £59.—Kennedy, Hascombe, Godalming. [X7465]

INDIAN, 1913, 7h.p., 2-speed, with coachbuilt sidecar, all newly overhauled, and in splendid running order; £42/10.—Alexander's, 115, Lothian Rd., Edinburgh. [3625]

INDIANS.—Model B £70, model F Powerplus £90, and G Powerplus £75; also sidecars to suit; exchanges, deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4141]

INDIAN, 7-9h.p., 1914, and sidecar, 2-speed, electric set, electric horn, speedometer, and kick start, just overhauled, in splendid condition; great bargain, £48.—Lorimer, 1, Burlington Mansions, South Grove, Highgate. [4179]

## The value WE give pays all YOUR taxes and plenty to spare.

### The following New Models are all in Stock—

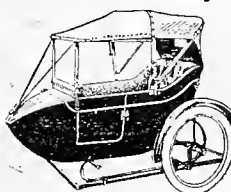
1916 6 h.p. A.J.S. Combination, interchangeable wheels	98 gns.
1916 4 h.p. A.J.S. Combination, interchangeable wheels	90 gns.
1916 6 h.p. ENFIELD Combination	85 gns.
1916 8 h.p. ENFIELD Combination	87 gns.
1916 6 h.p. J.H. Combination	90 gns.
1916 6 h.p. NEW HUDSON	72 gns.
1916 6 h.p. NEW HUDSON Combination	86 gns.
1916 2½ h.p. NEW HUDSON, 2-sp., 2-stroke	£38 0
1916 2½ h.p. OMEGA-J.A.P., 2-speed	38 gns.
1916 2½ h.p. OMEGA, 2-stroke, 2-speed	38 gns.
1916 8 h.p. British EXCELSIOR Combination, Jardine 4-speed gear	£98 0
1916 5-6 h.p. British EXCELSIOR, Sturmeys countershaft 3-speed gear	68 gns.
1916 4½ h.p. British EXCELSIOR, Sturmeys countershaft 3-speed gear	64 gns.
1916 FORD Touring Car, 20 h.p.	£135 0
1916 FORD Chassis, 20 h.p.	£115 0
1916 FORD Van, 20 h.p.	£130 0
1916 20 h.p. FORD Ambulance	£135 0
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on	£120 0

## SECOND-HAND BARGAINS.

1914 6 h.p. ENFIELD Combination, speedometer, lamps, etc., very smart	£62 0
3½ h.p. NEW HUDSON, 3-speed, combined drive	£33 0
3½ h.p. ROVER, 1913, 3-speed	£29 0
1914 8 h.p. Red ZENITH Comb., very fast	£59 0
1915 WOLF, lightweight, 3-speed	£25 0
2-speed RADCO, 2-stroke, fine condition	£25 0
2-stroke OMEGA, Druid forks	£19 0
1914 DOUGLAS, 2-speed, fine machine	£36 0
3½ h.p. R.S.U., spring frame, 2-speed	£17 0
3½ h.p. TRIUMPH, 1911, clutch model	£22 0
3½ h.p. 1908 TRIUMPH, fine goer	£17 0
3½ h.p. 1909 CEX de Luxe, 2-speed, handle starting	£19 0
1913 FORD, English body, Bosch magneto, disc wheels	£84 0

## FARLOW SIDECARS.

Build throughout in our own factory. Farlow Sidecars have that pleasing style, exquisite finish, and lasting qualities which are the buyer's ideal.



MODEL r.  
Underling Chassis,  
with Luggage Carrier  
combined.

Splendidly made and  
built for hard work.

£11 0 0

Hood ..... £2 4

Screen ..... £1 0

PRICE LIST POST FREE.



## NEW MOTOR CYCLE FRAMES.

Fully Guaranteed.

25/- each.

## ODD BARGAINS.

Few Single and Twin magnetos, new	22/8
New 650 x 65 Dunlop Rubber-studded Covers	8/10
8-10 h.p. Precision Engine, quite new. What offers?	56 0
6 h.p. Twin Antoinette Engine, water-cooled	£12 12
8 h.p. J.A.P. Twin Engine, air-cooled	35/-
F.R.S. Lamp Set, 500 beam, shop-soiled	45/-
F.R.S. Lamp Set, 1,000 beam, shop-soiled	45/-
New Clincer Clearance Covers, de Luxe, "heavy" rubber-studded, 26 x 2½, 26 x 2½, 26 x 2½, and 26 x 2½ x 2½	each £1 0
Latest Mechanical Horn, black and nickel	£1 0
Cowey Speedometer, for 26 x 2½ wheel	£2 0
Cowey Speedometer, for Morgan	£2 5
Set of Miller's Cycle Car Lamps and Generator (new)	£3 0
Lukia Cycle Car Carburetter, new condition	15/-
Cox Cycle Car Carburetter	10/-

## FARRAR'S MOTORS

(Telephone 919.)

Hopwood Lane, HALIFAX.



## MOTOR CYCLES FOR SALE.

## Invicta.

1916 2½ h.p. Invicta 2-stroke; £25.—Parker and Son, St. Ives, Hunts. [4158]

## Ixon.

IXION, latest model, for immediate delivery; good allowance for your present machine.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [3739]

## James.

1916 James 2-stroke in stock.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X7826]

JAMES No. 6 Combinations in stock; no waiting.—Colmore Depot, 261, Deansgate, Manchester. [3655]

1914 James Combination, with hood, screen, etc.; only £50.—Parker and Son, St. Ives, Hunts. [4157]

JAMES, 4 h.p., 1915, belt driven, clutch, unsprafed, perfect condition; sacrifice £35.—Beasley, 50, Booth St., Handsworth, Birmingham. [X7733]

JAMES 1916 Combinations actually in stock, £80/15; one with Lucas lighting set, £97/7.—T. Stevens, James Expert, Gooch St., Birmingham. [X7286]

JAMES, 4½ h.p., 3-speed countershaft and clutch, had little use, with lamps and all accessories, and cane sidecar; owner called up: £42.—Collyer, 286, High Rd., Wood Green, N. [X7647]

## J.A.P.

2½ h.p. c.h.v. T.T. Special J.A.P. Humber, Druids, Bosch, fast, perfect: £18.—Barnard, 70, Drayton Park, Highbury. [4177]

## J.E.S.

J.E.S., 1¼ h.p., 1914 Humber 3-speed, overhauled, excellent condition, good tyres; £12.—29, Tintagel Crescent, East Dulwich. [4076]

## J.H.

3½ h.p. Twin J.H., 3-speed gear box, kick start, clutch; immediate delivery; exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [3737]

2½ h.p. 2-speed 2-stroke J.H., for immediate delivery; exchange.—Send your particulars to W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [3738]

## Lea-Francis

1914 3½ h.p. Twin Lea-Francis Motor Cycle, free engine, kick starter, countershaft gear, F.R.S. lamp set, Lucas horn and accessories, in capital order: £45.—H. C. Davies, Prince of Wales Rd., Norwich. [X7473]

LEA-FRANCIS, New Oct., 1914, little used, owner ill, with coachbuilt sidecar to match, in new condition; any expert examination; bargain, 55 gns., complete.—Turner, High St., Upton-on-Severn, Worcester-shire. [4034]

## Levis.

LEVIS 1916 Popular Models in stock; £32.—D. J. Shepherd and Co., Enfield Highway. [4071]

LEVIS; delivery from stock of all models.—Julians, Broad St., Reading. Phone: 1024. [X6767]

LEVIS Popular, or new model E; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0764]

1915 Popular Levis, perfect condition, under 1,000; £19/10, or near offer. See Connaught.—Ricks, Kingfield, Woking. [4113]

LEVIS, used in fine weather only, a few months old, property of a lady; £25, or nearest.—Box 327, c/o The Motor Cycle. [X7814]

LEVIS, 1916; delivery of Popular models from stock. You can have one for Easter.—Layton's Garage, Bicester, Oxon. Phone: 35. [X7842]

LEVIS Popular Model, new, slightly shop-soiled, special bargain, £27.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4082]

1915 2½ h.p. Levis, Model de Luxe, countershaft, lamps, horn, new belt and chain, perfect order; £40.—Newson, Westleton, Saxmundham. [4043]

LEVIS 1916½ Popular, good condition, head and tail lamps, mechanical horn, knee-grips; £24, or near offer.—Cremona, Balmoral Rd., Gillingham, Kent. [4049]

LEVIS 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents. Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. Phone: 1432 Regent. [0711]

1915 Levis, 2-stroke, shop-soiled only, in absolutely perfect condition; 25 gns.—Julians, Broad St., Reading. Biggest motor cycle and light car dealers in the South. Phone: 1024. [X6770]

LEVISES.—1916 models actually in stock; also a few 1915's at old prices; also 3 Populars, second-hand, from £21; deferred payments by arrangement.—Lamb's, 151, High St., Waltham-stow, and 50, High Rd., Wood Green. [4142]

## Lincoln-Elk.

LINCOLN Elk 4 h.p., 1913-14 Coachbuilt Combination, countershaft gears, free engine, kick-start, beautiful turnout; £28.—Speckley, 45, Church Rd., Acton. [X7833]

## L.M.C.

1913 L.M.C., 3½ h.p., 2-speed, countershaft, kick starter, engine perfect, Amac, Bosch, pad, 2½ in. tyres and belt new, kumps, tools, spares, Beacon outfit, overhauled February (22); illness cause of selling; £26/10.—166, Bedford Rd., Kempston. [4054]

# We want SECOND-HAND MOTOR CYCLES

and are prepared to make exceptionally liberal allowances in part exchange for 1916 models of any make.

ALL THE WELL-KNOWN MAKES—LIGHT-WEIGHT, MEDIUM-WEIGHT, AND SIDECAR COMBINATIONS—IN STOCK, INCLUDING

## 1916 MODELS:

COVENTRY EAGLE, 2½ h.p., 2-stroke	36 gns.
Ditto 2-speed	42 gns.
CONNAUGHT Miniature, 2½ h.p., 2-stroke	£28 17 6
Ditto 2-speed	£36 6
SUN-VILLIERS, 2½ h.p., 2-stroke	£29 10
Ditto 2-speed	£36 0
SUN-V.T.S.	£30 10
Ditto 2-speed	£37 0
BROUGH, 3½ h.p., horizontal, twin, 2-speed	£59 6 6
Ditto 3-speed countershaft, with clutch and kick starter	£66 3
B.S.A., Model K	£62 0
B.S.A., Model H	£64 0
A.J.S., 4 h.p., twin, 3-speed, Combination	£93 17
ALLON, 2½ h.p., 2-stroke	£34 0
Ditto 2-speed	£42 0
Ditto with clutch	£45 0
INDIAN, Model F, Powerplus model, with speedometer, lighting set, and electrical horn	£90 0
INDIAN, Model G	£75 0
ZENITH, 4-5 h.p., Model D, with clutch and kick starter	£73 18
Ditto 6 h.p., Model F	£84 0
ENFIELD Combination, 6 h.p.	85 gns.
O.K. Junior, 2½ h.p. J.A.P. engine, 2-sp. gear	£38 0
Ditto 2-speed and clutch	£40 15
O.K. Junior, M.A.G. engine, 2-speed	£42 10
NEW IMPERIAL J.A.P., 2-speed	£38 0
Ditto with clutch and kick starter	£44 8
NORTON Big Four Combination	£84 0
QUADRANT 4½ h.p. 3-speed Combination	£72 10
JAMES, No. 7, 3½ h.p., 3-speed, twin	63 gns.
JAMES 4½ h.p. 3-speed Combination, complete with storm apron	£80 10
HAZLEWOOD 6 h.p. 3-speed Combination	£92 0
AMERICAN EXCELSIOR, 7 h.p., 3-speed, with 16 gns. Empire de Luxe Sidecar to match	£85 0
Etc., etc.	

NOTE.—The allowance on your present machine can be used as deposit, and the balance on the new machine can be arranged in 12 or less equal monthly instalments. Please send for particulars.

A good selection of Second-hand Motor Cycles in stock for sale for cash; or by Extended Payments, one-fifth of the cash price deposit and the balance in 12 equal monthly instalments. Full List and particulars post free.

Every machine is thoroughly overhauled and tested before being sent out.

*The Service Company Ltd.*  
LONDON

289-293, High Holborn,  
LONDON, W.C.

Telephone—Holborn, 6430.  
Telegrams—"Admittedly, London."

## MOTOR CYCLES FOR SALE.

## Martin.

MARTIN-J.A.P., 1913, 2½ h.p., overhead valves, Bosch, forced feed Amac, speedometer, T.T. bars, all accessories, perfect order; £26.—Vinceat Motor Co., Bees Lane, Rugeley. [X7315]

MARTIN-J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [0760]

## Matchless.

5-6 h.p. Matchless-Jap Combination, free, reliable, good tyres; £32.—Bunting, Printer, Norwich. [X7804]

MATCHLESS, 1912, 6 h.p., cane sidecar, lamps, and accessories, re-painted; £45.—Reeves, Garage, Purley. Phone: 384. [4166]

MATCHLESS J.A.P. 6 h.p. 1913½ Combination, splendid condition, numerous spares; £46/10.—307, Goldhawk Rd., W. [4026]

MATCHLESS, 6 h.p., 1913, and wicker sidecar, in good running condition; £40, or near offer.—Gelder, Longmarton, Carlisle. [X7737]

MATCHLESS 1913 8 h.p. Combination, 2-speed Jap drive, chain drive, in good condition, very fast, T.T. bars, accessories; £50, no offers.—H. Beattie, Whittington, Corbridge-on-Tyne. [4044]

8 h.p. Matchless, 1913 model, J.A.P. engine, twin belt drive, Grafton coachbuilt sidecar, new Dunlop extra heavy back and front, entirely overhauled, re-enamelled throughout, as new, lamp and horn; a real good bargain, take £50; must sell.—Satchell, The Lodge, Englemere, Ascot, Berks. [4106]

## Moto-Reve.

1912 Moto-Reve, twin-cyl., no reasonable offer refused.—Bastable, 16, Polygon Mews, Burwood Place, Edgware Rd., W. [4074]

## Motosacoche.

MOTOSACOCHE, in good condition; 8 gns., great bargain.—Julian's, Broad St., Reading. Biggest motor cycle and light car dealers in the South. Phone: 1024. [X5387]

## M.M.C.

£14.—3 h.p. M.M.C., T.T. mag., low frame, spring forks, perfect condition, reliable.—M. Callard, 120, King's Rd., Camden Town, N. [4038]

M.M.C., 3 h.p., recently overhauled, good tyres, Bosch, B. and B. for sale in fortnight; £16; owner called up.—Kempster, Shere, Surrey. [4041]

## New Hudson.

NEW Hudson 1916 6 h.p. Combination, just arrived; £92/8; exchange.—Below.

NEW Hudson, 1916 model C. 2-strokes, £38; four in stock.—D. J. Shepherd and Co., Enfield Highway. [4069]

2½ h.p. New Hudson, 4-stroke, good as new, late 1914, fully equipped; cash offer.—E. Gladwin, Felsted, Essex. [X7549]

1915 New Hudson 2-stroke, 2-speed, lamps, horn, etc., good condition; £30.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X7828]

NEW Hudson 2-stroke Lightweight, special Dunlops, Miller head set, panniers, etc.; £23, as new.—33, Cadogan Terrace, Victoria Park, London. [4153]

NEW Hudson Big Six Combination, belt-cum-chain, 3-speed, mileage under 1,000, perfect order, all accessories; 60 gns.—Walker, 18, Sunny Gardens, Hendon. [X7730]

1914½ New Hudson, 2-stroke, sound condition, new tyres, Lucas lamps, mechanical horn; £25, no offers; appointment Sundays.—Jacobs, 31, Gower St., W.C. [4023]

1914 6 h.p. New Hudson Combination, complete with 4-speed countershaft gear, speedometer, lamps, hood, wind screen, all tyres good; sell for £65, or will exchange with cash for late 4 h.p. A.J.S. combination, preferably new.—29, Devonshire Buildings, Bath. [4063]

## New Imperial.

NEW Imperial-Jap, 1916 models in stock; £38 and £44/8.—Crow Bros., Guildford. [3967]

NEW Imperial; delivery from stock of all models.—Julians, Broad St., Reading. Phone: 1024. [X6766]

NEW Imperial, light tourist, immediate delivery; cash or easy terms.—Referee Cycle Co., 332, High Holborn. [0765]

IMPERIAL-J.A.P. Light Tourist, new, slightly shop-soiled; special bargain, £33/10; 2-speed.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London, [4083]

1915½ New Imperial-Jap, 2½ h.p., 2-speed, variable ignition, almost new; what offers? any trial.—Seen, Simpson's Garage, 2, North Side, Wandsworth Common. [4098]

## Norton.

1914 3½ h.p. 3-speed Norton; £40.—Below.

3½ h.p. 3-speed Norton, purchased May, 1915, with 32 Burbury coachbuilt sidecar; £48.—Parker and Son, St. Ives, Hunts. [4160]

## MOTOR CYCLES FOR SALE.

## Norton.

**NORTON** Motor Cycles from £52/10 to £85; early delivery; deferred terms from one-quarter down, balance by twelve monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Norton motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4059]

## N.S.U.

**1908 N.S.U.** 3½ h.p. Combination, 2-speed and free, B. and B. h.b.c. mag., side entrance torpedo case sidecar, sacrifice £15/10, or nearest offer.—Wilson, 86, Queen's Rd., Bayswater W. [3288]

## O.K.

**O.K.** 2½ h.p., 1915, 2-speed, perfect; bargain, £25.—Simpson, Chemist, Istock. [X7759]

**O.K. Junior**, 2 h.p., 2-speed, brand new, 1915 model; going at £29.—Alexander's, 115, Lothian Rd., Edinburgh. [3627]

**1915 O.K.**, 2½ h.p., Mark V. model, 2-speed gear, countershaft drive and engine excellent, as new; £26/10.—Robinson's Garage, Green St., Cambridge. [4127]

**O.K. Junior**, 1915, 2 speeds, Miller lamp set, and horn, purchased February, 1916, ridden 50 miles only, as new; £26.—Service Co., 292, High Holborn, London, W.C. [4120]

## Omega.

**OMEGA** 2-stroke Motor Cycles, £31/10 to £31/16; early delivery; deferred terms from one-quarter down, balance by 12 monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Omega motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4056]

## P. and M.

**P. and M.**, late 1913, 3½ h.p., 2-speed, lamps, and speedometer, horn, tools, etc., and P. and M. coachbuilt sidecar, good condition; £50.—Apply, Clay Hill Nursery Co., Ltd., Theobalds Park Rd., Enfield. [4045]

## Peco.

**SPRING Frame Sporting Lightweight**, built by motor engineer, 349 cc., 2-stroke engine, re-bushed throughout, 1916 B. and B. 2-stroke carburettor, 26 x 2½ wheels, new tubes, fair covers, circular tank, dropped bars, Druid forks, electric head and tail lamps, minus magneto, sprockets, and aluminium cover; cost £27/10, sell best offer over £15, cash only.—Box 314, c/o The Motor Cycle. [X7649]

## Peugeot.

**5 h.p. Peugeot**, Bosch, B. and B., excellent condition; bargain, £18.—146, Station Rd., Crayford. [4010]

**PEUGEOT**, 6 h.p., wider sidecar, 2-speed, Claudel-Hobson, Bosch, Druids; £22.—Seen at Mid Surrey Garage, Addlestone. [4161]

**7 h.p. Peugeot**, 2-speed, in splendid condition, with Pillion seat, coach sidecar; price £28, or offer.—King, 111, Southampton St., Camberwell. [4053]

## Precision.

**PRECISION-TORPEDO**, 3½ h.p., 1914, free engine, B.S.A. clutch, variable gear, almost new condition; £26/10; exchange 2-speed lightweight.—Woolidge, 82, Wiverton Rd., Sydenham. [4185]

## Premier.

**PREMIER**, 1913, 3½ h.p., 2-speed countershaft gear, clutch, splendid sidecar or solo mount; £32.—Below. [4185]

**PREMIER**, 1914, 3½ h.p., 3-speed countershaft gear, clutch, and kick-starter, coach sidecar, splendid order; £48.—Below. [4185]

**PREMIER**, 1911, 3½ h.p., 2-speed N.S.U. gear, good condition; £20.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [4042]

**1913 Premier**, 2-speed gear box, coachbuilt sidecar, condition good; £30, bargain.—Wills, 57, Earl St., Northampton. [X7458]

**PREMIER**, 1915½, 3½ h.p., Millford 221 sidecar, mileage 750, medical reasons for sale; what offers?—Seen, 20, Holborn Viaduct, E.C. [X7749]

**PREMIER**, 3½ h.p., 1912, free engine, h.b.c. (Mabon), good tyres, excellent condition; £23.—Barden, Beehive Lane, Baddar Rd., Chelmsford, Essex. [4018]

**PREMIER**, 1913, 3½ h.p., clutch model, new tyres, belt, Jones speedometer, P. and H. lamp; £27, bargain.—Thorogood, 305, Brockley Rd., Brockley. [4048]

**1914½ 3½ h.p. Premier**, 3-speed countershaft gear, coachbuilt sidecar, excellent condition; £50, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea. [0721]

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1914 3½ h.p. SUNBEAM, 3-speed, and Sidecar	65 0	25 0	71/8
1914 4 h.p. ZENITH	42 0	12 0	53/9
1914 3½ h.p. SUNBEAM	46 10	—	—
1915 2½ h.p. ALLDAYS and Sidecar	30 0	—	—
1911 3½ h.p. KERRY-ABINGDON	20 0	—	—
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## Premier.

**PREMIER** Combination, 1914, 3½ h.p., chain-cum-belt, kick starter, excellent condition; £47.—A. J. Saunders, Station Approach, Beckenham, Kent. [4014]

**PREMIER**, 3½ h.p., 1912, engine re-bushed and thoroughly overhauled, lamps, belt, tyres good condition; £17.—South Essex Motors, Ltd., High Rd., Seven Kings, Ilford. [4119]

**PREMIER**, 1914, 3½ h.p., 2-speed countershaft, 1915 coach sidecar, handle starter, lamps, and horn, all new tyres, belt, cylinder, piston, engine sprocket, and chain; £45.—Box 278, c/o The Motor Cycle. [X6868]

**PREMIER**, 3½ h.p., 3-speed, clutch, new March, 1914, coach sidecar, splendid condition throughout, 40 gns.; new 24x2 Moseley cover, 14/6; new self-contained rear light, 8/6.—Marsden, Stonewell, Lancaster. [4111]

## Quadrant.

**QUADRANT**, 1916, 4½ h.p., B.S.A. countershaft chain-cum-belt, solo; £60; from stock.

**QUADRANT**, 1916, chain-cum-belt combination; £72/10; from stock.

**QUADRANT**—The above models can be supplied on exchange or deferred payment terms.

**QUADRANT**—Write to us for details of second-hand machines for disposal.

**QUADRANT**—For information of any nature respecting Quadrant motor cycles, apply to Quadrant Motors, 78, Gt. Queen St., Kingsway, W.C. Tel.: Holborn 5283. [4186]

**1911-12 Quadrant**, 3½ h.p. machine, splendid condition, spring forks, pedal starting gear, can do 50, carburettor just overhauled and ignition replaced, handsome machine, Michelin tyres, new belt, etc., fully equipped, lamps, spares, tools, ready for the road when one or two minor adjustments are made; a really honest and sound bargain, price £10/10.—F. Barthorp, 12, Elm Park Rd., Chelsea, London, S.W. [X7818]

## Radco.

**NEW Radco**, 2½ h.p., 2-stroke, Palmer tyres; £25.—188, High Rd., Ilford. [X0731]

**RADCO**, 2-stroke, 2-speed, brand new, 1915 model; £29.—Alexander's, 115, Lothian Rd., Edinburgh. [3626]

**RADCO**, nice condition, in tip-top order, complete, with acetylene head and tail lamps, aluminium footboards, new Dunlop tyre and belt, low consumption, splendid climber; 20 gns., lowest.—349, Lillie Rd., Fulham. [4051]

## Rex.

**REX**, 1912, 8 h.p. J.A.P. engine, coachbuilt sidecar; bargain, £35.—Reeves, Garage, Furley. Phone: 384. [4165]

**REX**, 1912, 6 h.p., with sidecar, almost new tyres; £35, or best offer.—Annett, Terrace Rd., Walton-on-Thames. [4115]

**REX** Motor Cycle, mag., Druids, new tyres, good condition; first £8 secures.—21, Clarence Rd., Hinkley. [X7801]

**£15-3½ h.p. Rex**, Bosch, B. and B., stand and carrier, fast, also 2-speed free engine back wheel; £25.—Foreman, 25a, McLeod Rd., Plumstead. [4050]

**REX**, 1913, 6 h.p., 2-speed, free engine, coach combination, fitted hood and screen, just overhauled, perfect condition, powerful and reliable; £45 cash; take solo or lightweight part.—A. Holland, Earlsdon, Coventry. [X7847]

## Rex-Jap.

**REX-J.A.P.**, 6 h.p., 1915, coachbuilt sidecar, 3-speed countershaft; cost £98, take £55.—307, Goldhawk Rd., W. [4027]

## Rover.

**1914 Rover**, 3½ h.p., T.T., Philipson pulley, very fast and sporty machine; £29/10.—Alexander's, 115, Lothian Rd., Edinburgh. [3621]

**ROVER**, perfect condition, fast; a bargain, £22, or offer.—Cannon's Garage, near Piggs Marsh, London Rd., Mitcham, Surrey. [4150]

**1915 Rover**, 3½ h.p., F.E. N.S.U. gear, lamp, horn, speedometer, good condition; £29/10.—Robinson's Garage, Green St., Cambridge. [4131]

**FOR Sale**, Rover 3½ h.p. coachbuilt combination, perfect, reliable, 2 new Dunlop tyres, or exchange 4-h.p. Zenith.—Goding Bros., Fore St., Ipswich. [4011]

**ROVER**, 1916 T.T. models in stock, fitted with handle-bar controlled Philipson pulley; £56; exchanges or extended terms quoted.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0598]

**ROVER**, late 1915, T.T., Philipson pulley, Dunlops (650x65), Lucas lamp, horn, rear lamp, condition as new, very fast machine, guaranteed perfect; approval against cash.—Walter Matthews, 117, Suffolk St., Birmingham. [X7851]

## Royal Ruby.

**ROYAL Ruby** 2-stroke, June, 1915; £20, lowest.—Red Garage, Malton. [X7799]

**1915 Royal Ruby**, 2½ h.p., 2-speed, speedometer, P. and H. lamps, Handophone, Palmer codr tyres; £27, or offers.—Oliver, D74, Machine Gun Centre, Harrowby Camp, Grantham. [X7765]

## Rudge.

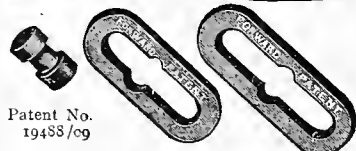
**1912 3½ h.p. Rudge**, free engine, good condition; £25.—R. E. Jones (Garages), Ltd., Swansea. [0785]

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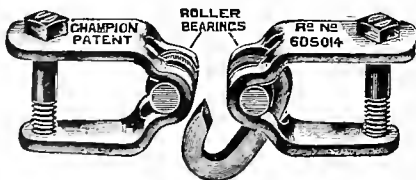
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## MOTOR CYCLES FOR SALE.

### Rudge.

1915 Rudge Multi and coachbuilt sidecar, 3 1/2 h.p., as new; price £48.—Percy Platt, Mumps, Oldham. [4103]

RUDGE Multi, 1913, free engine, sidecar, perfect condition; £36.—56, Earl Marshall Rd., Pitsmoor, Sheffield. [X7650]

RUDGE Multi, 3 1/2 h.p., 1913, recently overhauled, in excellent running condition; £51, or near offer.—Gelder, Longmarton, Carlisle. [X7738]

RUDGE Multi, T.T., 3 1/2 h.p., complete, speedometer, lamps, horn, all in perfect condition; £45, or near offer.—Shapley, 1, Park Mount, Torquay. [4042]

1912 1/2 Rudge, free engine, good tyres, belt, all accessories, splendid order, very little used; £28.—Apply, E. Chrimes, Neston, Cheshire. [4097]

RUDGE Multi 1916 3 1/2 h.p. Roadsters, £58/15; three in stock, and Canoelet sidecars to suit; exchanges.—D. J. Shepherd and Co., Enfield Highway. [4072]

LATE 1915 Isle of Man T.T. Rudge Multi, under 1,300 miles, perfect condition throughout, usual accessories, spares, unscratched, unpunctured; £48.—Box 329, c/o The Motor Cycle. [X7873]

RUDGE Multi, late 1914, 5-6b.p., Paragon sidecar, all accessories, 3 lamps, trip speed meter, tyres new, guarantee perfect running; trial run given; price £55.—2, Salisbury Rd., Seven Kings, Essex. [4061]

### Scott.

SCOTT, 3 1/2 h.p., 1912, and sidecar, 2-speed, kick starter, Binks; £52/10.—Webb, Hillside, Burnham, Bucks. [4180]

SCOTT, T.T., 2-speed, kick start, fast machine; owner enlisted; £19.—must sell.—Bell, 36, Southwark Park Rd., S.E. [4033]

1915 Scott, in Ireland, new last July, only ridden 100 miles, carefully stored since; what offers?—A. Sikes, Lieut. A.O.D., Red Barracks, Woolwich, S.E. [X7747]

SCOTT, 3 1/2 h.p., 2-speed, and Millford cane sidecar, splendid running order, tyres almost new; must sell, £24, first cheque secures.—Main, 47, Wellgate, Dundee. [X7803]

SCOTT Combination, 1912-13, scarcely used since August, 1914, sweet machine, in perfect condition throughout, tool kit and spares, lamp, speedometer, etc.; nearest to £40 secures, bargain.—Tilley's Garage, Dorchester. [X7655]

### Singer.

SINGER, 1913, 3 1/2 h.p., 3-speed, clutch; bargain, £19.—95, Morant Rd., Colchester. [4174]

7-9h.p. Singer Chassis, guaranteed mechanically perfect, sound tyres, no engine; £25.—Irving, 47, Mesnes St., Wigan. [X7742]

SINGER, 4h.p., 2-speed countershaft, coachbuilt combination, speedometer, head lamp, horn, mileage only 2,600; £45.—Steele, Glenfeshie, Camberley. [X7735]

### Sun.

SUN, 2-strokes; all models from stock from £29/10.—Culmore Depot, 261, Deansgate, Manchester. [3654]

SUN-VILLIERS, unused, £23/10; 2-speed, £28/10; one second-hand, £19.—Oracle Motors, 336, Gray's Inn Rd., W.C. [4030]

SUN-V.T.S., 1916, 2 1/2 h.p., 2-stroke, 2-speed, practically new; bargain, £28.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

SUN-VILLIERS, 1916, 2 1/2 h.p., run 100 miles, like new, lamp; £23; will exchange Douglas, cash adjustment.—King, Chemist, Sutton, Surrey. [4147]

1915 Sun-Villiers, splendid condition; 20 gns. very great bargain.—Julians, Broad St., Reading. Biggest motor cycle and light car dealers in the South. Phone: 1024. [X5386]

### Sunbeam.

1916 Sunbeam, 3 1/2 h.p., £5/5 speedometer, large Lucas lamp and generator, tail lamp, mechanical horn, done 600 miles, as new; £68.—Dickinson, High Town, Luton. [X7819]

LATE 1914 3 1/2 h.p. Sunbeam, with Canoelet sidecar, complete with speedometer, Lucas lamps, and horn; £65.—E. C. Wheeler, Nestle, King's Rd., Newbury, Berks. [X7459]

### T.D.C.

1914 T.D.C. De Luxe special model, 2 1/2 h.p., 2-stroke, not run 100 miles, variable gear, guaranteed perfect, take two anywhere, all on; £24; ride away; free lessons if novice.—4, Gaywood Rd., Walthamstow. [4176]

### Thorn.

8h.p. Thorn Motor Cycle, 1915, 2-speed, electric light, electric horn, speedometer, coachbuilt sidecar, has only done 500 miles; £75.—Portman Garage, 174, Upper Richmond Rd., East Sheen, London, S.W. [4066]

### T.M.C.

T.M.C. 4-cyl. late 1913 Combination, hood and glass screen, 3-speed gear box, water-cooled, force feed lubrication, just overhauled, fitted with 3 electric lamps and battery; £50.—Engineer, Electricity Works, Newbury. [X7470]

### Triumph.

TRIUMPH, 2-speed, free engine, good order; £25.—Bright, Bridge St., Exeter. [4025]

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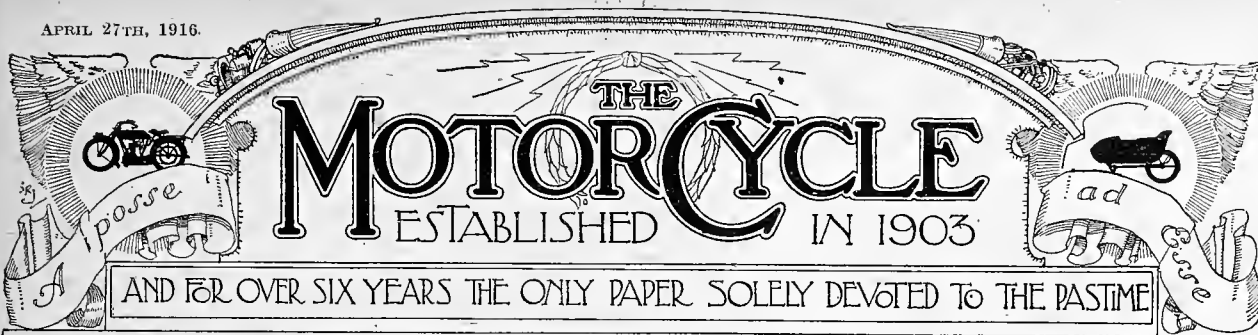
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## Clutches on Two-strokes.

**W**EIRD as are the outlines of America's first coquettings with the lightweight two-stroke movement, in one respect she seems to follow a wise lead. Too many British designers have adopted the axiom that as a two-stroke engine is childish easy to start, and as the price of the lightweights must be kept down, there is no need to incorporate a starting device or a free engine clutch. Our experience with tiny two-strokes has almost invariably been that they are poor starters, using the term in a peculiar sense. It is the easiest thing in the world to get the initial explosions; you can get them while wheeling the machine out of its shed if everything is in tune. But whereas the initial explosions of a cold four-stroke engine are normal explosions, with vim and power behind them, the initial explosions of a two-stroke are almost always of the four-stroke type, and though the engine will fire at the first push, it fires feebly, and takes some while to pick up and to settle down into the proper two-stroke burr. When we invested in our first two-stroke lightweight we used to paddle out of the shed, four-stroking merrily, and as soon as a slight up-grade was encountered in the road outside the gate the engine got wearier and wearier, and usually stopped dead a few yards up the road. After a few humiliations of this kind, we adopted the practice of warming it up on the stand before leaving the garage. Now and then we have sampled lightweights which will two-stroke instantaneously from cold, but most two-strokes expect a little humouring, and therefore many of them would be the better for a starting device, whether or not a free engine clutch be fitted. As a matter of fact, the handle-bar clutch would serve this need well; one would then start the engine four-stroking by paddling the machine, disengage the clutch after a few explosions, and go ahead when the engine had settled down to its normal running.

## The Taxation Proposals and Recruiting.

**A** POINT which was brought up in a letter appearing in our last issue in opposition to the new taxes deserves more than passing attention. It is the possibility that young men who are at present just able to afford motor bicycles may be bound to give up their machines by reason of the increased cost of owning and running them. At first sight there may appear no particular hardship in this, but it must be remembered that the ranks of practically all the specialised Services of the British Army have been filled by men whose interest in things mechanical has been aroused entirely by their experience with motor cycles and motor cars. These men have been able to start using their motor vehicles whilst quite young, and have thus gradually become amateur mechanics and automatically ideal candidates for the different mechanical sections included in our efficient Army. It is no exaggeration to say that the quick manner in which recruits have been able to grasp the intricacies of a machine gun, of big artillery, ordnance repairs, flying machine repairs, and in fact the numerous details of any complicated machine of war, is due in a large measure to their practical interest in mechanics excited by experience with a motor vehicle. Now, when it is remembered that these, in the majority of cases, have to serve their motor cycle novitiate on a third or fourth hand machine, which is second to none in the matter of giving first-hand practice, but is valued at only about ten pounds, it will be seen how unfair the new taxes are, and how they may redound in a way disadvantageous to the interests of the country. The correspondent already referred to plaintively asked what sport and industry have furnished flying men, A.S.C. and M.M.G. units, with material such as has been recruited from the ranks of motor cyclists. How many men, too, knew they had any mechanical proclivities until they handled a motor cycle?





### A Correction.

I let myself be betrayed into a bad slip the other week when I described a two-stroke as developing double the power of a four-stroke of similar c.c. Obviously, the shorter induction period of a two-stroke handicaps it per firing stroke, and the power proportion in favour of the two-stroke is therefore only about 4:3 instead of 2:1, as I falsely stated in a recent paragraph.

### Spark Advance for Dixie Magnetos.

One or two readers who have consulted me on the above topic may be grateful to Sapper W. F. Messenger for the following instructions: "Turn off the bosses which hold the ball for snapping on the magneto cover; fit the two contacts and the condenser on to a brass 'fiddle,' the fiddle being turned to fit the spigot made when the two bosses above mentioned are removed. Fasten the whole in place by a flat spring tongue, after the fashion of the securing spring on a Bosch magneto." This conversion was carried out for Sapper Messenger by Messrs. Parker and Rice, of Park Road North, Acton, W. It is described as having two weaknesses—it required a very stiff spring to prevent the cam from lifting the fiddle in lieu of opening the platina; and both water and dust had fairly easy access to the points. But Sapper Messenger describes it as a good job, and says the makers have doubtless perfected it by now, as his was one of the earliest conversions which they undertook.

### Decarbonising Four-cylinders.

I lent a grimy hand at the job of decarbonising one of the latest water-cooled American four-cylinder cars last week, and noticed with deep interest that the owner (an amateur) completed the job in a few minutes under two hours, a lesser time than the owners of many twin-cylinder motor bicycles normally devote to the same work. But the engine was of peculiar design, resembling the Ford, in that its engine was sliced horizontally across at the level of the valve seats, the entire top of the water jacket lifting off after a dozen nuts were unscrewed. If it is possible to get a simple gas and water-tight joint on such an engine, a similar construction should be quite adaptable to air-cooled four-cylinder motor cycle engines, where the problem is not complicated by any water joint. In this case one of the main points urged against the four-cylinder bicycles in our recent discussion (viz., the labour of decarbonisation) might be ruled out at one swoop. On the engine under notice a simple copper-asbestos washer appeared thoroughly efficient in sealing the combined gas and water joint, provided a certain obvious routine were observed in tightening down the securing nuts; the owner, needless to say, commenced by tightening down the central nuts first, then those at the two ends; and he gave each nut a turn or two in series. Incidentally, this mode of construction gives the maker a chance to

machine the inside of the cylinder head, and gives the user a chance to scrape it thoroughly; whereas with the average motor bicycle engine, the inside of the head is left rough, and the rider can never scrape and polish it up afterwards as he would wish to do. But the detachable cylinder-head went out with the old De Dion 2¾ h.p. engine, and few people have shown much enthusiasm for it since those days. Cannot we be trusted with it again? It has obvious merits even on single cylinders, and the main difficulty, of anchoring its supporting bolts firmly in an aluminium crank case, is surely not insuperable.

### Wanted, a Quick-access Carrier Case.

I rather wonder that no accessory maker has brought out a carrier luggage case which can be opened in a few seconds without unfastening any straps. So many riders use their machines for various business purposes that a quick-access luggage case would be very handy. I believe a sort of sliding Noah's ark case used to be sold by Dunhills, and one or two makers sell lockable bags attached to the carrier by claw-clips on their undersides, but the latter are apt to lose their shape when the lock tongues cease to register. There would be fair sales for a case made on the lines of a glorified matchbox, with the outer casing stiffened by metal, the front end sealed, and the sliding drawer fastened by a spring catch with an optional lock.

### Unscrupulous Trading.

I do not suppose that every dealer would reckon the following as a case of unscrupulous trading, but I state the case in the conviction that it is nothing less. A young canvasser, travelling one of the hilliest counties in Great Britain with rather heavy samples, consulted a local agent about a sidecar outfit, naming his price limit, which was distinctly too low. The dealer unloaded on to his innocent client a 1912 3½ h.p. machine and sidecar, in fair condition, fitted with an obsolete type of crankshaft two-speed gear, affording an emergency ratio of about 7 to 1 in conjunction with a very small pulley diameter. The price charged was fair. Needless to say, the embryo motor cyclist has experienced some very trying times on hills. He has denounced motor cycling in unmeasured terms to many possible purchasers, who watched his unhappy experiment with keen interest; and though he is now acquiring sufficient knowledge to see that his own victimisation does not rule all motor cycles out of court, he has done untold harm in his own district. The dealer ought to have said frankly, "Nobody can sell you a machine which will do your work at your price; come back when you have saved another £20." He has actually injured his own future trade to an incredible degree in order to clear out a machine which would easily have fetched its value in a district where it would rank as roadworthy.

## NAVAL AND MILITARY NOTES.

MOTOR CYCLISTS IN THE SERVICES SEND NEWS FROM FAR AND NEAR.

## FROM A REPAIR BASE.

S. A. M. WHITHAM is a name that will be familiar to many readers, as, apart from his short connection with the editorial staff of *The Motor Cycle*, he is well known as a successful track rider. For nearly nine months now he has been at a repair base in France working on despatch riders' machines. In a recent letter he writes very cheerfully, and tells us, as have others in similar positions, that he has learnt quite a lot on his new job.

you know, one rides on the right, the sidecar being on the left; consequently any attempt to pull out into the middle of the road, at even a moderate speed, results in the sidecar wheel acting as its brother on an aeroplane, and leaving *terra firma* for a less stable element. After the preliminary shock this becomes a fascinating pastime, though not one to be indulged in when meeting fast staff cars.

## At Gallipoli.

"On Lemnos Island I rode a Scott (solo) and a Douglas. The Scott was remarkable for the fact that it refused to skid to any great extent in the loose sand, even when taking a sharp turn that ordinarily would send one to earth very promptly.

"I landed a Douglas on the beach at Suvla on August 8th, and had to push it from the water's edge through very loose sand for a few hundred yards. It was extremely hot, and shells (mostly of the 'dud' or non-exploding variety) fell around in moderate quantities. After the first week at Suvla I spent the greater part of my time behind a machine gun, with an occasional short run on a dilapidated 'Dug.'

"A little trip across the water to Imbros, in November, gave me an opportunity to try a Clyno outfit, which was being used as a sort of speed delivery van for aeroplane spares, mails, and, in fact, any old 'clobber.' It was a great joy to ride something with two fairly hefty cylinders, on some sort of a road.

## Few Machines at Malta.

"A large proportion of the motor cycles at Suvla were the new counter-



Miss Dora Rowlandson, sister of Lt. S. A. Rowlandson, A.S.C. (M.T.) mounted upon the latter's 5-6 h.p. single-cylinder Rudge. The machine is still going well after many miles of competition work before the war. Since Rowlandson went on active service it has been used by his mother and sister.

shaft Triumphs. They seemed capable of anything, and certainly the riders could take them anywhere. I must not mention the brigade or division, but I would back those particular riders against any picked team in a competition for accomplishing the impossible.

"There are disgracefully few motor cycles in Malta, but after weeks of waiting I have at last discovered one 'bus' worth mentioning. A, twin Zenith, very red, exhaust pipes like drain pipes, and bars nearly to the ground.

"Also I have seen one happy reminder of the Portsmouth Road on a Sunday—a mysterious speed merchant, complete with one flapper on carrier, a practice which I know you don't uphold. Neither do I, in theory—but give me half a chance. . . ."

## RAPID PROMOTION.

A. J. PALMER, formerly assistant cashier to *The Motor Cycle*, has been promoted to temporary Captain in the Motor Machine Gun Service. Captain Palmer's promotion has been rapid. He enlisted in the No. 5 (Coventry) Battery in the autumn of 1914, was soon a sergeant, then sergeant-major, subsequently being granted a commission, which led to his captaincy.

## PRESENT DAY COMMANDEERING.

LAST week a Midland rider had his Douglas motor cycle requisitioned by the military authorities who were stationed in his district repairing telephone wires. This is the first time we have heard of motor cycles being commandeered since the early days of the war.

## CAPTAINCY FOR WELL-KNOWN MOTOR CYCLIST.

JACK WOODHOUSE, the well-known Midland rider of Quadrant and Precision machines, is now Capt. Jack Woodhouse, Flight Commander, R.F.C. He has seen considerable service in France, and has been awarded the Military Cross. He has been at home on leave for a few days.

## EXPERIENCES IN FRANCE, GALLI-POLI, AND MALTA.

WE are indebted to P.O. G. L. Rossiter, of the R.N. Armoured Car Division, for the letter we reproduce in *extenso* below. Some readers may think that news of doings at Gallipoli are now rather out of date, but in this case the matter is too interesting to be omitted on that score:

"I was in France for a time with a Scott-Vickers sidecar machine gun outfit, and although occasionally under shell fire, in Dunkirk, I did not see any action with the machine. However, I learnt to ride with the sidecar wheel off the ground, as most roads have a considerable amount of camber, and, as



Three R.F.C. mechanics in a French town. The man riding the solo P. and M. is Sgt. H. Cook, now in charge of a P. and M. army repair depot in France, and formerly in the employ of Messrs. Phelon and Moore. The Royal Flying Corps, it will be remembered, use motor cycles of this make exclusively.

# THE AERO ENGINE.

## HOW WAR-TIME DEVELOPMENTS MAY HELP MOTOR CYCLE DESIGN.

Previous instalments appeared in "The Motor Cycle" of December 16th, February 24th, and March 9th.

**I**N arranging this series of articles upon the aero engine, the various types have been dealt with in a sequence chosen so as to commence with varieties that are furthest removed from the common standard motor car type and thence to progress towards the latter. Where a close similarity exists between the aero engine and that of the motor cycle special notice is drawn.

The next in order will be the air-cooled V engine, and afterwards the water-cooled V and the line ahead water-cooled six-cylinder. Previous to the war, in this country the engine chiefly in favour with the authorities was the eight-cylinder V type Renault, which possessed over the Gnome and other types certain features of superiority in the matter of fuel and oil consumption, and the ability to run over longer periods before dismantling for cleaning and wear became necessary. It is, perhaps, true to say that the 70 h.p. Renault found greater exclusive favour over here than it did in the country of its origin—France. This engine has eight air-cooled cylinders of 96 mm. bore and 140 mm. stroke, set at right angles in two groups of four, developing 70 h.p. at 1,800 r.p.m.

### The Cult of the V Engine.

The advantages of the eight-cylinder 90° V design are, broadly, a very fair balance, an even torque, accessibility, and compactness in front view. Although the type scores considerably over the six-cylinder line ahead type in the matter of shortness of crank case and of crankshaft, yet it seems unquestionable that it is, not only on that ground but as regards balance as well, inferior to the radial engine. However, as the V engine sits very compactly into the nose of an aeroplane fuselage it has met with some considerable favour. That the V engine has been popular proves but little; any type of engine which proves its reliability, power, and suitability for any particular purpose will be devoted by the world in general to that purpose forthwith, and moreover is likely to be copied and duplicated for that purpose, without the market standing still to await the perfection of any design theoretically more desirable.

To return to the Renault engine, although its original lines were suggested by deduction rather than by following motor cycle practice, yet it has much in common with the motor cycle engine. The cylinder barrels are of cast iron with a multitude of fine cooling fins, the head, also of cast iron, is detachable, and

four long bolts passing through a spider above the head clamp the latter to the cylinder and the cylinder to the crank case. The mechanically-operated inlet valve is at the cylinder side with the exhaust valve above, an arrangement which is good from several points of view, since the cooling effect of the inlet gases is available close to the cylinder walls, also the inlet gases in their travel pass over the face of the exhaust valve, and serve to soothe its temperature.

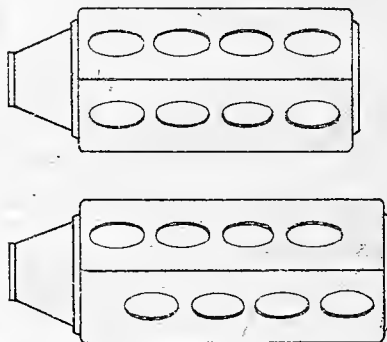
### On Valve Disposition.

Although from a theoretical point of view the hemispherical combustion chamber with overhead valves is more desirable, yet it is possible that from a mechanical point of view, so far as the air-cooled cylinder is concerned, the L-head arrangement of the

Renault may be better practice. In any case, there can be little doubt that this type of L head is better than the side-by-side valve arrangement generally adopted in motor cycle design. It may be taken as a hard and fast rule that the seating of any exhaust valve in any type of engine must be directly cooled, that is to say, the exterior of the seating must either be provided with ribs to conduct the heat away so that the air may (unwillingly) absorb it, or it must be in direct contact with the contents of the jacket if water cooling is used. In any but very low efficiency engines exhaust valves in detachable cages are a mistake. It is well-nigh impossible to obtain a sufficiently good heat contact between the cage and the cylinder head walls, and trouble

with the seat or the valve is assured. With the inlet valve, on the other hand, owing to the virtue of the cool inlet gases a detachable seat is quite sound and permissible.

Now if an air-cooled cylinder be designed with both valves overhead, one thing becomes at once obvious. Unless the exhaust valve seat is detachable it will be impossible to remove an exhaust valve without taking off the whole cylinder. This is a point wholly repugnant to the motor cycle user, but apparently not so to the aero engine user, as will be referred to later. Added to that the motor cyclist has a most unholy fear of a broken overhead valve falling on his piston crown and wrecking the engine. Maybe this shyness on his part is the fruit of bitter experience; however, the fact remains that breakages are not at all common on modern overhead valve engines in which the valves are of correct design and of suitable material.



(Upper) Crank case in plan showing how the pairs of cylinders in an eight V can be placed opposite if a knuckle-ended master-connecting rod is used.

(Lower) The meaning of staggered cylinders.

**The Aero Engine.—**

It is comparatively a simple matter to allow access to the exhaust valve in an L-headed engine with the inlet above the exhaust. The former valve is given a detachable seating which on removal will permit the removal of the exhaust through the orifice thus displayed. The arrangement is made clear in one of the accompanying diagrams. The advantages of such L-head cylinder design were made so clear in the article by Mr. Granville E. Bradshaw which appeared in *The Motor Cycle* on March 30th last that further discussion by the present writer would be superfluous.

Whilst dealing with the subject of valve positioning, reference may be made to the very simple plan used in the original Austro-Daimler aero engine to make possible in an overhead valve design the removal of the exhaust valve without detaching the complete cylinder, and at the same time to allow the seat of the exhaust valve to remain part and parcel of the cylinder head, in direct contact with the cooling water.

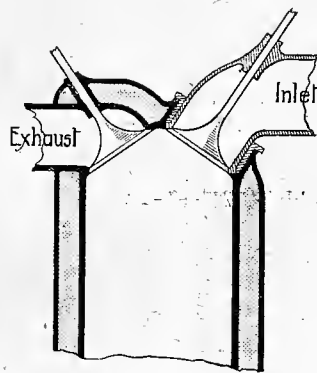
The principle of the design is shown in the attached sketch. Both valves are overhead, but the inlet is carried in a detachable seating. This, when removed, offers an orifice of sufficient size to allow the exhaust valve to pass through after the latter has been undone and allowed to drop completely into the cylinder. This arrangement does not permit a new exhaust valve to be ground in. Of course, it must be remembered that the valves on so large an engine are of considerable size, so that there is some hope of manipulating the exhaust in and out of the inlet orifice with the fingers, but it is questionable whether the small valves and orifices of a motor cycle engine would be other than very tiresome to handle under like circumstances.

**The Renault Crankshaft and Connecting Rods.**

To return, however, to the Renault engine. About the crankshaft bearings there is a peculiarity that has some theoretical advantage concerning the precise nature of which the writer must admit ignorance. The outer bearings are ball races, whilst the centre three are plain. This design has in practice a disadvantage. If the centre plain bearings wear, it is not possible to take up the slack in the usual way, because the crankshaft as a whole is definitely positioned and centred by the ball races. Wear in the upper half of the plain bearing liners necessitates, therefore, that the bearing liners be entirely renewed and lined up afresh, a matter which one would think is more than troublesome on active service, the conditions of which are, after all, the limiting factors of aero engine design.

Another feature which is to be found on the Renault engine almost alone is the use of a hinged connecting

rod; that is to say, the connecting rod of one cylinder on one side of the V utilises the same crank pin as the connecting rod of the cylinder in the same plane on the opposite side of the V. In the Renault arrangement one connecting rod is the master, and carries in its end the big end bearing. The second connecting rod has no direct bearing on the crank pin, but is hinged to the master rod as close to the bearing of the latter as possible. The object of this design is to bring the reciprocating masses of the connecting rods and pistons in the opposite cylinders into the same plane, and thereby avoid unnecessary vibration, besides more particularly avoiding the necessity of offsetting or overhanging the bearings of the connecting rod, and at the same time keeping the length of the engine as small as possible. If each connecting rod of each pair has a big end bearing of reasonable size, then the crank pin must be made longer to accommodate the two, and unless overhung bearings are used the cylinders can no longer be placed opposite one another, but must be staggered, so that the overall length of the engine is increased.



(Left) Arrangement of L head engine with overhead exhaust valve, which can be removed through inlet valve hole.

(Right) Austro-Daimler overhead valve design in which exhaust seats direct on cylinder wall. The inlet valve is in a detachable cage of sufficient size to allow exhaust to be removed through inlet orifice after being passed right into the cylinder.

The hinged connecting rod design does not, however, appear to have met with general favour, possibly because of the effect it has on the comparative movement of the two pistons. The writer does not think that it is likely to survive now that the roller bearing big end is coming into its own, since the roller bearing, particularly of the type used on the A.B.C. motor cycle engine, is quite narrow, and if staggering the cylinders is still necessary

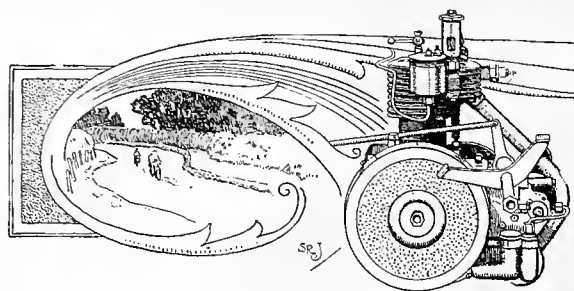
the amount added to the length of the whole engine is too small to be worth worrying about. These considerations take no count of the superiority of the roller bearing in other respects, including self-lubrication.

The Renault is one of the few air-cooled aero engines that is provided with a centrifugal fan, carried at the rear end of the crank case, and a suitable casing around the cylinders to direct the cooling air evenly to the desired places. In England the general practice used to be to remove the fan and casing on engine-in-front or "tractor" machines, and to let the stream from the propeller, aided by suitable scoops, do the work. On "pusher" machines the fan is retained. For an air-cooled engine that is expected to give its maximum power continuously and steadily the speed of revolution of the Renault is high, compared with the Gnome, for instance. The Renault runs at 1,800 r.p.m. This speed is too high for propeller efficiency, a large propeller running at a low speed being desirable, so a 2 to 1 reduction gear is provided for the main drive. As a matter of fact, this reduction gear is utilised to rotate the camshaft in lieu of the ordinary distribution gear.

M.T.

(To be continued.)





## TOP FEED CARBURETTERS.

The Pros and Cons by Manufacturers.

By "IXION."

ONE or two manufacturers have made tardy reply to the challenge implied in recent correspondence on the subject of carburetters designed to take their petrol in at the top of the float chamber, and I confess that in my eyes the designers have made out a strong case for the innovation.

The point which they unanimously place first is that wear of the float needle is greatly retarded by the new arrangement. Any rider who has run one and the same machine for several years will be aware that the ordinary float needle develops a "shoulder" on its point after a comparatively brief mileage, and that once a "shoulder" has developed it is hardly worth while trying to grind the point true. No means are available for holding the point true in the seating; the needle is too light to be slotted for an oscillating tool, and the metal is so soft that the least error from the vertical destroys the point beyond hope of repair. Flooding and waste of fuel result as soon as a needle ceases to be petrol tight. The manufacturers have proved beyond cavil in their exhaustive tests and repair experience that the hammering of the float weights vastly exaggerates wear of the needle in bottom feed carburetters, and that the needle of a top feed carburetter, being relieved of this hammering, lasts reasonably well under the comparatively silky motion imparted to it by the gentle ebb and flow of the petrol.

### Advantages of Top Feed.

Secondly, the float chamber cap can no longer become unscrewed by vibration—a not uncommon mishap which the duffer type of rider (for whom makers ought certainly to cater) is slow to diagnose.

Thirdly, the tinkerer cannot reassemble a top feed float chamber incorrectly, as tinkers often do with the bobweight type.

Fourthly, there are no bobweights to give trouble. Readers may say such trouble

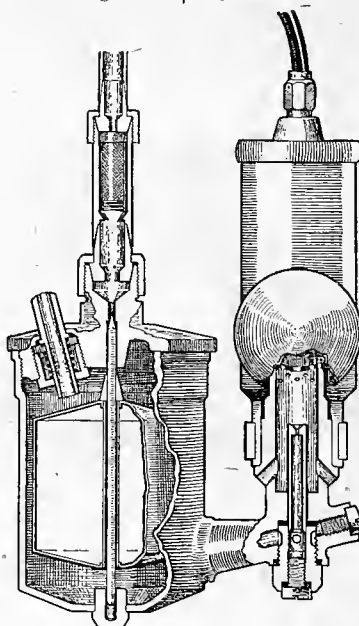
is rare, but, though I run few machines to destruction, I am hung up with bobweight trouble at least once a year on an average; and, *a fortiori*, the commoner type of rider, who wears his machine half out, suffers from it more than I do.

Fifthly, the top feed carburetter can be flooded for starting purposes without waste of petrol; if a finger be placed over the venthole whilst flooding the entire excess of petrol escapes *via* the jet, and is utilised by the engine.

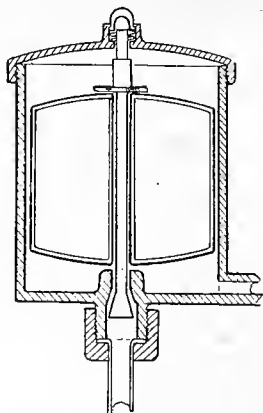
### Petrol Filters.

On the alleged frequency of choked filters, something, of course, depends on the filter. Good filters have plenty of gauze area. For example, the B. and B. type consists of a pencil-shaped tube of gauze, held by a spring in a chamber of greater diameter than the gauze tube. This will not choke within any reasonable period under any circumstances, though the makers find that the best filters get silted up in six months or so with a fluffy substance of which they cannot trace the origin; I should ascribe it to straining substances used at the American refineries. The average bottom feed carburetter has no filter at all, in which case the dirt collects round the needle valve seating and produces intermittent flooding. Those filters consisting of a microscopic cup of gauze are worse than useless, and should be scrapped at sight. Given a decent filter, the top feed may be absolved on the score of a choked petrol pipe.

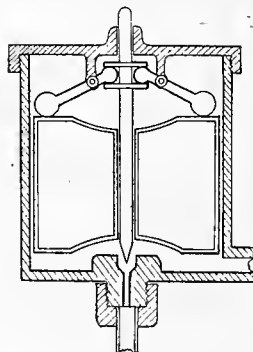
In my judgment; the factor of increased needle valve durability settled the controversy. But I should couple with this verdict in favour of the top feed a rider to the effect that some makers should redesign the attachments of their petrol pipes and float chamber lids; if both are screwed joints, it becomes a simple matter for a duffer to wreck his petrol pipe in the effort to uncover his float chamber or cleanse the pipe.



Sectional view of a top feed carburetter.



Carburetter chamber with inverted needle valve and no toggles.



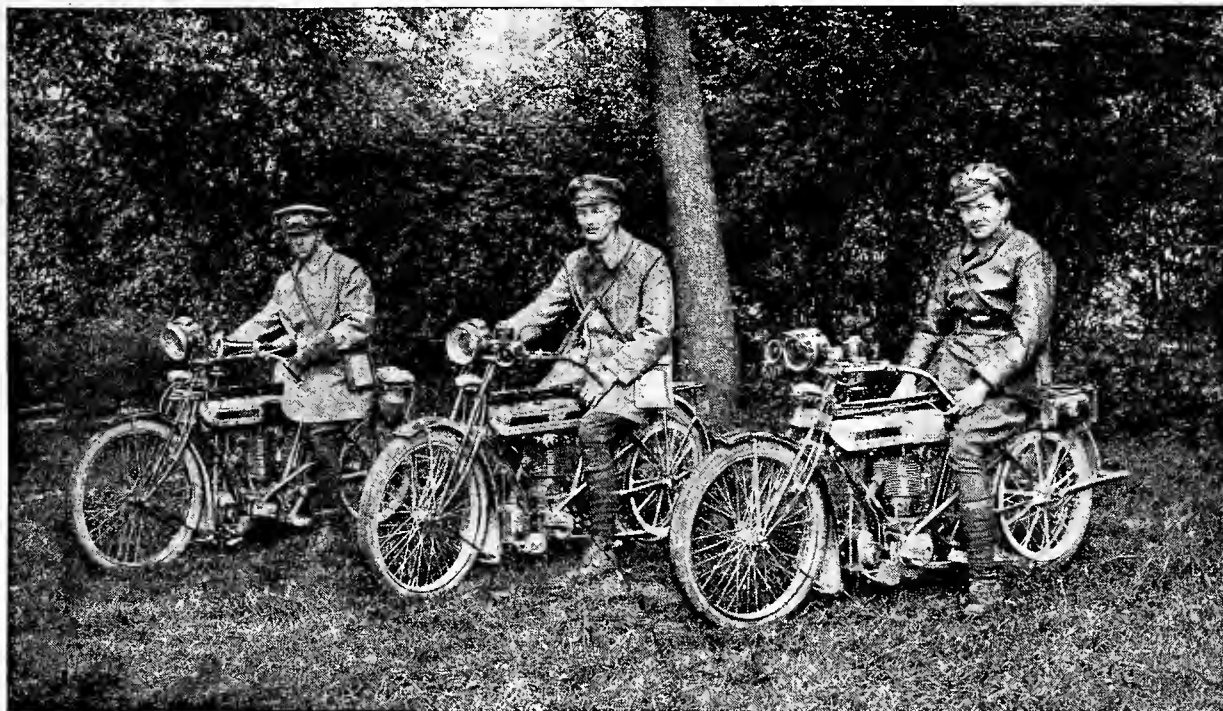
Float chamber with toggles and needle pointed at the lower end.

**Lance-Cpl. H. G. Smith, Amm. Sub.Park, B.E.F., writes :****"17/1/16.**

"I am enclosing a photograph which may prove of interest to you. The three machines arrived in France on Sept. 25th, 1914, and since that date have been continually running on Despatch work, over the rough roads of Northern France, without ever having been to a repair depot.

"All three are still running in excellent condition, and I have never once been held up on the road except for belts and tyres.

"I have become so impressed with the strength, power, and absolute reliability of the Triumph, that I have felt compelled to write you these few lines in appreciation."

**TRIUMPH CYCLE CO., LTD., COVENTRY.****TRIUMPH**

## A NEW M.C. COAT.



It is essential that you should protect yourself against the vagaries of Spring weather.

Dunhills' New M.C. Coat will prove an excellent weatherproof for your tour.

It is made of proofed twill with a lining of oil cambric, and is thus impervious to any weather.

A detachable fleece lining is very fashionable with many motor cyclists. It is most useful during the climatic changes at this period of the year.

PRICE £3-15-0

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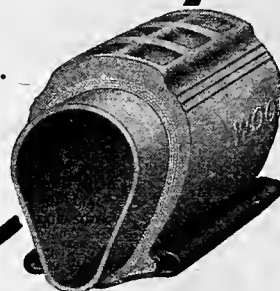
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Birmingham. Leeds. Manchester.

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## A SPECIAL LODGE

PLUG  
FOR

2-Stroke.

A model expressly designed to overcome the particular causes of trouble met with in all two-stroke engines.

Price 4/- each.

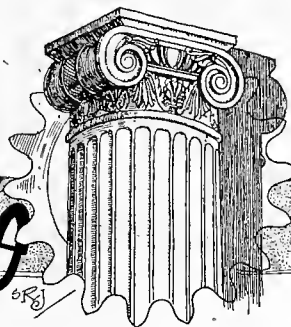
Of all dealers; or post free by return, when remittance accompanies order, direct from the makers—

THE LODGE SPARKING  
PLUG CO., LTD.,  
BIRMINGHAM AND  
RUGBY.



## ROAD TEST OF BINKS FUEL.

### Comparative Trials Between Binks Fuel and Petrol.



FOR some time past motorists have, very naturally, taken a lively interest in the various schemes which promise a saving in the fuel bill, and the present scarcity of petrol has just about brought matters to a head so far as most motor cyclists are concerned. The Binks system, based on the use of a heavy fuel costing 1s. 3d. per gallon, known as the Binks XXX fuel, is one that has brought a ceaseless flow of enquiries to these offices, and it was with unusual interest that we accepted the courteous offer of Mr. C. Binks to subject his system to a practical road test, a machine belonging to a member of our staff being duly equipped for that purpose.

The claims of the inventor as regards this fuel are already well known, being briefly that, from a practical standpoint, it possesses most of the virtues of petrol and none of the harmful and obnoxious features of paraffin. A Binks carburettor is not essential to its use, though naturally very much better results are obtained by following the Binks system all through. Any good carburettor, fitted with a hot air intake, would probably yield satisfactory results. The chief disadvantage of the fuel is that an engine cannot be started on it from cold, and therefore a subsidiary tank and a two-way tap for a supply of petrol for starting are necessary.

#### Description of Binks Fuel.

The Binks XXX and the BXA fuels are approximately identical. Both are entirely colourless fluids, possessing neither the oily blue tints nor the permeating odours of paraffin. Their specific gravity is .772, and their flashpoint (*i.e.*, the temperature at which an inflammable vapour is given off) is 78° F., while 95% of the fluid distils over at 398° F.

These fuels are not odourless, and being less volatile than petrol their odour is more clinging, but in this respect they are much less offensive than lamp oil.

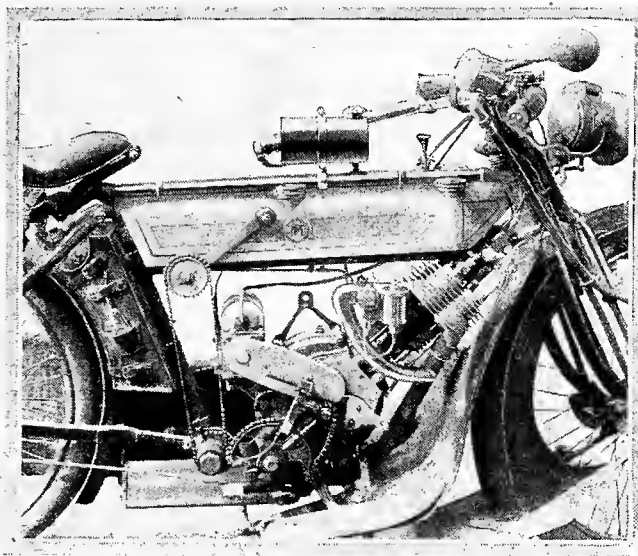
Unless a portion of one's clothing actually becomes saturated with the fluid, the smell thereof does not permanently attach itself to the person of the rider, as in the case of petroleum, the odour from the exhaust being almost unnoticeable.

#### Machine Used for the Trial.

The machine on which our tests have been carried out is a 1914 3½ h.p. P. and M., with sidecar attached. The weight of the rider and passenger totalled approximately twenty stone, and it may be mentioned that this type of machine is the least

adapted for the use of a heavy fuel. The steady impulse of a twin is almost essential, and, moreover, we may add that the engine of this particular P. and M. is always susceptible to a harmless piston knock, which a heavy fuel considerably accentuates.

A neat round tank, holding about 1½ pints, was fitted to the top bar, and the machine was equipped with a Binks three-jet horizontal carburettor in place of the P. and M. single-jet carburettor previously used. No further alterations were made.



The special hot air intake seen fitted to the three-jet Binks carburettor to facilitate evaporation when running on the special fuel.

#### First Impressions on the Road.

On leaving the Binks works at Eccles it was necessary for us to ride across Manchester, and in negotiating the dense traffic the machine proved very considerably more controllable and much more pleasant to handle than it had proved with the old carburettor and with petrol as the fuel. The manner in which it would tick over, responding instantly to a movement of the throttle lever, was most gratifying, and it was difficult to believe we were using a fuel little lighter than ordinary lamp oil. It was not, indeed, till we had gained the open country, with roads and weather of the worst imaginable, that the presence of the heavy fuel was felt, for it was then found necessary to handle the "spark" control with care on opening the throttle, otherwise a knock ensued.



**Road Test of Binks Fuel.—**

The journey home included several long and trying mountain ascents, and owing to gale and gradient it was on one occasion necessary to proceed for five miles on low gear, the engine pulling better at the end of the climb than previously, owing, doubtless, to the thorough warming up of the hot air intake and induction pipe. Ample power was obtained, and there were no signs of overheating throughout the journey, but owing to the eternal knock at excessive throttle openings it was almost impossible to permit the engine to "rev." with ignition fully advanced.

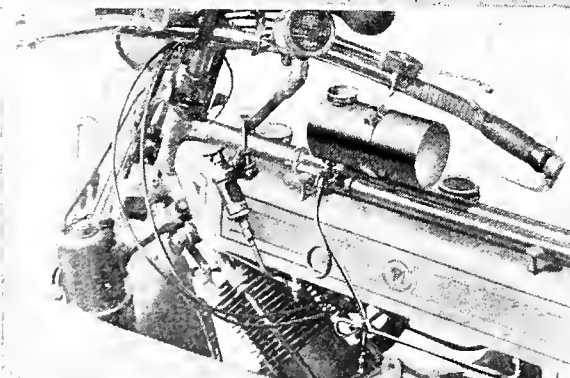
**An Important Test.**

One of the most gratifying, and probably the most important, of the tests we have been able to complete was with regard to the quantity of carbon deposited in the cylinders when the heavy fuel is used. If a heavy fuel can be entirely vaporised there is nothing whatever against its use, but unless an elaborate vaporiser be incorporated, the difficulty generally lies in so breaking up the atoms of fuel that it reaches the cylinder in the form of a perfect vapour. Unless this be done, liquid particles of the fuel are drawn into the cylinder, with the result that an incomplete explosion and excessive carbonisation ensue. Even more serious is the fact that these liquid particles get past the cylinder rings, and thin down the engine oil. Bad carburation, therefore, with its numerous undesirable results, is immediately shown by excessive carbonisation and by traces of the fuel in the cylinder oil.

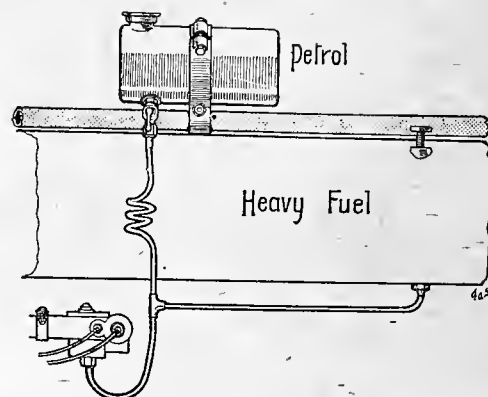
Our experiments with regard to this point are certainly the most reassuring, and probably the most important, we have been able to make. It is difficult to believe that, by the Binks system, the heavy fuel is more completely used up than petrol, yet all our trials point to this. We can only state the results of these carefully made tests, giving no guarantee that every rider will be able to obtain the same results.

**No Carbon Deposit.**

Before starting for Manchester, both valve caps were taken out and their inner faces cleaned and polished. Also a new sparking plug was fitted, and the journey of approximately seventy miles completed on petrol. Both caps were then removed, and the



Showing how the small tank of petrol for starting purposes and the interconnection of the petrol and special fuel feeds are fitted on the  $3\frac{1}{2}$  h.p. P. and M.



Simple method of connecting up the petrol and heavy fuel feeds.

exhaust cap was found to be covered with a thin film of carbon, which could be scaled off from the smooth surface of the brass much as old enamel can be scaled from a rusty frame. The plug, also, was discoloured, and after these had been minutely cleaned and replaced, the oil was drained from the crank case and a sample kept.

The return journey was made on the Binks fuel, and the process repeated on reaching home. It was found that there was no deposit whatever on the valve caps and sparking plug, excepting an almost imperceptible coating of soot, evidently caused by a rich mixture in starting, and which could be removed by rubbing with a duster. The porcelain of the sparking plug was quite clean, and no trace of the fuel could be found in the lubricating oil.

A heavy grade cylinder oil had been used, and the fact that no traces of the fuel find their way to the crank case is further proved by the stiffness of the engine when starting from cold. If the oil became diluted with the fuel this would at once be shown by the freedom of the piston when cold, but the engine "gums up" when Binks spirit has been used to the same extent as when petrol was the fuel.

Both these tests have been backed by more recent observation since adopting the Binks system.

**Tests for Consumption.**

As regards consumption and general efficiency, each comparative test was made over the same stretch of road, a distance of from 20 to 25 miles being covered on each occasion. It may be added that the engine was run at maximum load—that is to say, the total weight carried was as much as any sane individual would think of imposing upon a  $3\frac{1}{2}$  h.p. machine—with apologies to the occupant of the sidecar.

**FIRST TEST, AGAINST STRONG WIND, SEVERAL STIFF GRADIENTS ENCOUNTERED.**

Fuel.	Miles per gal.	Miles per hour.
Shell spirit ...	44½	20.5
Binks XXX fuel ...	51½	18

This test was not considered satisfactory, and since several shorter trials produced similar results, the carburettor was readjusted. Time was still lost when the Binks fuel was used by the necessity for constantly having to retard the firing point, and finally the compression of the engine was reduced by inserting a  $\frac{1}{16}$  in. copper packing between the cylinder and the crank case. This almost cured the knock, and better

**Road Test of Binks Fuel.—**

running was experienced. The following results were then produced:

ORDINARY GOING, NO WIND, DRY ROADS.			
Fuel.	Miles per gal.	Miles per hour.	
Shell spirit ... ..	72.8	27.4	
Binks BXA ... ..	88.	26.4	

LONG UP-GRADES AGAINST STRONG WIND.			
Fuel.	Miles per gal.	Miles per hour.	
Shell ... ..	48.	20.6	
Binks BXA ... ..	60.8	19.8	

No difference was noticeable between the XXX and the BXA, but on all tests taken the Binks fuel produced a better mileage per gallon than petrol at a slight loss of road speed. Mr. Binks states that most standard touring machines prove slightly faster on Binks fuel than on petrol, and this would probably prove to be so in the case of twin-cylinder machines, as the fuel gives a very strong explosion, but in the case of a "single" it is almost impossible to press the engine above a certain road speed.

**Disadvantages of the Fuel.**

What, then, are the disadvantages of the Binks fuel? In the case of a single-cylinder machine the greatest of these is its tendency to enhance the noises

caused by loose bearings, and to create a knock, both due to the suddenness of explosion. This can be reduced by reducing the compression, but if the compression be so far reduced as to effect an absolute cure, the running of the engine would hardly suit the speed merchant.

Secondly, difficulty in starting. Unless the carburetter be quite drained of the heavy fuel, this remains in the bottom of the float chamber, and is difficult to get rid of when attempting to start up on petrol. A tap for draining the pipe and float chamber would be useful. A careful scrutiny must be made for air leaks.

Thirdly, the odour of this fuel is more clinging than that of petrol. A shield over the air intake below the jets would prevent spray from blowing on to the right leg of the rider, and tend towards cleanliness.

Finally, the motor cyclist who adopts this or similar systems must make up his mind that careful adjustments will prove necessary ere the best results can be obtained. With any type of carburetter a hot air intake is desirable, and with single-cylinder machines it will probably prove necessary to reduce the compression. Imperfect carburation should not be allowed to continue, and freedom of exhaust is more necessary than if petrol be the fuel. H.M.B.

## OVERHEATED SPARKING PLUGS.

**D**URING the last six months I have owned two machines which differ in an important respect from their innumerable predecessors. You cannot make their engines "dry up." I don't say that illimitable laps all out on Brooklands might not engender some suspicion of fatigue, but it is simple fact that no sustained speed possible on English roads will cause "that tired feeling" in the engine. One of them is a four-stroke, the other a two-stroke, and they are both colossal "revvers." But this claim is only true of the engines. Every now and then, after a prolonged speed burst, the engine will suddenly pull up, and for some time I blamed the engine in both cases, whereas the real fact was that the electrodes of the sparking plugs had become incandescent, and were causing pre-ignition. I ought to have guessed what was happening, but muddled it out in my usual round-about fashion by an accident, when a sparking plug which I had discarded as useless proved to fire perfectly when cool. I believe that both these engines will overheat any sparking plug on the market, given suitable riding conditions, but the symptoms are naturally most pronounced in the case of plugs with spidery electrodes; the thicker the electrodes, the better they conduct heat, and the slower the plug is to get incandescent. This fact appears to supplement the existing case for bulkier sparking plugs, and a change of standard dimensions. If it ever comes, it will doubtless come slowly; but some authorities have already pleaded that the huge electrical voltages generated in magnetos demand heavier insulation than the present standard plug dimensions can contain. However that may be, it is irritating that two faultless engines should be spoilt for want of a ha'porth of tar, i.e., a plug which can be trusted to keep cool under work which the engine takes smilingly. I am told that the plug-heating propensities of two-strokes have led manufacturers to tackle this matter rather

energetically, and that we may soon get plugs which are to all intents and purposes proof against pre-ignition.



AN ITALIAN RIDER OF A 1916 8 h.p. SUNBEAM.

Signor Gustavo Cuocolo, of Milan, the owner, is an officer in the Italian Royal Engineers, and this is his fourth Sunbeam. He rides it solo, and judging by a recent letter he is highly delighted with its running and hill-climbing.

# "THE MOTOR CYCLE" RECRUITING SECTION.

## Central Office for Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

## Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

**C**OLONIALS still continue to present themselves for enlistment in the M.M.G.S., one of the latest recruits being Herbert Irons, of Dundee, who, after spending fourteen years as a rancher in the Argentine, paid his own expenses home specially to join this popular branch of the Service.

Several recruits journeyed to the last week's inspections by road. Among them were F. G. Sharp, who rode from Cheltenham to Coventry on his  $3\frac{1}{2}$  h.p. Triumph, and A. B. Hurry, of Cambridge, who came on a  $3\frac{1}{2}$  h.p. Sunbeam. One keen man actually push-cycled from Lichfield to Coventry. A recruit for the armoured car section drove over on his six-cylinder Sunbeam. Several other recruits were owners of cars.

A number of applications for enlistment having been received from Ireland, it is hoped in the near future to make special arrangements for the examination of such candidates before they have to cross the water.

In addition to the inspections of recruits announced last week in Bristol, Manchester, and London, two additional dates have been arranged, viz.:

COVENTRY.—Recruiting Office, Masonic Buildings, Tuesday, May 2nd, 11 a.m. till 4.30 p.m.

NOTTINGHAM.—Recruiting Office, Stamford Street, Wednesday, May 3rd, 2.30 p.m.

On Saturday, the 29th inst., Mr. Geoffrey Smith will be at *The Motor Cycle* offices, 20, Tudor Street, E.C., between 2 and 4.30 p.m. in order to test recruits.

## APPLICATION TO JOIN THE MOTOR MACHINE GUN SERVICE.

Name .....

Address .....

Chest measurement ..... Height .....

Group No. ....

or Age .....

Class No. ....

How long have you been a { motor cyclist? .....  
car driver? .....

Can you execute running repairs? .....

Are you fit for overseas service? .....

Occupation .....

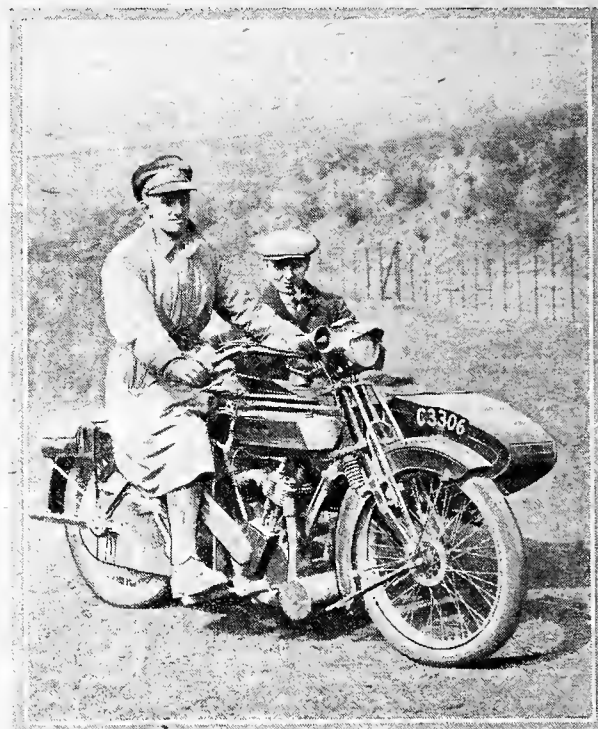
When are you called up? .....

WHAT DATE COULD YOU JOIN? .....

After filling in the above particulars return to:

MR. GEOFFREY SMITH,  
Inspecting Officer,  
19, Hertford Street,  
COVENTRY.

[Issue April 27th, 1916.]



Pte. Maurice Greenwood, A.S.C., a despatch rider and well-known motor cyclist of Todmorden, who is now home on leave.

Numerous applications have been received for transfers to the M.M.G.S., but these cannot be considered unless the application emanates from the candidate's Commanding Officer. Motor cyclists already in the Services should particularly note this announcement.

Motor cyclists and car drivers desiring to enlist should attend one of the inspections arranged, or, failing that, fill up the form on this page, when notification of further arrangements will be made by letter. The following are among recent accepted men:

Barnsby, E. R., Birmingham.  
Bartlett, W. G., Frome.  
Bass, W., Rushden.  
Bassett, H. K., Wolverhampton.  
Beaton, G., Stockton-on-Tees.  
Breeze, H., Eccleshall.  
Cartwright, H. A., Birmingham.  
Chandler, A. T., Small Heath.  
Clark, H. G., Bristol.  
Clutterbuck, Berkeley.  
Copestake, A. E., Marlow.  
Cox, W. R., Eastleigh.  
Cox, W. T., Bristol.  
Crabtree, E. C., Burslem.  
Cutler, W., Sutton Coldfield.  
Dawe, H. W., Dorchester.  
Floyd, A. H., St. Helens.  
Forbes, J. K., Aberdeen.  
Foy, M., Wokingham.  
Frost, C., Plymouth.  
Gardner, H. G., Bristol.  
Gardish, L., Hastings.  
Goldman, J., Bootle.  
Green, R. W., Belsey.  
Grundv, F., Huddersfield.  
Gullett, P. H., Plympton.  
Hawker, L. J., Bristol.  
Hay, D. H., Longmorn.  
Hay, R. N., Oxford.  
Hurry, A. B., Cambridge.  
Irons, H., Dundee.  
Jonathan, R. J., Abergavenny.  
Jones, M. G., Llangadfan.  
Kelsall, H., Hoylake.  
Lewis, G. L., Fradley.  
Loades, A., Grimsby.  
Luscombe, E. J., South Brent.  
MacIver, W., Fortrose.  
Marshall, G. L., Blaby.  
Mason, E., Wolverhampton.  
Morris, A. U., Cardiff.  
Myers, G., Keighley.  
Nolan, E. F., Llandudno.  
Northwood, W. T., Luton.  
Outram, H., Southport.  
Philip, K. A., Stalbridge.  
Randall, H. G., Royston.  
Reynolds, H. T. F., Exeter.  
Richardson, A. W., Wakefield.  
Richardson, H. O., Dewsbury.  
Saville, C., Morcott.  
Sharp, F. G., Cheltenham.  
Smith, J. F., Rowington.  
Smidow, W. J., Shepton Mallet.  
Stanley, G. H., Darlington.  
Stevens, R., Bristol.  
Till, F. T., Southport.  
Turvey, K., Bath.  
Ward, F. T., Wisbech.  
Webber, J. O., Exeter.  
Wenrett, W. J., Bristol.  
Wolverson, C., Wolverhampton.  
Young, J., Coventry.



## SPECIAL FEATURES

EASTER COMPETITIONS DESCRIBED AND ILLUSTRATED.  
ROAD TEST OF A NEW FUEL. TOP FEED CARBURETTORS.

## TIME TO LIGHT LAMPS

GREENWICH TIME.

Apr. 27th	...	7.43 p.m.
" 29th	...	7.46 "
May 1st	...	7.50 "
" 3rd	...	7.54 "

## Saved from the Deep.

About one hundred drums of petrol, representing some 44,000 gallons, have recently been found off the western coast of Sicily.

## British Machines for France.

Last week the Triumph Cycle Co., Ltd., received another large order from the French Government for 4 h.p. Triumph motor cycles.

## Petrol in Germany.

Owing mainly to the greatly increased price of motor spirit in Germany, the Berlin General Omnibus Co. lost £39,380 during the past year's working.

## Starting Difficulties.

We still receive too many complaints from our readers that their machines are too hard to start. Both the manufacturers of complete motor cycles and also those of carburettors should give this matter more earnest attention.

## Common Spirit.

We recently had to fill the tank of the  $3\frac{1}{2}$  h.p. combination we were driving with a brand of petrol such as is being used in lorries and motor omnibuses, for which we were charged 2s. per gallon. It did not appear to render the engine any more difficult to start, and gave ample power.

## Eastertide Competitions.

There were but two motor cycle events of importance this holiday, and both are described and illustrated in this issue. When the competitors were not clad in khaki, they were either armleteers or medically unfit for service.

## German Motorist Killed.

Dr. Ludwig Opel, who once upon a time made a motor cycle, but whose name during the last few years had been prominently associated with motor cars, has been killed at Verdun.

## The Launceston-Hobart Record.

One of Erwin Baker's many records made in Australia—the full list was published on page 382 of our last issue—has already been lowered. We refer to Baker's time of 2h. 37m. for the 123 miles between Hobart and Launceston, Tasmania. Latest reports are to the effect that E. Bayles on a Harley-Davidson has since covered this route in 2h. 34m. 50s.

## Australian Ten Miles Record.

J. Booth, the well-known Victorian rider, has, we understand, lowered the Australian ten miles road record to 9m. 42s. His mount was a Dunlop-tyred Indian.

## The State of Our Roads.

We wonder how many more converts we have obtained to our Spring Frame Campaign after sampling the road surface this Easter. A number of riders remarked to us quite seriously what would become of pleasure motoring after the war if road surfaces continued to deteriorate. Motor 'buses, heavy lorries (industrial and military), and steam tractors are, of course, responsible, and the curious part is that these are the vehicles which get off with the smallest taxes.

## Motor Cycle Records at Herne Hill Track.

On Good Friday the Southern Counties Cycling Union held the United Services Sports at Herne Hill track. The programme included a special performance by Harry Martin, in which he beat all records from a mile to five miles on a  $3\frac{1}{2}$  h.p. M.A.G.-engined Matchless motor cycle. His time for the five miles was 6m. 2½s., the previous best being 6m. 59½s.

## Don't Motor for Pleasure.

Under this heading, a London evening newspaper has stated that it would have been cheaper and quicker for Mr. Lloyd George to have returned from his brief holiday at Criccieth by train instead of motor car. It states that petrol alone would have cost £2 6s. 6d. for the journey, whereas the railway fare, first-class, is £1 19s. 8d. Personally, we do not blame the Minister of Munitions for getting the maximum of fresh air in a short respite from his hard work, and the stuffy railway carriage is not likely to attract anyone when there are other means of travel available.

## Daylight Saving.

Several Continental countries having decided to put forward an hour all clocks at 11 p.m. on the 30th inst. and put back an hour at 1 a.m. on October 1st, the question of similar measures being adopted in this country is again being revived. A saving of fuel to provide artificial light is advanced as the main reason. Motorists in general, particularly in view of the harassing regulations concerning lighting at night and the danger of driving at all in some districts, would, we have no doubt, welcome a scheme of daylight saving.

## Well-known Competition Rider Married.

We wish to congratulate Mr. G. T. Gray, 2nd Lieut. R.E., on his marriage to Miss M. Ridley. The ceremony took place at Barnet on Thursday last week, and the happy couple left after the reception for the honeymoon by motor. Among the many telegrams of congratulation received after the ceremony was one from Mr. Gray's former section still serving in France. Mr. G. T. Gray will be remembered by many as an enthusiastic competition rider of Rudge motor cycles, on which he gained much success in many of the important trials of pre-war days. At the outbreak of war he joined the 7th Middlesex Regiment, and served for some time in Gibraltar, later transferring to the R.E. as despatch rider, and seeing active service in France, where he had the distinction of being one of the few who were selected to act as motor cycle escort to H.M. the King during his tour of inspection. He now holds a commission, and is engaged instructing D.R.'s at a training centre in England.



BIRMINGHAM M.C.C. TRIAL. A neat and attractive sidecar attached to E. Kickham's  $3\frac{1}{2}$  h.p. Sunbeam. It has a hood, and a celluloid screen can be fitted if desired.



## TRIAL IN THE PEAK DISTRICT.

Sheffield—Another War Munitions Centre—organises a Trial embracing many noted Six Days Trials Hills.



E. Sales (3½ h.p. Sunbeam sidecar) climbing Cowdale. He was subsequently disqualified through missing the course.

**A** RELIABILITY trial, in aid of our wounded soldiers, took place on Easter Monday in Yorkshire and Derbyshire. The principal award was the Wilkin Trophy. In addition to this, one gold medal, one gold centre medal, and one silver medal were given in each class, and a bronze medal to all competitors who finished the whole course within ten minutes of schedule time irrespective of marks lost *en route*. All these were given by Messrs. G. W. Wilkin and Co.

The trial, which was in the hands of Mr. G. W. Wilkin, of Sheffield, was open to munition workers, armleteers, and badged and Service men. It was originally intended to make the entrance fee 10s. 6d., but this was found to be too high and was reduced to 7s. 6d.—still rather on the high side in our opinion, and this undoubtedly accounted for the meagre entry list.

### The Competitors.

The entries were as follow :

- A. Blake (2¼ Levis sc.)
- W. H. Bray (1.9 Levis)
- H. B. Hindley (2½ Levis)
- E. Sneath (2¼ Levis)
- F. W. Varney (2½ Levis)
- A. Charles (2¼ James)
- Sgt. H. M. Pashley (2½ Connaught)
- H. Crozier (7 Indian)
- A. Marshall (4¼ James sc.)
- L. Wilton (3½ Triumph)
- C. C. Brown (2¼ Douglas)
- W. Jackson (5 Indian sc.)
- J. Blackburn (7.9 Pope sc.)
- A. E. Booth (7.9 Harley-Davidson sc.)
- E. Sales (3½ Sunbeam sc.)
- H. Barnisconie (4 Norton)
- J. Hardacre (4¼ B.S.A. sc.)
- S. Guest (3½ Rudge)
- H. Wood (4 Norton sc.)
- E. Hallat (8 Morgan)

Of these, owing to the inclemency of the weather, only eleven started from Hunter's Bar, Sheffield, at 9.30 a.m.,

and they cannot be said to have had a very enjoyable time, for they were faced by wind and driving rain from first to last, and oilskins were the order of the day. This must have been very disappointing, in view of the fine scenery traversed, which could not be appreciated on such a day.

The conditions were not very arduous. Competitors were timed by their own watches, and were allowed ten minutes early or late without losing marks. Passenger machines were obliged to carry a passenger throughout, and the combined weight of passenger and driver had to exceed 18 stone. There was a stop of one and a half hours for lunch at Buxton.

### The Route Traversed.

The route included the following places: Jenkin Hill, Gladstone Road, Dairy Lane, Lodge Lane, Wyoming Brook, Stannington, Dungworth, Lower and Higher Bradfield, Strines, Lady Bower Inn, Bamford, Hathersage, Grindleford, Sir William Hill, Eyam, Foolow, Bradwell, Castleton, Mam Tor, Sparrow Pit, Buxton, Cowdale, Kings-terndale, Millers Dale, Tideswell, Litton Village, Cressbrook, Monsal Dale, Monsal Head, Bakewell, Rowsley, Rowsley Toll Bar, Beeley, Chatsworth Park, Baslow Bridge, Froggatt Edge, Fox House, Dore Moor, and finish at Hunter's Bar.

In spite of the wet some of the performances were very commendable, and hills which caused many failures in the last A.C.U. Trials were ascended with comparative ease. For instance, there

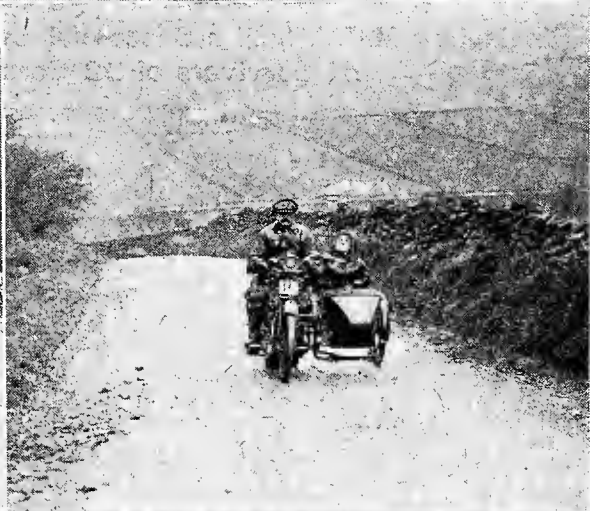


ONE OF MANY WELL-KNOWN HILLS INCLUDED IN THE COURSE.

H. Wood (4 h.p. Norton sidecar) at the top of Sir William.



A. Charles (2 1/4 h.p. James) on Mam Tor.



J. Hardacre (4 h.p. B.S.A. sidecar) coming up Lodge Lane.

was only one failure on Sir William, but it is only fair to state that the stones which previously proved such a stumbling block were gone. Cowdale, a steep winding ascent between Buxton and Bakewell, every competitor succeeded in climbing.

Sgt. H. M. Pashley (formerly of Sheffield, now D.R. with the Canadians) was using O.H.M.S. number plates. The police at a check in the village of Baslow took exception to these, and caused the rider some considerable delay in gleaning information for their report.

#### Striking Performance of Two-strokes.

One of the features of the trial was the excellent climbing ability shown by

the two-stroke machines, which proved to be the winners of each class. The Levis and Connaught machines shared the honours, the first-named mount, driven by Blake, actually taking a sidecar round the whole of the difficult course. A. E. Booth (Harley-Davidson sc.) unfortunately charged the bank of Lodge Lane, owing to his low gear stripping.

Sawdust was used to mark the course at all the difficult corners, but much of this was removed by the wind and obliterated by the rain. This proved to be the undoing of A. Marshall (James sc.), who had been running with the greatest regularity up to Rowsley Toll Bar, where he missed the turn and lost his position, having to be content with

third place. In fact, the absence of a guiding mark caused all the competitors but three to leave the route at this point. As may be imagined, spectators were not numerous owing to the rain, though a few assembled here and there to applaud the more notable performers.

#### Results.

The provisional results are as follow :

##### SIDECAR CLASS.

1. A. Blake (2 3/4 Levis sc.), Wilkin Trophy and gold medal.
2. H. Wood (4 Norton sc.), gold-centre medal.
3. A. Marshall (4 1/4 James sc.), silver medal.

##### SOLO CLASS.

1. Sgt. H. M. Pashley (2 1/2 Connaught), gold medal.
2. A. Charles (2 1/4 James), gold-centre medal.



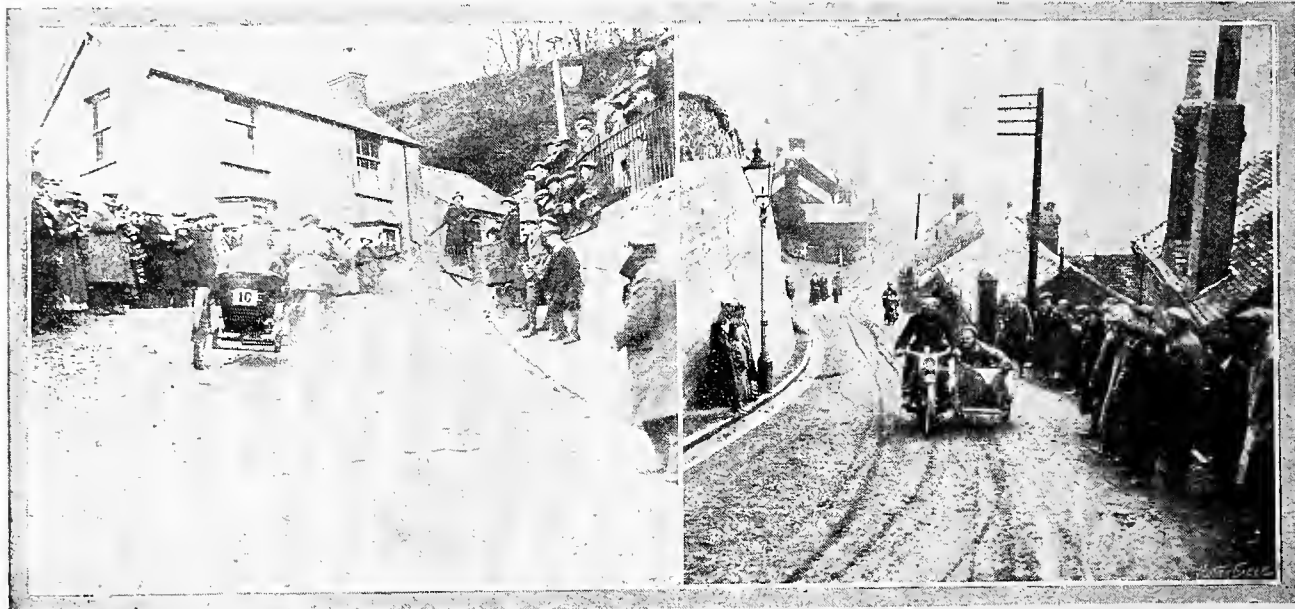
#### THE TWO WINNERS.

Sgt. H. M. Pashley (2 1/2 h.p. Connaught) first in the solo class.

A. Blake (2 3/4 h.p. Levis sidecar) first in the sidecar class.

## MIDLAND EASTER TRIAL.

Birmingham M.C.C. hold a Successful Event mainly for Service Men and War Workers.  
41 Survivors of 52 Competitors over 146 Miles Course.



### LOOKING UP AND DOWN THE OLD WYCHE CUTTING.

A. Mariani (7 h.p. Powerplus Indian sidecar) making a good ascent.

W. Cooper (7-9 h.p. Harley-Davidson sidecar) nearing the top.

**A**NY competitive event in these days admitting "slackers" would not be tolerated. Thus the Birmingham Motor Cycle Club's annual Easter Monday reliability trial was confined to ladies, Service men, Reserve men, munition workers, and all other war workers, but there were no openings for single men eligible for service. We have no doubt that the organisation of an isolated competition such as this for the genuine workers forms a very welcome respite. It provides something to look forward to, and may fairly be characterised as recreative motoring as opposed to joy riding pure and simple.

At the starting point at Griffin's Hill, Selly Oak, on Monday, one was cheered to note the proportion of khaki-clad competitors, whilst navy blue was not entirely absent. There was the same old starting point for Birmingham club trials, the same old faces of officials, the same starter—what trial could be complete without Alec Ross lining up the men?—but frequently the riders were attired in new guise. Altogether the event provided a happy re-union amid general expressions of hopes that the glorious competition days may soon return.

More than one entrant had tales of woe to relate before the time of the start. Cpl. E. Gray had been granted special leave for this event, but had had the misfortune to break the forks of his Zenith on the way to Birmingham. Another competitor could not find the garage proprietor until a few minutes before starting time, and then, when he finally got his machine, found only

one cylinder firing, so reluctantly withdrew.

Practically all the fifty-eight entrants were sent off at minute intervals from 9 a.m. over the 146 miles course, which, though devoid of "freak" climbs, was sufficiently sporting to promise much weeding before the competitors arrived back in Birmingham.

### An Unpromising Start.

It was drizzling with rain as the riders moved off toward Beacon Hill in the face of a gusty wind blowing from the south-west. The first two or three miles toward Bromsgrove over road surfaces "waved" by motor 'buses were not exactly pleasant. We passed E. R. Troward doing something to his machine—he had complained of a fractured petrol pipe at the start—and later Sec.-Lt. H. R. Davies busy with his back tyre. But eight miles from the start, Beacon Hill accounted for several men, though the gradient was nothing to what was to follow. Edwards (4½ h.p. James sc.), Cpl. Johnson (Norton sc.), and the Rev. J. M. Phillpott (3 h.p. Enfield) were among those who came to a standstill, the ruts and grease troubling them. We then passed Bromsgrove and Worcester with its slippery tramlines, and entered upon the second non-stop section, this naturally embracing the Old Wyche at Malvern. Here several hundred spectators had congregated as usual, and were quick to show their appreciation—or otherwise—of a good or bad performance. It had stopped raining now, and the surface of the hill being in excellent order, the performances, generally speaking, were very good.

### Old Wyche Cutting.

The following are notes on some of the performances:

T. B. Haddock (2½ Diamond), very good.

Rex Mundy (3½ Sunbeam), a steady and good climb.

A. Mariani (7 Indian sc.), quite good.

E. Kibble (4 Triumph), very fast and steady.

Sec.-Lt. Davies (3½ Sunbeam sc.), engine seemed to be very hot and was missing; stopped near top.

G. Kuhn (2½ Levis), very neat climb.

W. Cooper (7 Harley-Davidson), seemed to have rather too high a gear; amused spectators by bouncing in saddle, apparently to prevent wheel slip.

J. R. Alexander (7 Indian sc.), very good climb.

E. Frassetto (7 Indian sc.), probably the fastest climb of the day.

Miss Hough (8 Morgan), excellent climb.

Rev. J. W. Phillpott (3 Enfield), failed on lower stretches.

E. Kickham (3½ Sunbeam sc.) caused a little excitement by having a race on the lower stretches of the hill with D. Moss, on an 8 h.p. Moss-Jap, Kickham eventually getting a lead, and reaching the top corner well in front, having made a very good climb.

N. Brown (7 Indian sc.), very good.

G. F. Ammon (2½ Tyler) ran alongside.

W. Barr (3 Enfield) ran alongside.

D. Alan Poole (4 Norton sc.) stopped within few yards of top.

H. J. Stretton Ward (3½ Rudge), very good climb.

L. Clarke (4½ James sc.) stopped near crest, was pushed, and restarted.



**Midland Easter Trial.—**

G. Bell (7 Harley-Davidson sc.), very good climb indeed; fast and silent.

H. Riddell (3½ Sunbeam sc.), steady climb.

F. J. Cooper (6 Enfield sc.) failed near summit; could not hold machine; let it run back, scattering spectators; eventually came to rest against the wall. This accident was lucky in a way, as there would have been no room for Lt. Messervy (8 Morgan runabout) to pass otherwise. As it was the officer was able to make an excellent ascent.

Lt. H. Naylor (6 A.J.S. sc.) made fast climb, as did also P. G. Tomkins (2½ Douglas).

W. H. Broadfoot (4½ James) stopped but restarted without passenger.

C. Percival (4 Douglas) steady climb.

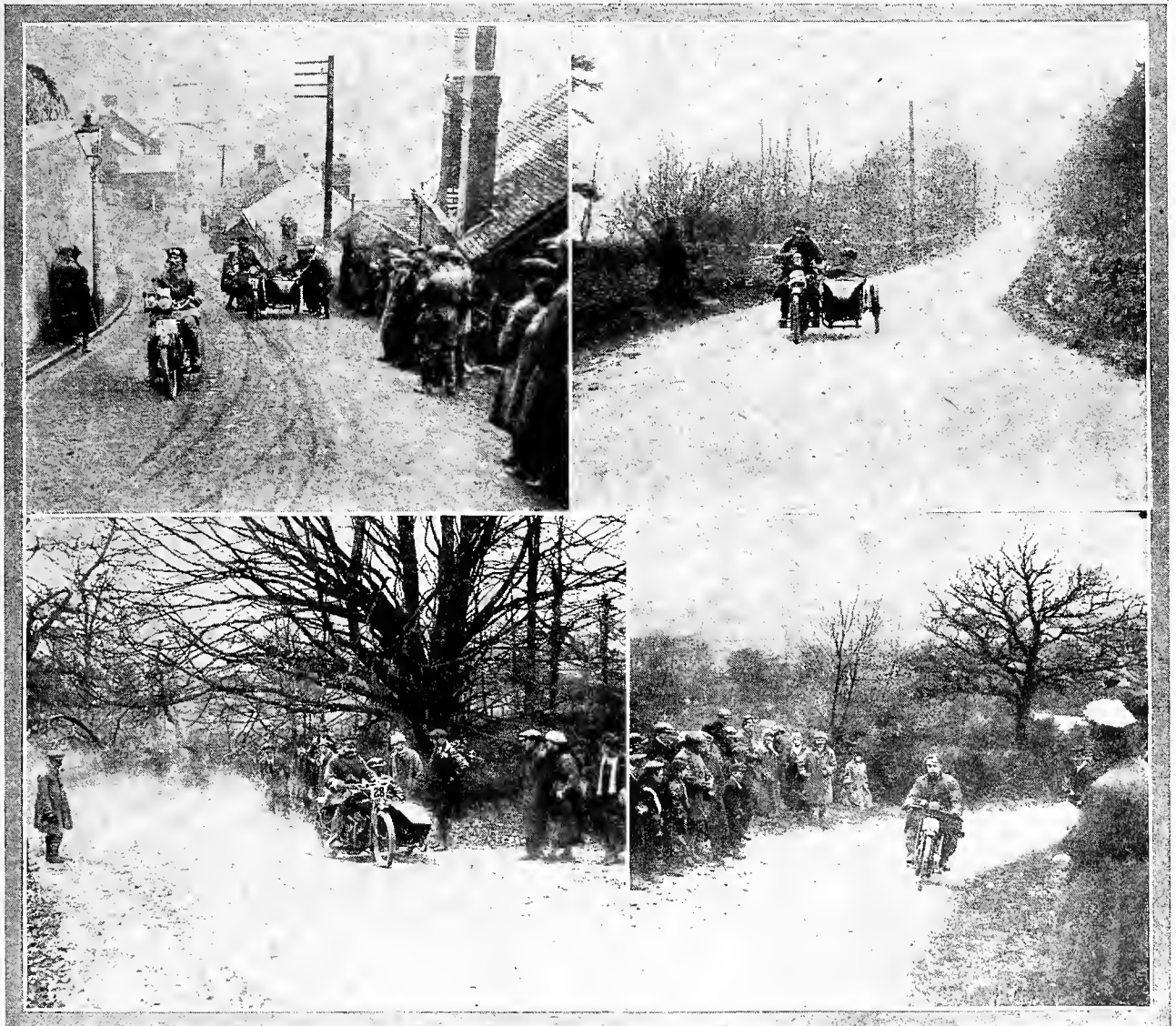
A. Birch (4 Douglas sc.) fast and silent.

After the Wyche the riders were directed via the British Camp Hotel, having an opportunity of enjoying the magnificent panoramas of the Malvern hills. Dropping back again to the Worcestershire side, the competitors wended their way to within half a mile of Upton-on-Severn, or Severn-on-Upton as a wag put it, bearing in mind the recent floods, and then turned to the right for Gloucester. The roads now being dry and hard, the men had no difficulty in keeping to the 20 m.p.h. schedule, for frequently we passed groups chatting and smoking. Through Upton St. Leonards, Portway Hill (65½ miles),

the next test, was encountered. The roads hereabouts were wet again, and on the hill itself there was a thick covering of grease, which proved more than one competitor's undoing. The gradient in any case is very deceptive. The two fastest climbs were apparently accomplished by Stretton Ward (Rudge) and Coates (8 h.p. Enfield sc.), though Frassetto (Powerplus Indian sc.), with Miss Lottie Berend as passenger, made a wonderful climb, as he did on every test hill we observed.

Birdlip was the last ascent before lunch, and then descending Leckhampton, the riders entered the spacious yard of the Plough Hotel, Cheltenham, where Mr. F. W. Corbett—the A.J.S. expert—had got everything in readiness as

**SNAPS ON SOME OF THE TEST HILLS IN THE BIRMINGHAM M.C.C. SERVICE AND MUNITION WORKERS' TRIAL.**



Two Sunbeam riders on the Wyche Cutting. The solo rider, A. J. Young, got on better than Sec.-Lt. H. R. Davies.

Staff-Sgt. N. H. Brown making a good ascent of Portway on his Powerplus Indian sidecar.

H. Riddell, Sub-Lt. R.N.V.R., driving his 3½ h.p. Sunbeam sidecar up Birdlip.

T. H. Haddock (2½ h.p. Diamond) approaching one of the gulleys on Rising Sun.



SCENES ON PORTWAY, WHERE THERE WERE SOME FAILURES OWING TO THE SLIPPERY SURFACE.



T. Stevens (4½ h.p. James sidecar) being passed by Pte. C. H. Poole (5 h.p. Indian).



C. Naylor (4 h.p. A.J.S. sidecar).

usual. Here we learned that Davies's stop on the Old Wyche was primarily due to a puncture, which caused him to speed up to make up time, and he commenced the climb with a red-hot engine. Two competitors ran out of petrol on Birdlip—Rose (4½ h.p. B.S.A. sc.) and Coates (8 h.p. Sunbeam sc.). The last-named had two spare tins of spirit strapped to his carrier. Barr (3 h.p. Enfield) suffered from wheel slip in making the climb, and he was not the only one. The burly Haddocks, astride a little two-stroke Diamond, went up comfortably, as is his wont. The 4 h.p. Sunbeam sidecar driven by J. E. Greenwood, the Sunbeam designer, showed up conspicuously, as also did Cooper (Harley-Davidson) and J. R. Alexander (Indian sc.). Two Grand Prix Morgans, one driven by Miss Hough being two years old, and the other handled by Lt. H. T. Messervy, made sure ascents. The last-named competitor will be recognised by many readers as late of Duo Cars. Unhappily, since his last appearance in competition he has had his right foot amputated, after being wounded at the Dardanelles by machine gun fire. He handled his Morgan throughout very dexterously. We noticed that it had a water heated induction pipe, and the owner assured us that it had reduced his consumption to nearly 70 m.p.g.

#### The Afternoon Run.

There was quite a crowd to see the competitors restart, motor cyclists predominating. Those who are acquainted with Midland trials will hardly need telling that Rising Sun or Gambles Lane was the first test after lunch. There was the usual crop of failures, intermingled with star ascents, which show up skill in tuning, handling the machine, and selection of gear ratios. Again a crowd took the greatest interest in the proceedings, and appeared thoroughly to enjoy the fare.

#### Rising Sun.

The surface of this hill was in very fair condition, and, with the exception of some nasty ruts at the top, which made

going unpleasant and accounted for one fall, the hill generally was in quite good order. What failures occurred were undoubtedly either due to hot engines or lack of power. The first up was A. J. Dowler (3½ h.p. Sunbeam).

Sgt. A. Milner, who will be remembered by many as a very clever trick rider, amused everyone by bouncing his front wheel high off the ground. His little Levis had no difficulty in climbing the hill.

J. E. Rose (4½ h.p. B.S.A.) came up fast with front stand down, and when within a few yards of the top the stand apparently caught a rut, and caused him to fall.

E. Kibble (4 h.p. Triumph) made a really excellent climb.

A. Mariani (7 h.p. Indian sc.) was steady, but slow compared with the other Indians.

B. W. Harcourt (8 Rex-Jap) failed, and after spending some time making adjustments, eventually was able to restart with assistance and reach the top.

W. Cooper (Harley-Davidson sc.) came to a standstill just below the steepest part, but by slipping his clutch he reached the top in a succession of jerks, being assisted by the onlookers. This was hard luck, as he had an otherwise perfectly clean sheet.

Miss Hough (G.P. Morgan) showed great skill in driving, for when at the steepest part she was balked by a sidecar and had to thread her way through spectators at the side of the road.

E. Frassetto (Indian sc.) again made star ascent. Miss Berend, his passenger, was the only one we noticed to lean in the proper direction on the bend.

G. Bell (Harley-Davidson sc.) made splendid climb.

G. H. Ratcliffe (Norton sc.) and J. E. Greenwood (3½ Sunbeam) came up close together, and as L. Clarke stopped near the top they had rather a difficult time; however, both made clean ascents.

Lt. R. T. Messervy (G.P. Morgan) was fast, and swerved about considerably.

J. N. Hill (6 Bat) was very fast, but

throttled down for hump at top, and was unable to pick up again.

From the summit of Cleeve, Winchcombe was reached, the riders branching off down the inconspicuous alley which leads past Sudeley Castle to the hill of that name. J. E. Rose (4½ h.p. B.S.A.), after suffering a fall on Rising Sun on the loose stones, made amends by climbing Sudeley in excellent style. J. R. Alexander went up at a rare bat on his Powerplus sidecar, the deep ruts not seeming to worry him after his training among the Scottish hills. Miss Hough again drove her Morgan with great skill; this lady seems at home on any kind of motor vehicle—motor bicycle, sidecar, runabout, or car. The Harley-Davidson, driven by W. Cooper, went up the 1 in 6 section as if it were level road. Closely following was G. Kuhn (2½ h.p. Levis), whose pace was noteworthy. Noel Brown's Indian sidecar was satisfied with middle gear till within sight of the crest of the hill. T. Stevens made a good climb on his old James outfit, which we must have seen on Sudeley at least a dozen times in competition. Poole (Indian), Choldcrop (Sunbeam), and Ammon (Tyler) came up in a bunch, whilst Kickham's Sunbeam, which had a very attractive disc wheel torpedo sidecar, emitted a most healthy bark, and there was no mistaking the pace. Poole (4 h.p. Norton sc.) had power in hand. Barr (3 h.p. Enfield) and Thompson (4 h.p. Douglas sc.) came up abreast at a good pace. Perhaps Harcourt's Rex-Jap was the quietest machine of the batch, though the A.J.S. sidecars, particularly Naylor's, were noticeable in this respect. Again Frassetto showed the simplicity of hill-climbing on a well tuned Powerplus.

#### A Coincidence.

A curious incident was twice repeated under our very eyes. R. S. Coates (8 h.p. Sunbeam sc.), whilst travelling splendidly, suddenly dried up. Before the momentum of the machine had subsided, one cylinder chipped in, the competitor touched the ground with his foot, though this could not have helped matters, and away the engine went



The only lady competitor climbing Rising Sun or Gambles Lane. Miss Hough (8 h.p. Morgan) passing a less fortunate competitor near the top.

again. A few minutes later his namesake, T. Coates (8 h.p. Enfield sc.), had reached the same spot "all out" on top gear when apparently his float chamber ran dry. The driver saved himself by changing quickly and dexterous manipulation of the clutch. A two-stroke Connaught ridden by Pte. C. Taylor made a very neat and quiet ascent. Bell's Harley-Davidson sc. "roared up," to use a term beloved of motor cyclists. The Rudge-Multi ridden by Stretton Ward again shot up the test hill, though we noticed his head lamp had been shaken to pieces by the rough roads. Greenwood's Sunbeam, like all the others of this make, showed up conspicuously, but we award the palm to this rider as his mount was the most silent.

Ratcliffe's Norton sidecar was very fast, but the bark—it was ear splitting with the throttle open! Tomkins (2½ Douglas) sped past Naylor's A.J.S. sidecar on the steepest pitch, though the last named was obviously content to maintain his own pace. They were followed by Sub-Lt. Riddell, R.N.V.R., on another 3½ h.p. Sunbeam sidecar, and Lt. Messervy on the G.P. Morgan. A few minutes later Hill's 5-6 h.p. Bat-Jap swept up the hill without the slightest effort. C. Percival drove his Douglas up at the comfortable speed one would expect of a man over military age. The performance was none the less impressive to the observant, however.

### The Result of Large Jets.

During the hill-climbing tests one could not help but notice the misfiring on several machines, due apparently to the use of a very large jet. Sinister (4½ B.S.A. sidecar) went spluttering nearly all the way up Sudeley. Altogether forty-four competitors of the original fifty-two starters passed us on Sudeley Hill.

Thereafter the run home was *via* Fish Hill, Broadway, which troubled nobody, to Mickleton, where there was a time

check to Stratford, Warwick, Kenilworth, and Stonebridge. At the time checks, by the way, one or two competitors had cut things so fine that they literally dashed up to the officials and almost threw their watch cases, narrowly avoiding collisions with machines in the roadway.

The finish was at Hodge Hill Common, and competitors generally voted the event a very successful one and excellently arranged. A few competitors ran off the course, but this is perhaps inevitable on such a long and intricate route.

### Provisional Results.

#### GOLD MEDALS.

A. J. Dawler (3½ Sunbeam)  
A. Milner (2½ Lewis)  
T. B. Haddock (2½ Diamond)  
Rex Mundy (3½ Sunbeam)  
A. Mariani (7 Indian sc.)  
E. W. Choldcroft (3½ Sunbeam)  
J. R. Alexander (7 Indian sc.)  
Noel Brown (7 Indian sc.)  
E. Kickham (5½ Sunbeam sc.)  
T. Stevens (4½ James sc.)  
Pte. C. H. Poole (5 Indian)  
Sgt. C. B. Thompson (4 Douglas sc.)  
C. Naylor (4 A.J.S. sc.)  
E. Frassetto (7 Indian sc.)  
G. Bell (7 Harley-Davidson sc.)  
H. J. Stretton Ward (3½ Rudge)  
Sub-Lt. H. Riddell (3½ Sunbeam sc.)  
Lt. R. T. Messervy (3 Morgan)  
C. Percival (4 Douglas)  
T. Sinister (4½ B.S.A. sc.)

#### FIRST CLASS CERTIFICATES.

W. Heaton (4 A.J.S. sc.)  
W. Cooper (7 Harley-Davidson sc.)  
J. Dudley (3½ Sunbeam)  
R. S. Coates (8 Sunbeam sc.)  
T. Coates (8 Enfield sc.)  
J. E. Greenwood (3½ Sunbeam sc.)  
Lt. H. Naylor (6 A.J.S. sc.)  
P. G. Tomkins (2½ Douglas)

#### SECOND CLASS CERTIFICATES.

J. E. Rose (4½ B.S.A.), G. Kuhn (2½ Lewis), W. D. Hawkes (2½ Tyler), G. F. Ammon (2½ Tyler), D. Alan Poole (4 Norton sc.), W. Barr (3 Enfield), G. H. Ratcliff (4 Norton sc.), L. Clarke (4½ James sc.), J. N. Hill (5 Bat), and A. Birch (4 Douglas).

#### The following retired:

Sec.-Lt. H. R. Davies (3½ Sunbeam sc.), A. J. Young (6 Sunbeam), Cpl. E. Johnson (Douglas), Rev. G. Phillpott (3 Enfield), C. Moss (8 Moss-Jap sc.), R. Troward (4 Triumph), B. W. Harcourt (8 Rex-Jap sc.), Pte. C. Taylor (2½ Connaught), F. H. Cooper (6 Enfield), W. H. Broadfoot (4½ James), and Wells (—).

## BY THE WAY.

There were a dozen service men competing.

Cpl. J. Drew had his leave cancelled, and had to return without competing.

One competitor was using graphite suspended in oil, and was quite enthusiastic about the success of the mixture. It may be marketed before long.

The five Indians entered all gained gold medals.

Some of the competitors seemed quite annoyed to have been "had" by Portway. It looked so easy, but the coating of grease told its tale.

Another rider was using a patent carburettor of new design—which he carefully wrapped up in flannel, *i.e.*, his overalls—before entering the hotel for lunch. Honesty forbade us peeping behind the scenes, though we knew the secret!

We hardly recognised Haddock when he proffered a handshake. He is now clean shaven, and wittily remarked that there had been a "Hair Raid."

The two members of our staff who covered the trial were mounted on military models—a 4 h.p. Triumph, such as supplied to despatch riders, and a Clyno sidecar outfit largely used by the M.M.G.S. Both behaved in an exemplary manner climbing all hills with ease.

A new Humber "after the war" model was driven round the course by S. Wright. It has a 3½ h.p. horizontally opposed twin engine and three-speed countershaft gear box. With a weighted sidecar Sam Wright could develop a surprising turn of speed, and we saw him make very neat climbs of Rising Sun and Sudeley.

A. E. Kibble (4 h.p. Triumph) ran over a dog in Broadway, which caused him to fall and hurt his foot. He was taken into a house, but was able to proceed after resting awhile. He arrived late at the Mickleton check. This was very hard luck, as up to this he had a perfectly clean sheet, and also finished to time. His case is receiving special consideration in consequence.

Miss Hough finished the course, but "took the wrong turning" after Birdlip, which precluded an award.

The water splash near Sudeley was a surprise for many, although it was noted on the route cards. It caused a considerable amount of trouble. Had it been in a non-stop section it would undoubtedly have been the cause of several lost gold medals.

Much interest was displayed in the performances on the famous test hill, the Old Wyche Cutting. The wall and path at the top, where the gradient is the steepest, were crowded with spectators, notably of the weaker (?) sex.

Most of the competitors made excellent climbs, and failures were few.

# THE TAXATION OF MOTOR CYCLES.

Possibility of Owners laying their Machines Aside. A Hint that the Treasury may place the Taxes on a Fairer Basis.

CONSIDERABLE numbers of letters continue to reach us on the taxation question, and on this subject the adage "*quot homines tot sententiae*" no longer holds good, for there is remarkable unanimity of opinion that, under the proposed scheme, motor cyclists are being very unfairly treated. This, as our readers know, we have maintained from the first, and for the following reasons:

1. The R.A.C. or Treasury rating gives no fair comparison of the horse-power of different motor cycles.
2. This rating is still more unfair when comparing motor cycles over 4 h.p. with cars of like horse-power, e.g., a certain 1,000 c.c. car is rated at 6½ h.p., tax £4 4s.; while a certain 500 c.c. motor cycle is rated at 6½ h.p., tax £4 14s. 6d.
3. The Treasury rating is unknown in the motor cycle world, as machines are known by their nominal makers' rating and their capacity.
4. The tax on cars under 16 h.p. is doubled, while the tax on motor cycles, none of which exceed that horse-power, is increased in many cases to nearly five times as much, and is in all cases more than doubled.
5. No difference is made between a sidecar outfit carrying two passengers and a solo mount.
6. No allowance is made in the case of old machines of low value, where it is possible that the tax may amount to nearly half the value of the machine.

But in making representations to the Chancellor, it was necessary to bear in mind that no recommendation was likely to be adopted *which materially decreased the amount of revenue which the Treasury expected to obtain.* Readers who think our suggestion too high should remember this.

We look with no favour upon the scheme put forward by a contemporary which proposes to increase the tax on lightweight motor cycles (i.e., to make the minimum tax on motor cycles £2 10s.), and take it off Auto-wheels. This is, as one of the correspondents puts it, "robbing Peter to pay Paul," and we should like to see the R.A.C. rating altogether discarded as far as motor cycles are concerned, for it is entirely unsuitable, and consequently unfair.

Many of our readers have informed us that the proposed increase of tax will compel them to lay up or part with their mounts. It is not that they are unpatriotic, but the extra tax combined with the increased duty on, and price of, petrol makes it simply impossible.

## Readers' Opinions.

Sir,—There is one marvellous anomaly in the proposed motor cycle taxes, and it is this: For £1 we are allowed to motor from January 1st to August 15th, but for a period three months shorter—April 1st to August 15th—we are to be charged very much more—in my own case nearly five times as much. We were told not to motor for pleasure (health, I call it), accordingly I adopted the Premier's motto, "Wait and see." Result—I have, like many others, been made an "April fool." Why penalise a man for doing what he was told? If we were not to motor, why take out a licence? The £5 or £6 which *would* have gone to the Treasury for my £1 licence and petrol taxes have gone in buying a push bicycle, and I shall have saved another £10 or £12 to pay my income tax. O 346.

Sir,—You appear to assume that all riders will be able to meet a demand for £4 4s. for a big twin, but I have every confidence in stating that there is a majority to whom this will be quite impossible. I refer to the man who has to work for his living, earns an income ranging from £150 to £300 a year, and, I consider, forms the backbone of the body of present-day motor cyclists.

I consider that the maximum taxation a motor cycle can bear is £2 for engines over 500 c.c. and £1 for those below. I suggest that all motor cyclists who can do so should cease to use their machines.

## RIDER OF A BIG TWIN.

Sir,—In regard to the new motor taxation, what would be the tax payable on a 3½ h.p. Douglas? I see from a contemporary that there is some possibility of a revision of

the taxes; but the suggested revision would, if R.A.C. rating be persisted in, operate still more unfairly in the case of the 3½ h.p. Douglas. As at present the tax would be (I suppose) £3 3s., under the revision £4 14s. 6d.—quite ridiculous for a 494 c.c. machine. E. G. SWANN.

[The 3½ h.p. Douglas has a bore of 68 mm., and would be rated at 5.6 h.p. by the R.A.C. formula.—Ed.]

Sir,—In my opinion the most simple and commonsense method of taxation is to double the present tax on all motor cycles, irrespective of h.p., for, after all, the higher-powered machines pay their extra quota on the extra taxed petrol.

Any scheme that compels owners of such motor cycles as the Scott, for instance, to pay £4 14s. 6d. will defeat its own object, and whether Mr. Loughborough's figures of the estimated number of machines at present in use is accurate or not does not matter. What does matter, both to the Treasury and particularly to the trade, is, what will be the number of machines in use after a heavy tax is imposed. A large proportion of motor cyclists are working men of limited means, who manage "by foregoing other pleasures" to buy an old machine. But they are essential to the trade, for few buy new machines unless they can find customers for their old ones. And I maintain that any severe tax will take "the user up" from the ranks of motorists, and both the Treasury and the trade will be worse off for it.

HOLDSWORTH HARDY.

Sir,—As a member of the motor cycling public, kindly allow me to thank you for your letter to the Chancellor of the Exchequer on our behalf. If your excellent suggestions are disregarded, then my machine—and many others—is for sale or storage.

Kindly permit me to put in a plea on behalf of owners of Auto-wheels and auxiliaries. It is a great pity that the new tax should prove the death blow of these very interesting attachments, and I feel sure the old tax of £1 is quite sufficient for them, and that it was too much in normal times. WORKING MAN.

Sir,—Will you permit me as a reader of your valuable paper for some five years to air my views on the taxation question?

In the first place, money has to be found, and I think that we can trust the Government to have some fair reason for increasing the tax other than spitefulness.

Then the question is how would be the fairest way to apportion it? The suggestion of one guinea a wheel, made in your paper, at first glance seemed a good solution, but would come rather hard on 3½ h.p. outfits. Might I suggest the following:

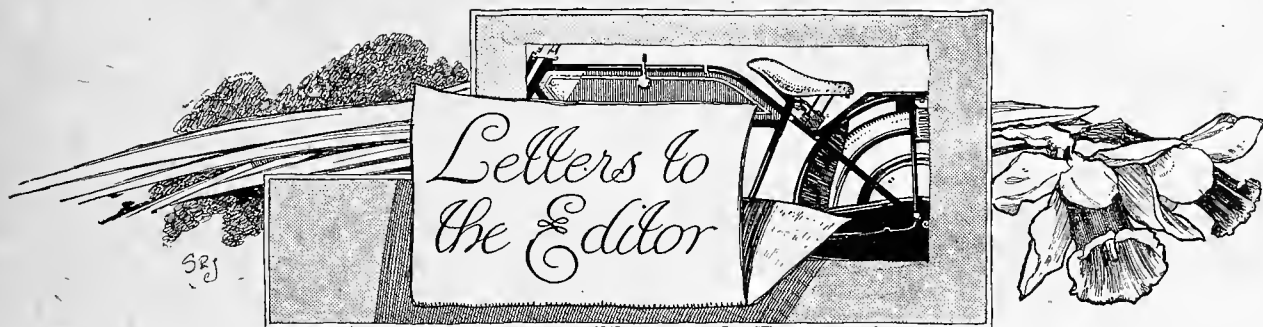
One wheel and cycle attachments up to 1½ h.p.	£1	0	0	
Two wheels up to about 600 c.c. ...	...	2	0	0
Two wheels over 600 c.c. ...	...	2	15	0
Three wheels up to about 600 c.c. ...	...	2	15	0
Three wheels over 600 c.c. ...	...	3	10	0

SCOOTER.

## A.C.U. Secretary's Interview with the Treasury.

The secretary of the Auto Cycle Union has recently had an interview with Sir John Bradbury, the Secretary of the Treasury, with the object of placing before him the injustices motor cyclists would have to suffer through the proposed new method of taxation. Sir John Bradbury listened to Mr. Loughborough's able appeal with extreme sympathy, and while it seems almost too much to hope that the A.C.U.'s proposals, which very nearly agree with our own, would be adopted, there seems to be every likelihood of the matter being settled in a manner which would cause the taxation of motor cyclists to be placed upon a fairer basis.

We announced last week that an acknowledgment from the Chancellor of the Exchequer stated that *The Motor Cycle* proposals of taxing motor cycles by their engine capacity (i.e., 10s. 6d. per 125 c.c.) should receive attention.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

### More Air, Less Petrol.

Sir,—I submit a tip for riders of Harley-Davidson machines. On the bottom of the induction pipe I found a boss, which is most convenient for fitting a small tap; the ordinary standard compression tap will do quite well. With this simple fitment it will be found that the machine runs cooler, and also less petrol is consumed. I myself have got 60 m.p.g. and over with a sidecar fitted. It is useful for fast work, as the engine can get the maximum amount of air.

B.F.J.J.

### Derby Groups and the M.T., A.S.C.

Sir,—“Subaltern” is doubtless rather tired of the sort of chat written by “Group 40,” but he cannot be nearly so tired as we are of outbursts like his. By we, I mean men who enlisted in the M.T., A.S.C., before most people realised there was a war on.

I do not propose to argue at length about the rate of pay, but I wonder what “Subaltern” would have done if it was vital to have motor drivers, as it was in the early days of the war, when the M.T. saved the situation more than once during the great retreat, and during the greater advance. Would he have offered eight shillings a week to skilled men, who, in many cases, were earning eight and ten times that amount?

Can he cite a case in civilian or military life, since the world began, of where the worst job has been the best paid, and why is the M.T. chosen as the best job?

If men are to be paid according to the amount of risk run, then those who are employed at the War Office should receive nothing, or perhaps ten shillings every time there is an air raid.

The natural reply is that the men at the War Office are paid according to their responsibilities, and there is the whole point.

Would it be right to pay a man who is entrusted with £800 to £1,000 worth of machinery at the same rate as a man responsible for nothing?

I, as a commander of the repair shops, have an easier time than one of the fitters, therefore I should receive less pay than the latter.

“Subaltern” remarks that the war is not going to be won by men driving motors. True. Nor is it going to be won by the men sitting and fighting in trenches without the aid of the men who drive the motors. Can he have overlooked the wonderful work of the French M.T. at Verdun?

No one is more willing to recognise the hardships of the men in the trenches than the men of the M.T., who are genuine sympathisers, but they do think it unfair that their valuable work at the commencement of the war should be quickly forgotten. They are ready to do it again, and willingly too, although a lot of people delight in thinking them slackers.

I only wish “Subaltern” had been my “mate” on the three ton lorry I drove in the early days, and then he would have learnt enough to have made him hesitate before writing as he did.

Regarding the Group question, your correspondent, “Ex-South African Volunteer,” explains it so well that any attempt on my part would be akin “to painting the lily.”

ANOTHER SUBALTERN.

Sir,—I do not agree with “Anglo-Indian’s” remarks regarding the 6s. per day men of the M.T., A.S.C. Is “Anglo-Indian” aware that men who joined shortly after the outbreak of war received 6s. per day, not for the risk they ran (which is nearly nil), but for their services as motor drivers of three years’ experience? Why is there such ill-feeling by the Derby group men against the 6s. a day M.T. driver? Surely they could have obtained it if they had enlisted at the proper time, as many could have done who are now under Lord Derby’s group system, many for the M.T., A.S.C. But, alas, they are too late for the much-coveted 6s. a day, so I suppose that this is the cause.

SIX BOB A DAY.

### Aluminium Pistons for Two-strokes.

Sir,—Permit us to support Dr. A. M. Low’s letter *re* the above, in which he says that the greatest care is necessary to ensure that the exact composition of the aluminium is known when purchased. Very few alloys are really suitable for this severe service, and we believe that we have in Magnalite, made by the Walker M. Levett Co., of New York, whom we represent, the best material for this purpose without exception. Anyway, we have opinions to this effect, after extensive trial of this and other materials, from the Brotherhood Co., of Peterborough, and the Sunbeam Co., of Wolverhampton, and the physical properties possessed by this alloy are given as the result of tests made by Dr. C. F. McKenna, of New York, and confirmed by tests made by the Westinghouse Electric and Manufacturing Co., of Pittsburg, and by the H. H. Franklin Manufacturing Co., of Syracuse.

They are as follow:

	Magnalite.	Cast iron.
Specific gravity ...	2.59	7.218
Weight per cu. ft. 161.5 lb.		450.08 lb.
Thermal conductivity ...	92.0	11.9
Tensile strength ...	25,400 lb. per sq. in.	16,500 lb. per sq. in.
Coefficient of expansion ...	.0000225	.0000056
Elastic limit ...	15,800	—
Compression strength ...	128,000	90,000

If, therefore, an absolutely reliable piston material is required it will be found in Magnalite.

With regard to the Shaw motor attachment, as we have had numerous enquiries from your readers for it, we are afraid that, unless individual purchasers can show that the outfit is intended to be used for other than “pleasure purposes,” we cannot obtain permission to import; but we would like to say in regard to the last paragraph in your notice—namely, “that an ordinary cycle ridden at 35 m.p.h. without spring forks would not be particularly pleasant”—that, whilst we quite admit this, we submit that a man who buys an attachment such as this for fitting to an ordinary cycle would do so not with the idea necessarily of going fast, but of being able to travel at a little beyond the maximum pedalling without effort on his part, and to be able to surmount hills readily, and the Shaw attachment enables him to accomplish the former, running on half throttle, or less, and has ample reserve of power to take any hill at a good speed by opening out the engine.

BRAMCO., LTD.,

F. M. WHATELEY.



### A Board of Selection.

Sir,—I feel inclined to question Cpl. Shaw's statement that this tethering of the front fork spring allows the spring full play. The fork in question absorbs horizontal wheel shocks most efficiently. Unfortunately, horizontal shocks are not the most important enemies the front forks of a motor bicycle have to absorb. A board of selection has been a crying necessity. Machines of several makes are being sent out that would never be passed. Only the other day I scrutinised a batch of new mounts. The detail work, necessary detail work, was shocking. The brakes fitted to a machine on which possibly a man's life depended would have been a disgrace on a child's toy tricycle.

"When the boys come home" there will be a story to tell, and some people's ears will tingle, and very probably their bank account will show a curious leakage. They have asked for it.

ALEX. LINDSAY,

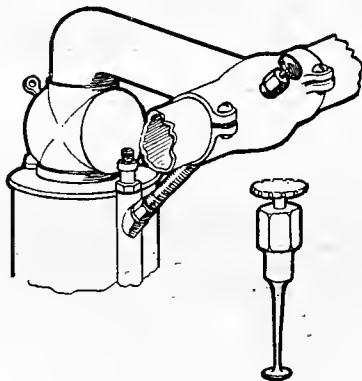
(H.S. Cambria.)

Capt., R.A.M.C.

### A Small Fitting for Indians.

Sir,—The enclosed is a sketch of a pilot throttle valve for fitting to Indian motor cycles. The object of the fitting is to regulate the supply of mixture passed to the engine *via* the pilot jet. In starting an Indian motor cycle fitted with one of these pilot throttle valves, the milled screw is given one or two turns in order to open the valve, the main throttle being closed, of course. The engine is then started up in the usual way, and will be found to run quite slowly at first. As the engine becomes warm, however, it will be found that it commences to "race" unnecessarily.

By screwing down the pilot valve the engine can be throttled down to a mere "tick over." The advantages of this fitting are obvious: (1) Less petrol consumed; (2) slow running, enabling one to crawl along with the standard gear ratios; (3) less noise; and (4) a better braking effect when the main throttle is shut. The valve will be made in two sizes, suitable for the 5 h.p. and 7 h.p. model Indians. It is very easily fitted, simply being soldered into the induction pipe. This fitting is fully protected, and will be put on the market very shortly.



Suggestion for throttling pilot jet on Indian. See letter on this page from Malcolm Brechin.

MALCOLM BRECHIN.

### Two-stroke Design.

Sir,—As the two-stroke motor cycle engine still seems to attract a great deal of interest, may an amateur be allowed to give his views founded on two years' riding experience?

(1.) Port Design. It is frequently stated in your columns that the efficiency of these engines depends largely on correct port design, but I have never seen any mention of what is correct port design. Now, I believe, the ports are always made rectangular, and, no doubt, this shape gives the largest possible opening without making them too deep in a vertical direction, and they must be kept narrow in this direction so that they can be rapidly covered and uncovered by the rise and fall of the piston. When decarbonising an engine the corners of the exhaust port are invariably found to be filled up with deposit, making the opening oval, and it has occurred to me that the ports might, with advantage, be made oval in the first place, not only to prevent this deposit, but because these corners obviously cause a "back-water" which must hinder the rapid flow of the gases. In practice also the engine runs better when slightly carbonised, which, I think, is due to the rounding off of these worse-than-useless corners. The ports would be further improved by having their edges bevelled off instead of being left sharp. Possibly some enterprising manufacturer will carry all before him by bringing out an engine with "streamline" ports.

(2.) Position of Ports. The usual arrangement of ports is—exhaust in front, transfer behind, and inlet at the side. In a few engines the inlet port is directly under the exhaust, and this seems to be the ideal position, as the incoming charge gets warmed by the exhaust.

(3.) Spark Timing. The timing given for two-strokes is dead on top with the ignition fully retarded. Earlier timing gives much better results, but variable ignition is a *sine qua non* for slow running and to prevent knocking.

P. W. HAMPTON.

### Four-cylinder Motor Cycles.

Sir,—Those who, like myself, have since the accumulator days ridden every type of motor cycle, single and twin, large and small, two-stroke and four-stroke, and whose opportunities do not confine them to any one mount for a particular period, must have welcomed your recent references to the subject of four-cylinder motor cycles. To express my own views would expand this letter into an article, so I will confine myself to a few comments, prompted by riding experience of a 5 h.p. F.N., which I have altered and improved almost beyond recognition.

It appears to be assumed that a four-cylinder of much less than 1,000 c.c. is a failure because of frictional losses. I cannot agree. It must be remembered that as against any extra frictional loss in a four-cylinder of 500 c.c. as compared with a single of the same capacity one must place the gain of perfect balance in the multi-cylinder. The lack of balance in a single absorbs a great deal of efficiency. This, taken in conjunction with the fact that in the four-cylinder the stroke is much smaller and consequently the frictional area lessened in ratio, would, I think, show a very slight discrepancy of actual power absorbed, were it possible to conduct a reliable bench test of the two types. I believe I am correct in saying that the F.N. Co. produced in 1914 a four-cylinder engine of 498 c.c., which developed 11 h.p. on bench test. The war, of course, put an end to all experiments.

As regards the question of wheelbase, "Ixon" has evidently forgotten the position of the gear box on the 5 h.p. F.N. when he gives the four-cylinder designer the option of elongating the wheelbase by fitting a countershaft gear or of incorporating a hub gear. The hub is the last place on earth to place a gear, but what objection can be taken to its inclusion as part of the shaft drive, as is done on the 5 h.p. F.N. On the 7 h.p. F.N. it occupies the usual conventional position, and that machine undoubtedly is lengthy and essentially a sidecar machine. In this connection, again, the war has prevented the F.N. Co. from keeping abreast, as I believe the chief designer of that company had evolved a 7 h.p. model preserving all the characteristics of the present machine and yet coming out fully 7 in. shorter in the wheelbase. The Henderson Co. contend that an ultra-long wheelbase makes for unusually comfortable riding. From actual experience, I concur in this view, and I was surprised the other day when having occasion to traverse a bumpy stretch of Lancashire pot-holes, firstly on a spring frame machine and afterwards on a four-cylinder rigid mount, I found the long wheelbase of the rigid machine to be a better comfort-giver in actual practice than the spring frame on the short machine. However, convention demands a short wheelbase, and it is but a simple engineering proposition to meet the demand. I might mention that the gear box on the shaft possesses the advantages of a direct drive and a straight pull on the operating mechanism.

There is a tremendous field open to the British manufacturer in the designing of a four-cylinder motor cycle following British ideas. I do not wish to make invidious comparisons between the Henderson and the F.N. Each has its talking points, but neither make is all it might be made by a British manufacturer. Even so, I should not dream of going back to a single or a twin for a permanency. That within a very few years the ideal double-purpose mount will be a 500 c.c. three-speed four-cylinder is the conclusion I have reached after experiments on an old F.N. to which had been attached a temporary arrangement for operating the inlet valves mechanically. I think the results would have astounded those advocates of medium weight singles and twins who talk so glibly of frictional losses, when all the time they are led astray by an induction system that is the greatest blemish on an otherwise beautiful job.

H. E. THOMPSON.

**Top Feed Carburetters.**

Sir,—With reference to the comments made by "Ixion" re top v. bottom feed to the float chamber, to our minds there is no comparison between the two. The only point that we are aware of where the bottom feed float chamber can be said to score is that it is possible to remove the float from the float chamber while it is in position without disturbing the petrol pipe.

Directly against this you have the fact that if the bottom feed float chamber is subject to excessive vibration the cap may work loose and become partly unscrewed. We have an instance on record where this caused a very serious fire. This, of course, is impossible in the case of the top feed, as the float chamber cap is locked permanently into position by means of the petrol pipe. Roughly speaking, the following are the advantages of the top feed v. bottom feed:

**TOP FEED.**

The life of the needle valve is considerably lengthened owing to the absence of the balance weights.

The cap cannot become loose by vibration.

When flooded to start the petrol level in the float chamber is not raised, and the flooding is over immediately the tickler is released.

Elimination of the balance weights with their tendency to jam when unduly worn.

Cannot be assembled wrongly.

Air locks are apt to take place in any float chamber if there are excessive bends in the petrol pipe, or if the petrol pipe is too small in diameter, or if the petrol pipe takes, in any part of its course, a horizontal position.

Dirt coming through the petrol pipe is swept away from the needle seat and falls to the bottom of the float chamber out of the way.

With reference to choking of filter gauzes, this is equal in both types, provided the same gauze is fitted. The riders have the option of removing the gauze, but if the dirt is allowed to come through the carburetter, sooner or later the jet is found to be choked up, and if it only becomes partially choked this generally causes trouble, which an amateur may have difficulty in finding. The real cure for the thing is, of course, to fit a proper filter gauze of ample area between the tap and the carburetter, as invariably new machines have a certain amount of dirt left in the tanks, and it is some considerable time before this is eliminated.

With regard to altering the petrol level with the top feed, this is set once and for all. We may say that many troubles are caused by riders tampering with the needle, which is never necessary. As a matter of fact, the petrol level can be down the jet as much as a quarter of an inch, or even more, without being in the slightest way perceptible under the lightest loads under which it is possible to run the engine. Therefore, the idea which many people have of having to keep the petrol just level with the top of the jet is a fallacy.

**BOTTOM FEED.**

The hammering effect of the balance weights causes undue wear upon the point of the needle where it seats.

The cap sometimes becomes loose, and unscrews by vibration, causing excessive flooding.

When flooded to start the petrol level in the float chamber is raised, and flooding continues until such time as the surplus is drained away.

Wear and tear of the balance weights and pins tends to cause them to lock and flood. This is practically universal if the float chamber has been in wear for any excessive period.

Amateur efforts often bend the balance weights or their pins, consequently causing stiffness in working, and flooding.

The same remarks apply to the bottom feed.

Dirt coming through the seating remains there, as this is the lowest part of the float chamber, and tends to cause flooding.

We may say that with the ordinary sized jet that is fitted to most carburetters capillary action alone will account for quite a quarter of an inch difference in the indicated level of the jet and the true level of the float chamber. That is to say, when the petrol level will show level with the top of the jet, the level in the float chamber is a quarter of an inch lower, this provided the jet has once been wet with petrol.

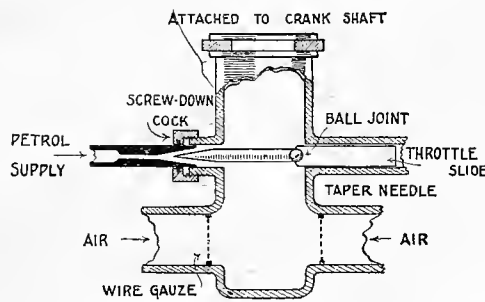
With reference to the liability of the float chamber lid to turn when a spanner is being applied to the petrol union, provided each is tightened up with the same amount of pressure, there is no fear of the float chamber lid coming undone while undoing the petrol union, as the diameter of the thread in one case is approximately 2in., and in the other case is approximately 3in., the frictional resistance of the float chamber lid being far in excess of that of the nut.

BROWN AND BARLOW, LTD.,

C. BROWN, Managing Director.

**Floatless Carburetters.**

Sir,—With regard to the letter on floatless carburetters in your paper of March 23rd, I quite agree with "Old Hand" that it is possible to produce a floatless carburetter suitable for a motor cycle engine. A floatless carburetter named the Blocktube—used largely on the 90 h.p. Le Rhone



(See accompanying letter from G. W. Hepple.)

rotary aero engine—gives satisfactory results. A screwdown cock is required to regulate the flow of petrol, so that the engine will give the maximum number of revs. on full throttle. It is then possible to accelerate or shut down by opening or closing throttle. I enclose with this note a rough sketch.

G. W. HEPPLÉ, CPL., R.F.C.

B.E.F.

**Overheating on Two-strokes.**

Sir,—I think that some of your readers will find the following interesting as regards my 2½ h.p. two-speed Connaught two-stroke.

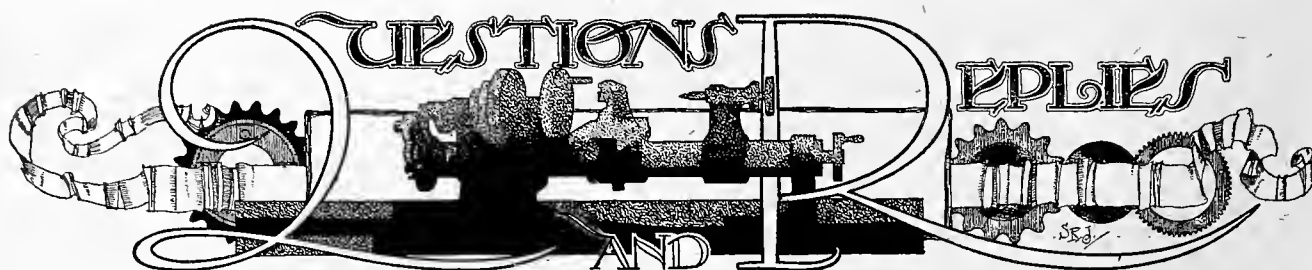
I live in rather a hilly district and where road conditions are very bad indeed. Consequently I rather doubted as to whether my Connaught would be able to face it; but I am astounded at the reserve of power to be found in the engine and the strength of the frame. It is nothing unusual for me to roar up some really big hills on top gear. I have not yet failed on any hill, and have frequently taken a passenger.

The carburetter is an Amac, and I am now using a 24 jet, consequently the consumption is good, averaging from 95-100 m.p.g. on Shell No. 1 when obtainable.

I must say I like the petroil lubrication as far as lubrication itself goes, but it is very messy. I can go for miles on a low gear—9 to 1—with the engine going fairly fast, without, as "Ixion" says, "the thermometers in the whole country going up 10° apiece." I will admit that the Levis lubrication system is ideal, but will G. W. Wilkin state what is his oil consumption? Of course, if he keeps his engine "swimming in oil," as he must do, what can he expect but a cool one? How often does he decarbonise? I decarbonised after 2,000 miles, and found rather a big deposit.

Has any Connaught rider tried paraffin; if so, with what results? My machine has a fair turn of speed, 43 m.p.h. being the fastest.

R 2199.



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy, for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Carburettor Flooding.

**?** Will you please advise me as to what to do with my carburettor (B. and B.), which leaks under the jet when the engine is stationary, but not when it is in motion? I have cleaned it thoroughly, and cannot see that the float sticks.—F.R.H.

The trouble is probably due to the needle valve not seating properly, caused by grit on the seating, to the valve requiring to be ground in, to a bent needle, or to the float being full of petrol owing to a slight leak. The toggle levers being worn or sticking might also cause the petrol level to rise too high.

### Overhead Valves.

**?** When ordering an 8 h.p. engined motor cycle for general use, both solo and with sidecar, what is the disadvantage in specifying overhead valves? The advantages are obvious, namely increased speed and liveliness. Would an overhead valved engine be difficult to start, wear out quickly, refuse to run slowly, be difficult to take down for the purpose of grinding in the valves, or overheat with a sidecar? I should be obliged if you would inform me whether you consider that the advantages of this type of engine outweigh its disadvantages?—E.W.H.

The great disadvantage of overhead valves is the risk of the valve breaking and falling into the cylinder. An engine with overhead valves would not be difficult to start, but the moving parts are likely to wear quickly unless proper means are taken to lubricate them. It would run slowly if there is an absence of air leaks, and the carburettor is adjusted properly. A good many of these engines require the cylinder to be taken off for the valve to be ground in. Such a procedure, while not difficult, entails much unnecessary labour, and occupies double the time required on a side-by-side valve engine. There is no reason why these engines should overheat; in fact, the reverse is what is to be expected. On the whole, we think that an overhead valve engine is not worth using for touring purposes, the side-by-side valve being, generally speaking, superior except in the case of a motor cycle used for speed purposes only.

### Engine Balance.

**?** The vibration of my engine at speeds over twenty miles an hour is excessive, and on taking down the engine I find the counterbalance which is cast on the flywheels is heavy enough to bring the two pistons to the top of the stroke. I have always understood that all the revolving weight and about half the reciprocating weight should be balanced, so that the counterbalance appears to be far too heavy at present. Should I reduce the weight to half the weight of two pistons or half of one?—R.J.B.

It is usual to balance all rotating parts, that is crank pin, big end, and half the connecting rod, while half the weight of the reciprocating parts is allowed. These include small ends, half the connecting rods, and both pistons. We would advise you to obtain the booklet dealing with this subject, price 7d. post free from these offices.

### Running on Paraffin.

**?** I recently noticed that one of your readers stated that he ran on a mixture of 50% petrol and 50% paraffin for sidecar work and found it quite satisfactory. I have a 1913 B. and B. carburettor on a 3½ h.p. motor cycle which I run with a heavy sidecar which is always attached. Do you think that I can use the above mixture without suffering from dirty valves and cylinder, also fouling exhaust extension pipe, which is about 5ft. long? The mean temperature here is about 80°. The fastest time I can do on the machine without passenger is 36 m.p.h. I have a three-speed countershaft gear box, and the weight of the machine, sidecar, and rider is roughly 500 lb. Do you consider this a fair speed for the machine (which is chain-driven) on the level?—W.S.R.H., Sarawak, Borneo.

You may find a better mixture to be one-third paraffin and the rest petrol. If you use too much paraffin you are liable to get trouble from dirty valves through imperfect combustion. Of course, in a warm climate you may be able to increase the proportion of paraffin to petrol slightly. We think 36 m.p.h. is quite as much as you can expect from this machine with a sidecar.

### Failure of Drip Feed.

**?** I have a drip-feed lubricator fitted to my motor bicycle and sidecar, which acts properly when the machine is stationary, but after I have been two or three miles the oil remains in the barrel and is churned into a froth, and it is not until the machine has been brought to a standstill for about ten minutes that the oil in the barrel finds its way into the oil pipe leading to the engine. The lubricator is new, and water-cooled oil is always used. If you could suggest a remedy I should feel much obliged.—W.A.R.

The cause of your trouble is undoubtedly due to the non-return valve, which should be fitted at the crank case end of the oil feed pipe, getting out of order, the ball or small metal disc having become stuck or failing to close properly owing to grit on the seating, the result being that the crank case pressure forces the oil back up the pipe into the lubricator. Thoroughly clean the non-return valve, and make sure there are no air leaks at any of the joints in the system.

### Refusal to Fire.

**?** I should be much obliged if you will help me out of my little difficulty with a twin Moto-Rève. I cannot get it to fire. The compression is good, and the engine gets the mixture all right. The magneto gives a good spark, even at low speeds, with the plug out. There is some sparking at the contact breaker. Can the magneto give a good spark with the plug out and not under compression? If so, what is the probable reason, for the spark in air is five-sixteenths of an inch long, and the plugs sound?—R.A.

The trouble may well be due to a defective inlet valve, the spring being too weak, or the valve being stuck up, for under these circumstances the magneto would give a good spark and yet the engine would not fire. If the magneto give a good spark with the plug on the cylinder, it is likely that the plug would fire all right under compression. See that there are no air leaks at the carburettor or induction pipe unions. It is possible under certain circumstances for the plug to fire in air but not under compression.

### PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER,

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always buying their copies from the same place, if possible or by giving a definite order to a newsagent for the regular supply of the journal each week.

**Age for Driving Licence.**

?

Would you kindly tell me the age one has to be to obtain a driving licence? At the Post Office they say they think it is seventeen years. I noticed recently in *The Motor Cycle* a young correspondent saying that he is going to get a motor cycle when he is fourteen years old.—L.B.

A licence to drive a motor cycle only may be obtained at the age of fourteen, but to drive a car the age limit is seventeen.

**Auxiliary Radiators.**

?

I should be glad if you would tell me whether you consider auxiliary radiators would be of assistance to me, and whether they could be fitted to an Enfield twin. My engine runs reasonably cool as long as the temperature keeps within reasonable limits, say 75° to 85°, but a "hot westerly" in the bush fire season sends it up to anything from 105° to 115° in the shade. I then find my machine gets very hot indeed, and at times seems to be almost red hot.—J.S.W. (Dudley, New South Wales).

Although you would undoubtedly find auxiliary cooling devices of assistance, we think there must be something wrong with the adjustment of your machine to cause such great overheating; even in spite of the high temperature, the machine should not get so hot as it apparently does. We would advise you to make sure you are not using too large a jet, also that the valve tappet clearance is correct, viz., not more than .4 mm. Also make certain the silencer gives no back pressure, and see that your engine is receiving plenty of lubrication. We think you will have no difficulty in fitting any of the auxiliary radiators at present on the market.

**Tuning Up.**

?

Which is the best setting of the plug points and contact breaker in order to pick up quickly on coming to a hill after turning a corner? I ride a 2½ h.p. twin two-speed model. Is it better to raise the exhaust lever when taking a corner, or to drive on the throttle and open out quickly? There are one or two hills in this district where my machine fails after taking a corner, and cause me to drop down to low gear, and I am unable to change up again into high until the level ground is again reached. In lubricating, is it necessary to have the exhaust on the smoky side? I have seen a machine with an Amac carburetter, where an extra air inlet (in the form of a compression tap) has been screwed in the centre of the induction pipe. Is that any assistance towards more power? I, of course, go round the engine for air leaks, and test carefully with oil.—E.H.

The plug points should be set to a distance of about  $\frac{1}{16}$  in. apart. It is better to close the throttle when slowing down at a corner. The reason you fail is because your machine is probably a little out of tune. You should overhaul the engine, and see that all the ordinary adjustments are correct, such as the valve springs, tappet clearance, and

so on. This should not be greater than .4 mm. at most. No; it is only necessary to have your engine smoking when it is working under a very heavy load, such as being driven all out or going up a long hill. Blue smoke shows that the machine is getting a little too much oil. There is no harm in your having a compression tap in the intake pipe if it is perfectly gastight and also the joint where it screws in; it might prove of use in hot weather.

**Loss of Power.**

?

A few months ago I bought a single-cylinder motor cycle, 1909 pattern. I have had it thoroughly overhauled, but can get little power from it. The piston and cylinder are clean, and the compression is good. There does not appear to be any air leakage, as I have bound all the joints with adhesive tape. When I bought the machine the air inlet to the carburetter was partly closed by a cork. This I removed. The jet appears to have been enlarged, and is now decidedly large. I have made the choke much smaller by inserting a piece of tubing in the carburetter so that the air space round the jet is now one-eighth of an inch all round. I thought that the smaller choke would increase the velocity of the air round the jet and give a better mixture. The machine will carry me for a few hundred yards (after giving trouble in starting), and then gets weaker and weaker until it stops. Would you advise me to buy a new carburetter or to look elsewhere for the source of my trouble?—H.E.W.



H. V. Norton, the leading West Australian rider, who is about to come home to serve the Mother Country. Practically every race meeting in Perth or any part of W.A. has resulted in Norton on a Sunbeam carrying off premier honours, and his most recent success was that of running second in the W.A. 150 miles Tourist Trophy race last October. It is expected that he will ride a Sunbeam in the next Isle of Man T.T.

It is difficult to say what is wrong with your machine from the details which you give, but everything points to the trouble being due to the carburetter. If this is a very out-of-date model it would perhaps be an advantage to fit one of a more modern pattern. The choke you are using at present seems exceptionally small, and no doubt the mixture is altogether too rich. See that the valves are seating properly, and that the springs are sufficiently strong.

**READER'S REPLY.**

In answer to "H.J.M." in *The Motor Cycle* of January 6th, I had a similar loss of power under practically the same conditions. I overhauled the engine; everything all right. On restarting it was all right for a few weeks, after which it started losing power again. By accident I opened the oil drain tap and put in some new oil, and it simply roared away. As soon as ever it started failing next time, I just opened the drain and it was all right again. I trust this may be of use to your readers, and wishing you every success with your paper.—J.A. (Bradwall, F.M.S.)

**EXPERIENCES WANTED.**

Readers desirous of obtaining the experience of others with various motor cycles or accessories must enclose a stamped addressed envelope in which the replies may be forwarded. Answers to the queries should be addressed c/o The Editor.

"J.K.W.R." (Warwick).—2½ h.p. two-stroke Excelsior for solo and sidcar work.

"Q.M.S." (Norwich).—De Luxe T.D.C. two-stroke. Reliability, speed, consumption, and ease of control.

**RECOMMENDED ROUTES.**

**KINGSTON-ON-THAMES TO OKEHAMPTON VIA CREWKERNE.**—W.R.W.

Kingston-on-Thames, Chertsey, Bagshot, Basingstoke, Whitechurch, Andover, Salisbury, Wilton, Shaftesbury, Sherborne, Yeovil, Crewkerne, Chard, Honiton, Exeter, Tedburn St. Mary, Okehampton.

**HIGH WYCOMBE TO TORQUAY.**—H.E.J.

High Wycombe, Great Marlow, Twyford, Reading, Newbury, Highclere, Andover, Salisbury, Wilton, Shaftesbury, Sherborne, Crewkerne, Chard, Honiton, Exeter, Chudleigh, Newton Abbot, Torquay.

**KINGSTON-ON-THAMES TO CARDIFF.**—A.B.

Kingston, Hounslow, Uxbridge, Beaconsfield, High Wycombe, Stokenchurch, Tetsworth, Oxford, Eynsham, Witney, Northleach, Andoversford, Cheltenham, Longlevens, Gloucester, Minsterworth, Westbury, Newnham, Blakeney, Lydney, Aylburton, Chepstow, Caerwent, Newport, Cardiff. 165 miles, approx.

**ILFORD TO WARMINSTER, SKIRTING THE CENTRE OF LONDON.**—S.B.P.

Ilford, Wanstead, Woodford, Chingford, Ponders End, Tottenham, Finchley, Hendon, Sudbury, Greenford, Southall, Heston, Hounslow, Staines, Bagshot, Basingstoke, Whitechurch, Andover, Amesbury, Shrewton, Heytesbury, Warminster.





### A Manchester Appointment.

Mr. E. Woods, whose name will be familiar to many Lancashire motor cyclists, has been appointed manager of the W. and H. Motor Co., Ltd., of 287, Deansgate, Manchester. The firm has the sole agencies for several makes of motor cycles and light cars.

### A British Magneto Guarantee.

Attention may be drawn to the very generous guarantee arranged by the Electric Ignition Co. (1913), Ltd., regarding the E.I.C. magneto. The guarantee has been made retrospective, and it covers every one of the 11,000 magnetos made by the company since August, 1914. This is conclusive evidence that the manufacturers of these magnetos have the utmost confidence in their goods.

### A Business Change.

T. Lester Jones informs us that he has purchased the business of Messrs. Bell and Smart, who have lately gone into liquidation. A new company is at present in formation, and will shortly be registered as Messrs. Bell and Smart, Ltd., 48-50, Tottenham Street, W.

### A Useful Enamel.

We are in receipt of a sample of Robbialac, the well-known preparation for painting and tonching up motor bicycle frames. If properly applied it gives a good finish, which closely approximates stoving. Together with the tin and brush has been sent us a sample of a dozen different colours in which Robbialac is supplied for enamelling motor cycles. It is made by Messrs. Jenson and Nicholson, Ltd., Stratford, E.

### Catalogues Received.

The Royal Ruby, a well-illustrated catalogue in which are described the lightweight models, two and four strokes, suitable for either lady or gentleman riders. The Royal Ruby Cycle Co., Ltd., Cannel Street, Ancoats, Manchester.

"The Brooks Book of Saddles, Bags, etc., for Cycles and Motor Cycles." This is the 1916 Brooks catalogue, and, needless to say, it is well produced, dealing as it does with articles of such good repute. At present J. B. Brooks and Co. are engaged on Government work, and extensions have been made to the factory.

We are in receipt of Proctor's Useful Tables. Edward Le Bas and Co., Dock House, Billiter Street, E.C. 6d. A useful little publication giving tables of metric weights and measures and the English equivalent, discounts from 2½% to 97%.

Avon Tyres—Motor Cycle and Cycle Section, 1916. The Avon India Rubber Co., Ltd., 19, Newman Street, Oxford Street, W. A comprehensive and well-illustrated catalogue, a glance through which impresses one with the completeness of the Avon range. The works are at Melksham, Wilts.

We have received the latest catalogue issued by the Stepney Spare Motor Wheel, Ltd., Stepney Works, Llanely, S. Wales. The chief items therein of interest to motor cyclists are the two types of Stepney motor cycle tyres, the Stepney Road Grip tyre, which is an efficient all-rubber non-skid; and another type for machines up to 3½ h.p. The tread is provided with ribs at the sides and rubber studs in the centre.

### The Public Schools Hill Climb.

There were some good performances at the Public Schools hill-climb, reported in our last issue, but attention may be drawn to the remarkably good showing made by J. V. Prestwich, Harrow, whose mount was a 2½ h.p. Calthorpe-Jap. He secured first place on formula in his class and fourth fastest time of the day.

### Reviews.

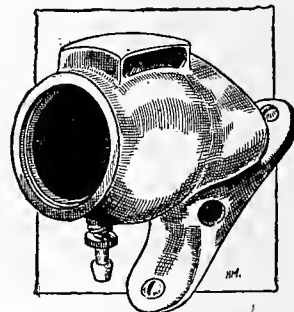
"Instruction Book on Operation, Care, and Adjustment of Indian Motor Cycles." With the great majority of motor cycle manufacturers engaged on munitions, the chances of a private owner having his machine overhauled at its birthplace are rather remote. Recognising this, the Hendee Manufacturing Co. have issued a new instruction booklet to facilitate the merest novice carrying out repairs and adjustments for which in peace times the machine would probably be sent to a garage or factory. This latest Indian booklet is certainly very complete, written in plain language, and well illustrated.

## Average Prices OF Second-hand Machines.

WE give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted, otherwise the last average is given, if within five weeks.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.B.C.	1915	3½ 4-speed	£63	—
A.J.S.	1915	6 3-sp. sidecar	£91	—
"	1912	6 2-sp. sidecar	£15	—
"	1915	2½ 3-speed	£47	—
"	1915	2½ 3-sp. T.T.	£50	—
"	1914	2½ 2-speed	£39	—
Allon	1916	2½ 2-stroke	£36	—
"	1915	2½ 2-stroke	£31	—
Bat	1914	3 3-sp. sidecar	£53	—
"	1915	6 2-sp. sidecar	£32	—
Blackburne	1915	3½ 3-speed	£53	—
Bradbury	1914	4 3-sp. sidecar	£41	—
"	1914	6 3-sp. sidecar	£59	—
"	1913	4 sidecar	£32	—
"	1913	4 2-speed	£26	—
B.S.A.	1915	4½ 3-sp. sidecar	£60	—
"	1914	4½ 3-sp. sidecar	£50	—
"	1913	3½ 2-sp. sidecar	£37	—
"	1915	4½ 3-speed	£47	—
Calthorpe	1915	2½ 2-speed	£27	—
"	1914	2½ 2-speed	£16	—
Campion	1914	6 sidecar	£51	—
Clyno	1913	6 3-sp. sidecar	£33	—
"	1912	6 2-sp. sidecar	£35	—
Cov. Eagle	1915	2½ 2-stroke	£25	—
Douglas	1915	2½ 3-speed	£45	—
"	1915	2½ 2-speed	£43	—
"	1915	4 3-sp. sidecar	£59	—
"	1915	2½ T.T.	£42	—
"	1914	2½ 2-speed	£40	—
"	1914	2½ 2-sp. T.T.	£34	—
"	1913	2½ 2-sp. kick start	£34	—
"	1913	2½ 2-sp. T.T.	£31	—
"	1913	2½ 2-speed	£38	—

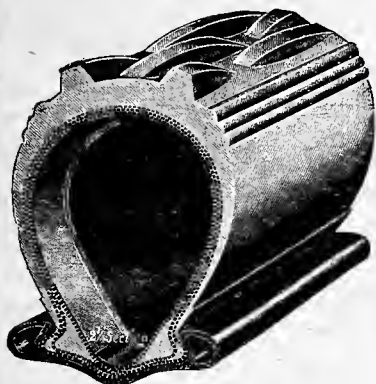
Make.	Year.	H.P.	Average for last week.	Latest average obtainable
Enfield	1916	6 2-sp. sidecar	—	£79
"	1915	8 2-sp. sidecar	—	£74
"	1915	6 2-sp. sidecar	—	£64
"	1914	6 2-sp. sidecar	£63	—
"	1913	6 2-sp. sidecar	£47	—
"	1912	6 2-sp. sidecar	—	£39
"	1915	3 2-speed	—	£39
"	1914	3 2-speed	—	£35
Excelsior (A)	1915	7 3-speed	—	£50
H.-Davidson	1915	8 3-speed	—	£67
"	1915	8 3-sp. sidecar	—	£68
Henderson	1913	4-cylinder	—	£29
Hobart	1915	2½ 2-stroke	—	£30
Humber	1914	2½ 3-speed	—	£26
"	1913	2½ 3-sp. sidecar	—	£33
"	1912	3½ 2-sp. sidecar	—	£26
"	1911	3½ 2-sp. sidecar	—	£22
Indian	1915	7 3-sp. sidecar	—	£75
"	1915	7 T.T.	—	£48
"	1915	5 3-speed	£55	—
"	1915	5 3-sp. sidecar	—	£65
"	1915	3½ 3-speed	—	£18
"	1914	2½ 2-sp. sidecar	—	£54
"	1914	7 2-speed	£45	—
"	1914	7 2-sp. T.T.	£38	—
James	1915	3½ 3-speed	—	£48
"	1915	4½ 3-sp. sidecar	—	£64
"	1914	4½ 3-sp. sidecar	—	£47
Lea-Francis	1914	3½ 2-speed	—	£48
Levis	1915	Popular	£23	—
Matchless	1914	8 3-sp. sidecar	—	£71
"	1913	8 2-sp. sidecar	£50	—
"	1915	8 3-sp. sidecar	—	£88
"	1913	6 2-sp. sidecar	£43	—
New Hudson	1916	6 3-sp. sidecar	—	£61
"	1915	2½ 2-speed	—	£29
New Imperial	1915	2½ 2-speed	—	£26
Norton	1915	3½ T.T.	—	£46
P. & M.	1914	3½ 2-sp. sidecar	—	£60
"	1913	3½ 2-sp. sidecar	—	£38
"	1915	3½ W.O.	—	£59
Premier	1915	3½ 3-speed	—	£44
"	1914	2½ 3-speed	—	£20
"	1914	3½ 3-sp. sidecar	£47	—
"	1913	3½ sidecar	—	£34
Rex	1913	6 2-sp. sidecar	—	£40
Rover	1915	3½ 3-sp. sidecar	—	£63
"	1914	3½ 3-sp. sidecar	—	£42
"	1914	3½ 3-speed	—	£38
"	1913	3½ 3-sp. sidecar	—	£34
Royal Ruby	1915	2½ 2-stroke	£24	—
Rudge	1915	3½ multi T.T.	—	£52
"	1914	3½ multi sidecar	—	£44
"	1914	3½ multi	—	£36
"	1913	3½ multi	—	£29
"	1913	3½ multi sidecar	—	£34
"	1912	3½	£27	—
Scott	1914	3½ 2-sp. sidecar	—	£52
"	1913	3½ 2-sp. sidecar	—	£38
"	1912	3½ 2-sp. sidecar	£36	—
Sunbeam	1915	3½ 3-sp. sidecar	—	£69
"	1915	3½ 3-speed	—	£59
Triumph	1915	2½ 2-sp. 2-stroke	—	£36
"	1915	4 3-speed	—	£41
"	1914	4 3-speed	£40	—
"	1914	4 3-sp. sidecar	£49	—
"	1913	3½ 3-speed	£32	—
"	1913	3½ 3-sp. sidecar	£48	—
Williamson	1914	8 2-sp. sidecar	—	£70
Wolf	1914	2½	—	£18
Zenith	1913	8 Gradua sidecar	—	£52



A neat aluminium rear lamp sold by Brown Bros., Ltd., and designed to be attached to the rear mudguard. The whole lamp is a one-piece casting; the rear glass is, of course, red, while the front glass which is nearly opposite to it is white, so that the light is reflected on to the number plate.

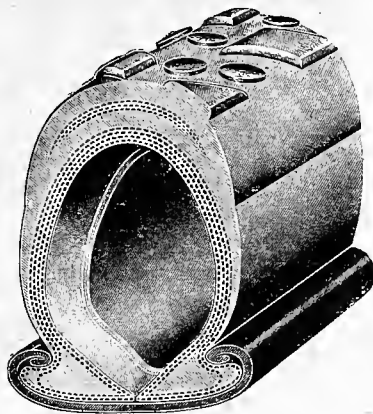
# TYRE ECONOMY

## SPECIAL CLEARANCE LINES (Discount allowed to the Trade.)

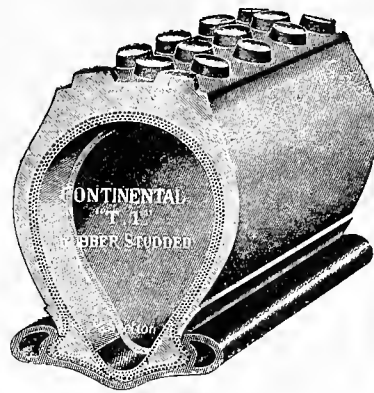


Continental Basket Pattern.

26 x 2½ .. 14/6 List Price 26/6.

Continental Combination.  
(Specially constructed for rear wheel of heavy sidecar outfits.)

28/- List Price 54/- 26 x 2½ only



Continental T.T. Studded Heavy.

26 x 2½ .. 21/6. List Price 34/-

### COVERS.

CONTINENTAL.	Our Price.	List Price.
26 x 1½ Standard .....	9/-	12/6
26 x 2 " " .....	10/6	19/6
26 x 2½ " " .....	14/6	23/6
28 x 2½ " " .....	15/-	25/-
28 x 2½ " " .....	17/6	27/6
26 x 2½ Standard, wired-on .....	10/-	25/-
26 x 2½ Model de Course .....	18/6	33/3
28 x 2½ " " .....	18/-	34/-
26 x 2½ Lightweight T.T., basket pat. ..	12/6	21/-
26 x 2½ T.T., basket pattern .....	15/-	22/3
26 x 2½ " " .....	15/-	26/6
26 x 2½ " " .....	17/6	28/-
26 x 2½ x 2½ " " .....	21/6	28/9
26 x 3 for 2½ " " .....	22/6	37/9
28 x 3 " " .....	30/-	41/3
26 x 2½ " " heavy .....	21/6	34/-
26 x 2½ x 2½ " " .....	26/6	37/6
26 x 2½ " " .....	27/-	37/6
26 x 2½ Combination .....	29/6	54/-
650 x 65 Autobi .....	22/-	39/6
650 x 65 Fluted pattern .....	19/6	28/-
650 x 75 or 700 x 80 Autobi rubber-studded .....	31/6	44/3

650 x 65 Heavy Fluted 19/- 33/-

### CLINCHER.

24 x 2 De Luxe Heavy Cover .....	13/6	25/6
" (with tube complete) .....	17/6	32/-
26 x 2½ De Luxe .....	21/-	32/-
26 x 2½ " .....	23/6	36/3
28 x 3 " .....	35/-	48/6
26 x 2½ for 2½ De Luxe, wired-on ..	21/-	37/-
26 x 2½ Dreadnought .....	27/6	40/-

### COVERS.

	Our Price.	List Price.
26 x 2½ x 2½ Dreadnought .....	32/6	40/-
26 x 2½ A Won, rubber-studded ..	21/-	32/-
26 x 2½ " " .....	22/6	32/-
26 x 2½ " " ribbed .....	14/6	27/6
26 x 2½ B quality, rubber-studded ..	13/6	26/6
650 x 65 Fluted .....	21/-	30/6

### KEMPSHALL.

28 x 3 Heavy non-skid .....	45/-	70/-
26 x 2½ " anti-skid .....	22/6	32/6
28 x 3 " " .....	25/-	57/6

### WOOD-MILNE.

26 x 2 Grip-ribbed, heavy .....	15/9	26/9
26 x 2½ Combination, heavy .....	30/-	42/-
26 x 2½ " extra heavy .....	35/-	48/6
26 x 2½ Grip-ribbed, extra heavy ..	20/-	32/6
26 x 2½ Combination, heavy .....	25/-	39/-
26 x 2½ " extra heavy .....	30/-	45/-
26 x 2½ Grip-ribbed, heavy .....	17/6	29/-
26 x 2½ " extra heavy .....	22/6	36/-
26 x 2½ " heavy .....	21/-	30/6
26 x 2½ " extra heavy .....	26/-	37/6
26 x 2½ Combination, heavy .....	32/6	45/-
26 x 2½ " extra heavy .....	37/6	52/6
26 x 2½ " heavy .....	35/-	48/-
26 x 2½ x 2½ " extra heavy ..	40/-	56/6
" Grip-ribbed, heavy .....	22/6	32/9
" extra heavy .....	27/6	40/-
26 x 3 " heavy .....	25/-	36/6
26 x 3 " extra heavy .....	30/-	44/-
28 x 2 " heavy .....	17/6	30/6
28 x 2 " extra heavy .....	22/6	37/-
28 x 2½ " heavy .....	22/6	21/9
28 x 2½ " extra heavy .....	27/5	39/-

### COVERS.

AVON.	Our Price.	List Price.
26 x 2½ Tricar .....	27/6	38/6

### TUBES.

CONTINENTAL.	Our Price.	List Price.
26 x 1½ .....	4/-	6/6
26 x 2 .....	4/3	7/3
26 x 2½ .....	4/9	7/9
26 x 3 .....	5/3	8/6
26 x 2½ .....	5/3	8/9
26 x 2½ x 2½ .....	5/9	8/9
650 x 65 .....	5/6	11/6
650 x 75 or 700 x 20 .....	6/-	14/-
24 x 2 .....	4/6	8/5
28 x 2½ .....	7/-	10/6
28 x 3 .....	7/9	12/6

Butted, 1/- extra.

### BELTS.

CONTINENTAL.	Our Price.	List Price.
1 in. section .....	1/3	2/2
1½ in. " .....	1/-	1/11

### CLINCHER FLEXIS.

	Per foot.
1½ in. section (8 ft. 6 in. lengths only)	1/6 2/6
1 in. " (7 ft. 6 in. and 7 ft. lengths)	1/3 2/1
1½ in. " (7 ft. & 7 ft. 6 in. lengths)	1/- 1/9
1 in. " (7 ft. & 7 ft. 6 in. lengths)	-/11 1/6

### RETRADING.

Special Heavy, 15/-; Heavy, 12/6; Medium 10/-; Studded or Ribbed Retreads.

Sections on application.

TIME REQUIRED, 3 DAYS FROM RECEIPT OF COVER.

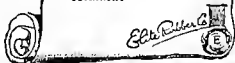
We offer a 3/- Outfit free of charge to all purchasers of goods to the value of £1 and over.

ALL MAKES OF TYRES IN STOCK.

All goods sent on seven days' approval against remittance. Carriage forward, unless postage is sent.

### McGuarantee

all these goods to be quite new, and are prepared to replace any tyre that proves faulty at a price proportionate to the mileage obtained.



These treads when fitted make the cover equal to the heaviest cover manufactured.

These treads when fitted make the cover equal to the heaviest cover manufactured.

## ELITE RUBBER Co., Ltd.,

266, Vauxhall Bridge Rd., Victoria, S.W.

Phone: Victoria 6553.

One Minute Victoria Station.

In answering this advertisement it is desirable to mention "The Motor Cycle."

# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.**, and crossed **& Co.**

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pay carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### Abingdon.

**A** BINGDON, 3½ h.p., 2-speed, F.E., torpedo sidecar, all accessories, condition perfect; bargain, £28. Tel.: 1614 Brixton.—B., 7, Binfeld Rd., Stockwell, S.W. [4410]

### A.J.S.

**A** J.S., new 1916, 6 h.p. and 2½ h.p. models actually in stock.—Moss, Wem. [X8327]

**A** J.S. Models in stock, with sidecars.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

**A** J.S., 4 h.p., 2-speed, and two sidecars; £45; little used.—Varrell, Crocken Hill, Kent. [4306]

**1914** 5-6 h.p. A.J.S. Combination, fitted with speedometer, lamp, horn, tools, etc.; £42, a bargain.—F. E. Wooten, 19, Warwick St., Oxford. [4257]

**A** J.S., 1915, 4 h.p., and Millford Corvette sidecar, all accessories, perfect condition, recently overhauled; cash £60.—V. Harper, High St., Newmarket. [4247]

**A** J.S., 6 h.p., countershaft 3-speed gear, fully equipped, fitted with Mills and Fulford coachbuilt sidecar; the combination complete 70 gns., guaranteed.—Wanchope's, 9, Shoe Lane, London. [X7939]

**1913** 6 h.p. A.J.S., good order and condition, Montgomery wicker sidecar, lamps, horn, Cowey, tools and spares; £47, or exchange for lower power with cash adjustment.—Godwin Bros., Woking. [X7932]

## MANY LINES OF DOUBLE IMPORTANCE

ARE INCLUDED IN

**WAUCHOPE'S**

## CLEARANCE OFFERS

Important because of their LOW PRICE—far below real value; doubly important because they cannot be repeated; and, in addition, all our great stock of New and Second-hand Bargains of Test makes at LOWEST PRICES, EASIEST EASY TERMS, and MOST GENEROUS EXCHANGES, better than ever.

## GET TO-DAY'S BARGAIN LIST. IT INCLUDES:

No.	h.p.		
10337.	3½	1914 RUDGE Multi	£39 0
10341.	2½	1913 2-sp. DOUGLAS	£35 0
10342.	1½	1914 AUTO-WHEEL	£10 10
10343.	4	1915 3-sp. JAMES and Sidecar	£63 0
10346.	4	1914 3-sp. TRIUMPH and Sc.	£55 10
10353.	7-8	1916 2-sp. GARDEN Monocar	£50 0
10354.	4	1914 2-sp. BRADBURY	£27 10
10356.	2½	1915 2-sp. CALTHORPE-J.A.P.	£27 10
10357.	3	1914 single-speed L.M.C.	£25 10
10318.	6	1912 2-sp. REX Sidette	£26 0
10320.	2½	1915 2-sp. CALTHORPE-J.A.P.	£25 10
10322.	5-6	1914 RUDGE Multi and Sidecar	£40 0
10323.	2½	1911 2-sp. DOUGLAS	£25 0
10324.	2½	NEW IMPERIAL-J.A.P.	£25 0
10325.	3	Single-speed CENTAUR	£12 10
10330.	0	1914 3-sp. 'C'abin Drive REX and Sidecar	£55 0
10332.	3½	Single-speed BROWN	£15 0
10333.	3	1908 2-sp. TRIUMPH and Sc'ar	£32 10
10335.	4-5	1915 2-sp. BAT	£52 10
10336.	8	1914 Countershaft ZENITH and Sidecar	£80 0
10291.	3½	NORTON, variable gear	£37 10
10300.	2	1914 2-sp. CALTHORPE Junior	£17 10
10301.	8	1913 BAYARD Light Car	£125 0
10302.	10	1915 RITZ Light Car	£110 0
10304.	2½	1913 2-sp. DOUGLAS	£30 0
10254.	2½	1916 2-sp. ALLON	£35 0
10260.	3	1914 2-sp. ENFIELD	£32 10
10268.	10	1913 2-sp. HENDERSON & Sc.	£55 0
10271.	2½	1915 2-sp. LEVIS	£37 10
10274.	2½	1915 2-str. ROYAL ENFIELD	£32 10
10232.	2½	1915 2-stroke WOLF	£20 0
10223.	2½	1914 2-sp. 2-stroke CLYNO	£27 10
10221.	1½	1915 J.E.S.	£20 0
10205.	3	1915 N.S.U.	£20 0
10200.	15	1915 TRUMBULL Light Car	£100 0
10172.	10	1914 2-sp. HENDERSON & Sc.	£55 0
10142.	3	1913 3-sp. SINGER	£32 10
10113.	20	1913 4-cyl. FORD	£67 10
10109.	3	1909 F.E. TRIUMPH	£25 0
10093.	3½	1913 3-sp. ROVER Combination	£40 0
10087.	6	1914 4-cyl. Baby PEUGEOT Light Car	£97 10
10075.	6	BEDELIA Cycle Car	£25 0
10070.	6	1914 2-sp. ENFIELD Combination	£65 0
10068.	3	1912 QUADRANT, variable gear	£20 0
10021.	3½	1912 G.WIFT	£20 0
9953.	2½	1915 2-sp. 2-stroke TYLER	£27 10
9946.	2	1914 3-sp. T.T. FORWARD	£29 0
9931.	6	1914 3-sp. A.J.S. and Sidecar	£73 10
9896.	6	1913 2-sp. twin ENFIELD	£35 0
9867.	2½	1917 2-sp. ENFIELD	£22 10
9847.	2½	1915 3-sp. QUADRANT	£42 10
9839.	3	1907 TRIUMPH and Sidecar	£22 10
9772.	3½	1914 w-cooled 3-sp. HUMBER	£35 0
9633.	2½	1912 PREMIER, variable gear	£18 10

**WAUCHOPE'S**, 9, 8H0E LANE, FLEET ST., LONDON

'Phone: 5777 Holborn. Wires: "Opifcer, London."

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**A** J.S., 1915, 6 h.p., new combination, with apron, spare wheel and tyre, complete; cash £110/4, or by deferred payments 2% only extra; from stock.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [4500]

**1916** 6 h.p. A.J.S., No. 1 Bremble sidecar, Dunhill's triple wind screen, electric head, tail lamps, horn, tools, little used, condition perfect; £90.—Apply, F. W. Sutton, Shirwith, Langwithby, Cumberland. [4435]

**A** J.S. 1912 6 h.p. Twin Combination, 2-speed, countershaft gear, clutch, and kick starter; £48.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [4117]

**A** J.S., late 1915, T.T., 2½ h.p., 3-speed, detachable wheel, mileage 500, P. and H. head lamp, Lucas rear lamp and generators, horn, and watch, as new; £50, or exchange higher power.—Box 330, c/o The Motor Cycle. [X7883]

**A** J.S. 1915 6 h.p. Combination, spare wheel, Cowey speedometer, Lucas lamps and horn, spare chains, etc.; £75, lowest; Manchester district.—Bdr. G. Billington, 114, Siege Battery, R.G.A., Roffey Camp, Horsham, Sussex. [X7975]

**A** J.S., 2½ h.p. T.T., 1914, lamp, horn, speedometer, and Watsonian cane sidecar, with back locker, 3-speed, new set gears, two of tyres only run 200 miles (Palmer and Bates); expert examination; £40 for outfit; £35, solo.—Anderson, 2, Lansdowne Crescent, Edinburgh. [X6232]

**A** J.S., 1914, complete combination, 6 h.p., detachable wheels, best Lucas fittings, new wind screen just fitted, new Stoney 700x80 fitted to hack wheel, new Glischer to front; ridden only at week-ends, the combination is equal in every way to brand new, and only wants seeing; £71, offers ignored; called up.—Wooler, Church Rd., Rhos-on-Sea, Colwyn Bay. [4428]

### Alldays.

**ALLDAYS** Allon, all models; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 352, High Holborn. [0763]

**ALLDAYS** Allon, 1916, 2-stroke, splendid condition; £28.—Rifemas Rudall, 37 Hut, Hatments, Wimbeldon Common. [4358]

**1915** Allon, 2-speed, 2-stroke model, splendid condition, not done 150 miles; £35.—Roberts, Mill House, Aberaman, Aberdare. [4346]

**ALLON**, 1915½, 2-speed, lamp, horn, speedometer, chain guards, etc., equal to new; £32.—Chapman's, Engineers, Ranelagh Gardens, Hurlingham. [4393]

**ALLDAYS** Allon 2-stroke Motor Cycles from £34 to £52/10; early delivery; deferred terms from one-quarter down, balance by 12 monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Alldays Allon motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4057]

### Ariel.

**ARIEL**, 1914, 3½ h.p., countershaft 3-speed, Ariel coach sidecar; £45.—58, Castle Bar Rd., Ealing. [4237]

**ARIEL**, 1913, 3½ h.p., 3-speed, Gloria sidecar, speedometer; £35.—Mackintosh, 18, Baroncourt Terrace, Edinburgh. [X7893]

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## NEW 1916 MODELS.

LEVIS, 2½ h.p., 2-stroke	£32 0
SUNBEAM, 3½ h.p., 2-speed	£73 10
EXCELSIOR (American), 7 h.p., 3 speeds	£75 0
CALTHORPE Minor, 2-seater	185 gns.
NEW IMPERIAL, 2½ h.p., variable magneto	£38 0

DOUGLAS MODELS.—Orders booked now.

## (U.S.A.) EXCELSIOR,

1916, 7 h.p., 3-speed model, 84×89, countershaft gear chain drive, mechanical and hand lubrication, high-tension magneto, multiple-disc clutch with dual control, kick starter, 2 gallons petrol capacity; £75. Exchanges quoted. Easy Payments arranged. Sole Yorkshire distributors. Trade supplied.

## NEW 1915 MODELS.

*CONNAUGHT, 2½ h.p., 2-speed	£41 16
*WOLF-J.A.P., 2½ h.p., 2-speed	£38 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed	£39 10
*ROYAL RUBY, 6 h.p., 3-speed	£67 0
U.S.A. EXCELSIOR, 7 h.p., dyna. lighting, etc.	£71 10

\*Cash offers wanted.

## PERFECTION SIDECARS

to suit American Excelsior and Harley-Davidson machines, 28×3 Dunlop tyre, grey coach-built body and chassis £13 10

## SOLO MACHINES.

1915 4½ h.p. 2-speed LINCOLN-ELK, as new	£38 10
1913 3½ h.p. ROVER, 3-speed	£37 10
1913 3½ h.p. F.E. RUDGE	£26 10
1913 3½ h.p. ROVER, Graded gear	£27 10
1912 3½ h.p. 2-speed TORPEDO	£19 19
1912 3½ h.p. ZENITH-GRADUA	£26 10
1912 3½ h.p. 2-sp. BRADRUPE, chain drive	£29 10
1912 3½ h.p. 2-speed F.E. PREMIER	£27 10
1912 2½ h.p. DOUGLAS, kick start	£21 10
1912 3½ h.p. 2-speed F.E. HUMBER	£26 10
EXCELSIOR, 3½ h.p., 3-speed, Druid forks	£19 19
KERRY, 3 h.p., magneto, Saxon forks	£12 10
5½ h.p. Magneto REX, spring forks	£12 10
N.S.U., twin, 2-speed, spring forks	£15 10
TRIUMPH, 3 h.p., magneto, new tyres	£18 10
REX, 3½ h.p., 2-speed, wants attention	£12 10
P. & M., 3½ h.p., 2-speed, chain drive	£27 10
S.P.K., 3½ h.p., 3-speed countershaft	£25 10
REX, 1910, 5-6 h.p., 2-speed, F.E.	£22 10
REX, 1909, 5-6 h.p., 2-speed, F.E.	£18 10
REX, 3½ h.p., mageto, spring forks	£11 15

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3½ h.p. 2-speed P. & M. and Sidecar	£19 19
REX 5½ h.p., 2-speed, and Sidecar	£22 10

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MORGAN, 1914, hood, screen, lamps, speedometer, overhauled and repainted	£79 10
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RENO 15 h.p. 4-cylinder Touring Car	£65 0
PREMIER 7-9 h.p. 2-seater Light Car	£67 10
1916 12 h.p. New Type OVERLAND	£225 0
New Mechanical Horns	17/6
New Acetylene Tail Lamp, post free	1/4
At Midscreen, cost 21/-, take	10/6
P. & H. Separate Generator Lamp	17/6
Millers Late Type Lamp Set	£1 4
REX, 6 h.p., twin engine, magneto and carburettor	£9 10

Cash Offers Wanted.

WANTED.—Second-hand Douglas, for cash.

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DOUGLASES.—Order the new 1916 models now, which are due in just after Easter; orders issued in strict rotation.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4452]

NEW 1916 Douglas to hand, model U, 2½ h.p.: £50 to first arrival, with all spares, gallon can unopened, Price's Oil de Luxe, horn; no offers: machine must be fetched.—Blackham, Chemist, Oldbury. [X8314]

1914 Douglas, 2-speed, kick starter, clutch, speedometer, head lamp, horn, new back tyre, good condition: 36 gns.—Jahans, Broad St., Reading. Biggest motor cycle and light car dealers in the South. Phone: 1024. [X8364]

DOUGLAS Agents and Specialists. We refrain from mentioning 1916 models, as at present there is no likelihood of obtaining deliveries. We can supply and deliver the latest models brand new at rock bottom prices. Tel.: 383. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [4438]

Elswick.

ELSWICK, 1915, 2-stroke, 2½ h.p., Druids, Amac, U.H. mag., done 5000 miles: £18/10.—Write, Spink, 28, Winfrith Rd., Baisfield, S.W. [4215]

Enfield.

LATE 1913 Enfield 6 h.p. Combination: cash offers.—Kimber, Curry Ridge, Somerset. [4308]

1915 3 h.p. Enfield, all accessories, done 2,500 miles: £37/10, cost £56 May.—Burns, Newbury. [X8313]

ENFIELD Combination, 1914, coachbuilt, smart lot: £47/10.—11, Luna Rd., Thornton Heath, S.E. [4519]

2½ h.p. Enfield Twin, good running order: £11.—24 Bridge, 19, Ellerker Gardens, Richmond Hill, Surrey. [4329]

ENFIELD 1916 Combination, 6 h.p.: 85 gns.; exchanges quoted.—D. J. Shepherd and Co., Enfield Highway. [4391]

1916 Model 180 6 h.p. Royal Enfield Sidecar Combination actually in stock: 85 gns.—Alfred Proctor, Chestow. [X7921]

ENFIELD, March, 1916, 3 h.p., £52/10 model, once used: substantial reduction.—Box 334, c/o The Motor Cycle. [X7982]

ENFIELD, 1915, 3 h.p., 2-speed, clutch, perfect condition, not done 1,000 miles, excellent tyres: £42/10.—Norton, Newtown. [4495]

ENFIELD 2-stroke, 1914, 2-speed, Palmer tyres, in splendid order, guaranteed: £36; easy payments if desired.—Jones, Garage, Broadway, Muswell Hill. [4356]

3 h.p. Enfield, 1914, 2 speeds, clutch, kick starter, T.T. bars, lamps, horn, spares, etc., perfect condition: £32.—Boyer, 16, Hamilton Terrace, St. John's Wood. [4476]

1915 6 h.p. Enfield de Luxe Combination, Lucas set, speedometer, etc.: cost 100 gns., new tyres: sacrifice £77.—25, Mayfield Rd., Gosforth, Newcastle-on-Tyne. [8099]

ENFIELD 6 h.p. and 8 h.p. models actually in stock; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4458]

ENFIELD 6 h.p. Combination, late 1914, not done 5,000 miles, 2 new tyres and tubes, speedometer, Lucas lamps, and Pillion seat: £70.—Trigg, Newington, Sittingbourne. [X7846]

ENFIELD 6 h.p. Coachbuilt Combination, late 1914, in perfect condition, very little used; trial Saturday or Sunday: £63.—H. Cooper, 4, Bickley Terrace, Chislehurst, Kent. [X8340]

NEW Royal Enfield, 6 h.p., 2-speed and free engine. Enfield combination sidecar, cannot take delivery: £85 for quick sale; never been on the road.—Heap, 157, Whalley Rd., Accrington. [X7886]

ENFIELD, 6 h.p., 1916 electric model, with hood and screen: £105; only shop-soiled; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4459]

ENFIELD 1916 6 h.p. Combination, delivery from stock, £89/5; exchanges or extended terms arranged on liberal terms.—Elce and Co., Official Enfield Agents, 15-16, Bishopsgate Av., Camomile St., E.C. [0479]

6 h.p. Enfield Combination, 1915½ machine, and sidecar, complete, as new, Lowell and Haines lamps, Watford speedometer, horn, fully insured, transferable: £85.—Seymour, 649, Washwood Heath Rd., Birmingham. [4256]

1916 Model Royal Enfield Motor Cycle and sidecar combination, complete with all spares and speedometer, 6 h.p., 2-speed gear, hand starting, run only 2,000 miles: £70, cost £102.—Stiles, 31, St. Andrew St., Norwich. [X8234]

ENFIELD, 3 h.p., solo motor cycle, £52/10: one only of these which has done under 200 miles, condition as new, £45; 6 h.p. combination, £89/5, or from stock; deferred payments 2% only extra.—Win. Whiteley, Ltd., Queen's Rd., London, W. [4503]

ENFIELD Combination, 6 h.p., bought new last year, coachbuilt sidecar, fitted with speedometer, 2 lamps and rear light, horn, watch, spares and tools, tyres as new, Michelin steel-studded on back, perfect condition; only trial or expert examination; ready to ride away without any extra expenditure of any kind; owner bought car; lowest price for quick sale, £60.—B. Colwell, Lorna, Leckhampton Rd., Cheltenham. [4449]

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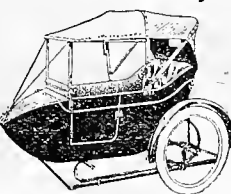
1916 MORGAN-DE-LUXE, all on	£121 0
1916 MORGAN (Sporting), all on	£103 0
1916 4 h.p. A.J.S. Combination, interchangeable wheels	90 gns.
1916 6 h.p. ENFIELD Combination	85 gns.
1916 8 h.p. ENFIELD Combination	87 gns.
1916 6 h.p. A.H. Combination	87 gns.
1916 6 h.p. NEW HUDSON	72 gns.
1916 6 h.p. NEW HUDSON Combination	88 gns.
1916 2½ h.p. NEW HUDSON, 2-sp., 2-stroke	£38 0
1916 2½ h.p. OMEGA-J.A.P., 2-sp.	38 gns.
1916 2½ h.p. OMEGA, 2-stroke, 2-speed	38 gns.
1916 8 h.p. British EXCELSIOR Combination, Jardine 4-speed gear	£98 0
1916 5-6 h.p. British EXCELSIOR, Sturmer countershaft 3-speed gear	68 gns.
1916 4½ h.p. British EXCELSIOR, Sturmer countershaft 3-speed gear	64 gns.
1916 FORD Touring Car, 20 h.p.	£135 0
1916 FORD Chassis, 20 h.p.	£115 0
1916 FORD Van 20 h.p.	£130 0
1916 20 h.p. FORD Ambulance	£135 0
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on	£120 0

## SECOND-HAND BARGAINS.

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3½ h.p. NEW HUDSON, 3-speed, combined drive, lamp, horn, etc.	£33 0
3½ h.p. ROVER, 1913, 3-speed	£29 0
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2-speed RADO, 2-stroke, fine condition	£25 0
2-stroke OMEGA, Druid forks	£19 0
1914 DOUGLAS, 2-speed, fine machine	£36 0
3½ h.p. N.S.U., spring frame, 2-speed	£17 0
3½ h.p. TRIUMPH, 1917, clutch model	£22 0
3½ h.p. 1908 TRIUMPH, fine gear	£17 0
3½ h.p. 1909 CEX de Luxe, 2-speed, handle starting	£19 0
1913 FORD, English body, Bosch magneto, disc wheels	£34 0

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Underslung Chassis,  
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Canoelet Sidecar, very fine	£8 0
Free Single and Twin magnetos	2/6
New 650×65 Dunlop Rubber-studded Covers	22/5
8-10 h.p. Precision Engine, quiet new. What offers?	
6 h.p. Twin Aotoine Engine, water-cooled	£6 0
8 h.p. J.A.P. Twin Engine, air-cooled	£12 12
F.R.S. Lamp Set, 500 beam, shop-soiled	35/-
F.R.S. Lamp Set, 1,000 beam, shop-soiled	45/-
New Chocher Clearance Covers, de Luxe, "heavy," rubber-studded, 26×2½, 26×2½, 26×2½, and 26×2½×2½	each
Latest Mechanical Horn, black and nickel	£1 0
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**EXCELSIOR** Combination, 1915, 4½ h.p., first-class order, newly shod, usual accessories, and plenty expensive spares, tubes, urgent sale, bargain. £45.—265, Stratford Rd., Birmingham. [X7909]

## Fairy.

**FAIRY** 2½ h.p. Twin, opposed, slight attention to controls; bargain, £5.—Call, 8, Luxford St., Rotherhithe, S.E. [X8236]

## Forward.

**2½ h.p.** Twin-cyl. Forward, 3-speed and free engine model, overhauled and guaranteed complete with all accessories; £25; fast T.T. model.—Wauchope's, 9, Shoe Lane, London. [X7952]

## F.N.

**F.N.**, 1912, 4-cyl., 2-speed gear, splendid condition; £22.—Earl, 5, Heath St., Hampstead. [4436]

**F.N.**, 5 h.p., perfect running order; sell or exchange lightweight, little cash.—Fearn, Burstead, Billericay. [4341]

## Harley-Davidson.

**BRAND** New Harley-Davidsons.—See below.

**MODEL F.** 7-9 h.p., 3-speed; £68.—The Premier Motor Co.

**MODEL J.** 7-9 h.p., 3-speed, with dynamo electric lighting outfit; £75.—The Premier Motor Co.

**THE** Above are guaranteed brand new; standard specification and standard equipment.—The Premier Motor Co., Birmingham.

**SPECIAL** Gloria Sidecars, to match; 19 and 25 gns. You save £17 by purchasing your new combination direct from the recognised H.D. experts. Delivery carriage paid to any address.—The Premier Motor Co., Aston Rd., Birmingham. [4467]

**HARLEY-DAVIDSON**, model 11F, Nov., 1915, unused, 2-strokes; £78/5.—Bond, 245-247, Euston Rd., N.W. [X8316]

**HARLEY-DAVIDSONS**, 1916 models; immediate delivery from stock.—Colmore Depot, 261, Deansgate, Manchester. [3656]

**HARLEY-DAVIDSON** Models in stock, complete with Gloria sidecar.—Turpins, 22 and 29, Preston Rd., Brighton. [0713]

**HARLEY-DAVIDSON** and coachbuilt sidecar, new June, 1915, model 11F; £80 lot.—Bond, 245-247, Euston Rd., N.W. [X8315]

**LATE** 1915 Harley-Davidson and sidecar, electric equipment, as new; £80; Douglas part payment.—Nelson, Gloddath St., Llandudno. [X7978]

**1915 7-9 h.p.** Harley-Davidson, 3-speed, dynamo lighting set, Gloria grey sidecar to match, excellent condition; what offers.—Castle Motor Co., Ltd., Showroom, Kidderminster. [X8113]

**HARLEY-DAVIDSON** Model J, new September, 1915, electrical equipment, 22 gns. sidecar, and spare parts; £75, or nearest; done just on 2,000 miles.—156, Sultan Rd., Portsmouth. [X7881]

**HARLEY-DAVIDSON**, 7-9 h.p., 1915, with Canelet sidecar, tandem model, hood and screen, guaranteed brand new, with lamp, horn, and speedometer; best offer.—Guest, Mill Mead, Shrewsbury. [X7796]

**HARLEY-DAVIDSON**, in stock, with or without sidecars; have one for 1916. 1915 riders say they're "simply it." Deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4450]

**HARLEY-DAVIDSON** 1915 4-6 h.p. Motor Cycle, P. and M. lamp and horn, splendid condition, with 20 gns. coachbuilt sidecar (practically new), and fitted with hood, screen, and apron, for sale; war bargain; owner grouped.—18, Wharf St., Stockton-on-Tees. [4353]

**HARLEY-DAVIDSON**, 1915, model 11C, 4½ h.p., single-cyl., 2-speed, chain drive, kick starter, H.D. head lamp, tail lamp, and horn set complete, only done 1,500 miles, appearance and mechanical condition as new; £45.—The Premier Motor Co., Aston Rd., Birmingham. [4472]

**1915** Harley-Davidson, delivered November, 1915, 7-9 h.p., 3-speed clutch model, new Palmer cord car size tyre on rear wheel, fitted with very smart almost new Mills-Pullard sidecar, upholstered in green, wind screen, dust cover, etc., unused Dunlop heavy tyre fitted; price £68.—Vincent Motor Co., Rugby Camp, nr. Stafford. [4268]

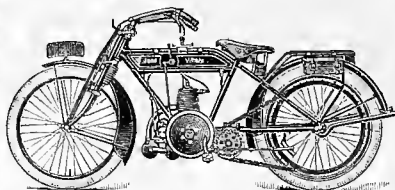
## Hazlewood.

**HAZLEWOOD**, 1913, 2½ h.p., 3 speeds, Stewart speedometer, lamps, etc., best offer near £19.—31, Beechwood Av., Thornton Heath. [0795]

## Henderson.

**HENDERSON** 4-cyl. Motor Cycle, £85 nett; early delivery; deferred terms from one-quarter down, balance by twelve monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally homegrown. We garage Henderson motor cycles for 1½ per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4058]

# JUNO MOTOR CYCLES ARE THE VERY BEST



Sergt-Major J. BENNETT, Upavon, Wilts, writes under date 28/3/16:

"I am pleased in every way with my **JUNO V.T.S.** motor. It has given me not the slightest trouble the whole twelve months I have run it, approximately 10,000 miles. The bearings are good as new, no shake anywhere."

This is only one of many testimonials as to the high quality of the "**JUNOS**."

**JUNO**, 2½ h.p., £29 10s., or £6 deposit and 41/8 month.

" 2-speed, £36, or £7 8s. deposit and 51/- month.

" V.T.S., £30 10s., or £6 4s. deposit and 43/- month.

" 2-speed, £37, or £7 16s. deposit and 52/- month.

" 4 h.p., £62 15s., or £16 deposit and 83/4 month.

" 6 h.p., £75 12s., or £16 10s. deposit and 105/- month.

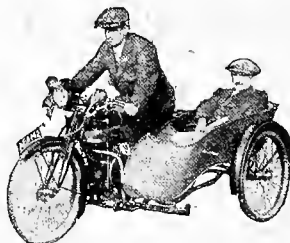
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**JUNO** Model A, £6 6s., or 11/8 month.

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" Coach-built, £10 10s., or 19/3 month.



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from £6 13s. 6d., or 12/3 month.

" The Tourist Model N, £11, or 20/2 month.

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## MOTOR CYCLES FOR SALE.

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**1914-15** Hobart, 2-stroke, owner in France, £16/16; also 2½ h.p. Moto-Revo, mag., almost new, £13; seen by appointment.—Bank House, 119, Beckingham Rd., Penze. [3343]

**HOBART**, 1916 models in stock; 2½ h.p. 2-speed 2-stroke, 35 gns.; your present machine can be taken as part payment.—Elce and Co., 15-16, Bishops-gate Av., Camomile St., E.C. [0481]

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**HUMBER**, 3½ h.p., sound machine, less mag.; £5/10, near offer.—45, Church Rd., Acton. [X8362]

**HUMBER** Twin, Tourist Trophy model, in first-class order; splendid value, £20.—Crypto, 14, Mortimer St., W. [X8265]

**1913** Humber Lightweight, little used; 13 gns., or exchange higher power.—21, Hawksworth Rd., Sheffield. [X8258]

**HUMBER**, 3½ h.p., chain drive; seen running; £6, or exchange with cash for Auto-Wheel.—31, Cressida Rd., Highgate. [4331]

**1914** 2½ h.p. 3-speed Clutch Model Twin-cyl. Humber, perfect; cash needed; £23.—Box L1,222, c/o The Motor Cycle. [4313]

**HUMBER**, 3½ h.p., 3-speed Sturmev-Archer, lamp, horn, perfect order; £35.—Castle Motor Co., Ltd., Showroom, Kidderminster. [X8114]

**1913** 2½ h.p. Humber, Besch, B. and B. Dunlops, tyres, belt new, light spares, tube and belt, all like new; £17.—F. Field, Lickey End P.O., Bromsgrove. [X8341]

**HUMBER**, late 1911, 3½ h.p., 2-speed, new 26x2½, Palmer tyre, Montgomery torpedo cane sidecar, lamps and horn; £20.—The Premier Motor Co., Aston Rd., Birmingham. [4470]

**3½ h.p.** Humber and Sidecar, 2-speed gear, free engine, £2 just overhauled, re-bored, new piston, Pedley belt, adjustable pulley, and tyres, thorough good running order; £32.—George, 2, Woodside Parade, N. Finchley. [X7907]

**HUMBER**, late 1912, 3½ h.p., 2-speed, free, new cylinder, piston, tyres, etc., in excellent condition; also few sundries; owner no use for same; £27/10.—E. G. Humphries, jun., 137, Evesham St., Redditch. [X7876]

## Indian.

**INDIAN**, new 1916 5 h.p. model in stock; no waiting.—Moss, Wem. [X8330]

**INDIAN**, 1914½, T.T., 2 speeds, free engine, and clutch model; £38.—H., 182, Green St., Forest Gate. [X8287]

**7-9 h.p.** Spring Flame Indian, with sidecar, first-class condition; cheap.—Apply, Box 461, G.P.O., Manchester. [4419]

**INDIAN** M.C. and Sidecar, 1915, 5-6 h.p., new 4 months ago; £60.—Seen by appointment, 248, Up-laud Rd., Dulwich. [4262]

**INDIAN**, 1915, 4 h.p., 3-speed, hand-foot clutch, new condition, complete; £48.—Vesuger, Elm Lodge, Quea's Rd., Teddington. [X7912]

**INDIAN**, 7-9 h.p. road racing model, 1915, as good as new, had little use; £53; with Swan sporting sidecar, £62.—Ernest Metcalfe, Romford. [4210]

**1915** Indian, 5 h.p., with Phoenix 1916 racing pattern sidecar to match, all in perfect order; £63.—Salter, 46, Burgess Rd., East Ham, E. [4414]

**INDIAN**, 1913, 7 h.p., 2-speed, with coachbuilt sidecar, in good condition and perfect order; £40.—Kimber's Garage, Albert Rd., Devonport. [4434]

**INDIAN**, 1914 7½ p. Coachbuilt Combination, 2 speeds, kick starter, electrical equipment; £47.—P. J. Evans, John Bright St., Birmingham. [X8318]

**INDIAN** 1913 Road Racer, 7-9 h.p., clutch, T.T. bars, Senspray carburettor, very fast and sound; £32.—Elce and Co., 15-16, Bishops-gate Av., Camomile St., E.C. [0492]

**INDIAN** Combination, late 1914, 7-9 h.p., 2 speeds, clutch, kick start, speedometer, just overhauled; £53.—Moore, School Villa, Market St., Craven Arms Salop. [X8324]

**1914** Hendee Special Combination, first-class condition; £55, cost £96; exchange 1914 Douglas and cash.—Richardson, 81, Finborough Rd., S. Kensington. [4302]

**INDIAN**, late 1915 model, 5 h.p., 3-speed, T.T. bars, very little used, and in splendid condition; price, cash, £52, or deposit £14/4 and 12 payments of 71/8.—Seen at Juno Showrooms, 248, Bishops-gate, London. [4381]

**INDIANS**, model B £70, model F Powerplus £90, and C Powerplus £75; also sidecars to suit; exchanges; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4453]

**1914** 7-9 h.p. Indian Road Racer, clutch model, in excellent condition, good speedometer, lamps, horn, and tyres, one tyre new; £32, no offers; on view Monmouth; owner at Front.—Box L1,249, c/o The Motor Cycle. [4377]

**INDIAN**, 7-9 h.p., late 1914, 2-speed, clutch, with sidecar (cost £20), electric head, tail lamp, and horn, acetylene sidecar lamp, tyres perfect all round, machine just been overhauled, speedometer, run 2,368 miles; £52/10.—Norton, Newtown. [4493]

## MOTOR CYCLES FOR SALE.

## Indian.

1915 Indian, 7-h.p., 3-speed, kick starter, electric lights, horn, 2 accumulators, speedometer, coach-built 16 in. sidecar, screen, hood, side curtains, 2,000 mileage, original tyres hardly worn, perfect order; cost £118, sacrifice £68; owner ordered France.—Staple, South Camp, A.S.C., Warminster. [X7964]

INDIANS in Stock.—Latest models, Power Plus combinations, sporting Power Plus 3 speeds models, standard 7-h.p. overhead inlet combinations, with lighting set, the famous 5-h.p. 3-speed double-purpose mount and 7-h.p. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [4512]

1912 7-h.p. C.M. Blue Indian Combination, under-shung sidecar, spare tyre, accessories, everything in perfect condition, as new; £32, or without sidecar, or exchange for 1914 combination, part spot cash; seen 7 to 8 p.m., or ring up 4586 Hamstead.—Emile, 8, Golden's Green Parade, Golden's Green, N.W. [4021]

THE Pick of the Bunch.—Genuine guaranteed 1914 Indian 7-h.p. combination, 2 speeds, free, clutch, electric lighting and horn, stormproof apron for sidecar, 28x3 tyres, 2 brand new, starts instantly, enamel and plating splendid; must sell instantly; first cheque for £48 for the lot secures it.—H. Millard, Esq., Chesterfield. [X8231]

## Ivy.

IVY 2-stroke, new; £28, or nearest offer.—Ellis Manning, Knaflon, Ellesmere. [X8289]

## Ixon.

IXION, 2-speed, footboards; immediate delivery; exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [4396]

## James.

JAMES No. 6 Combinations in stock; no waiting.—Colmore Depot, 261, Deansgate, Manchester. [3655]

JAMES, 4 1/2 h.p., 3 speeds, kick-starter, brand new, shop-soiled only; list £66/5, accept 60 gns.—J. Evans, John Bright St., Birmingham. [4511]

JAMES Combination, 3-speed countershaft, head light, speedometer, 2 1/2 in. tyres, tools, spares; owner bought car; £45, or near offer.—Collins, Langland, Swansea. [X7894]

JAMES, 4 1/2 h.p., 3-speed countershaft and clutch, had little use, with lamps and all accessories, and case sidecar; owner called up; £42.—Collyer, 286, High Rd., Wood Green, N. [X7647]

JAMES 1915 Big Single, Canoelet sidecar, delivered August, 3-speed countershaft, chain drive, speedometer, all accessories, recently overhauled by makers; £56, or near; trial—136, Burnt Ash Hill, Lee, S.E. [4411]

4 1/2 h.p. James, 3-speed gear, chain drive, and countershaft model, fitted with handsome coachbuilt sidecar, and all accessories; the combination complete 60 gns., guaranteed.—Wauchope's, 9, Shoe Lane, London. [X7955]

## J.A.P.

6 h.p. J.A.P., 1914, T.T., very fast, 4 to 70 m.p.h.; £32/10, or exchange for sidecar outfit.—White, Brant, 10, Cecil Rd., Colindale, Hendon. [4307]

4 h.p. J.A.P. Shop-soiled Engine, Bosch water-tight magneto, complete, and Binks carburetter; £18.—Sands, Epping New Rd., Buckhurst Hill, Essex. [4213]

1912 8 h.p. J.A.P. Zenith-Gradua and sidecar, heavy Dunlop and Palmer cord, both new, engines better than new; bargain, £34.—Chalkley, 31, Carlton Rd., New Southgate. [4297]

## J.H.

J.H., 3 1/2 h.p. twin M.A.G., 3-speed gear box; immediate delivery, exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [4400]

## J.E.S.

J.E.S. in B.S.A. cycle, perfect running order, only done 500 miles; £13.—Piper, Liskeard. [4480]

J.E.S., nearly new, in Swift 2-speed cycle, Dunlops; £10/15.—Herridge, Hambleton, Bucks. [X7914]

J.E.S. Auxiliary, with Enfield bicycle, excellent condition; £12, or thereabouts.—Newman, 130, Kingston Rd., Teddington. [4336]

## Lea-Francis

3 1/2 h.p. Lea-Francis, J.A.P. twin, 2 speeds, excellent condition; £35.—129, Bartholomew St., Newbury. [X8312]

LEA-FRANCIS, 1914, 3 1/2 h.p. twin, 2-speed, hand and foot clutch, in first-class condition; any trial; £38.—Ernest Metcalfe, Romford. [4207]

LEA-FRANCIS 3 1/2 h.p. Twin, 2-speed, kick starter, and smart coach sidecar, condition as new; price 36 gns., or near offer.—Ellis, 310, Brockley Rd., S.E. [3426]

LEA-FRANCIS, 1915, 3 1/2 h.p. twin, Bosch, 2 speeds, countershaft, all chain, kick starter, T.T. bars; £40, lowest; any trial.—Brendan, Beechwood Av., Thornton Heath. [0749]

## Levis.

LEVIS, new 1916 Popular model in stock, no waiting.—Moss, Weim. [X8331]

LEVIS Popular, or new model E; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0764]

LEVIS, 1916, 2 1/2 h.p., 2-speed, free engine, done 400 miles, good condition; owner enlisted, gone abroad.—Evans, Front Terrace, Newtown. [X8112]

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1913 7 h.p. INDIAN and Sidecar	50 0	15 0	62/8
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1913 Lady's DOUGLAS, 2-speed	39 0	—	—
1914 3 1/2 h.p. SUNBEAM, 3-speed, and Sidecar	65 0	25 0	71/3
1914 4-5 h.p. ZENITH	42 0	12 0	53/9
1914 3 1/2 h.p. SUNBEAM	46 10	—	—
1915 2 1/2 h.p. ALLDAYS and Sidecar	30 0	—	—
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## MOTOR CYCLES FOR SALE.

## Levis.

LEVIS 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents. Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. 'Phone: 1432 Regent. [0711]

1915 2 1/2 h.p. Levis, 2-stroke, excellent tyres, 2 lamp sets, mechanical horn, 2 toolboxes, all spares, really good condition; £22, inclusive.—Robinson's Garage, Green St., Cambridge. [4445]

LEVISIES, 1916 models, actually in stock; also three Populars, second-hand, from £21; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4454]

LATE 1915 Levis Popular, excellent condition, marvellous hill-climber, all accessories, new back tyre, front tyre sound condition, very low petrol consumption; £25/10.—Lieut. Puckle, Porton Barracks, Gosport, Hants. [4462]

## Lincoln-Elk.

LINCOLN-ELK Coachbuilt Combination, 1913-14, 4-h.p., countershaft 2-speed, F.E., kick start, beautiful turnout; sacrifice £28.—Speedley, 45, Church Rd., Acton. [X8361]

## Martin

MARTIN-J.A.P., 1913, 2 1/2 h.p., overhead valves, Bosch, forced feed Amac, speedometer, T.T. bars, all accessories, perfect order; £26.—Vincent Motor Co., Bees Lane, Rugeley. [X7315]

MARTIN-J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 3-speed countershaft gear £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [0760]

## Matchless.

6 h.p. Matchless and sidecar, good condition; £40, or nearest.—Franklin, Draper, Kingston. [4325]

MATCHLESS, Villiers, with £12 coach sidecar, new; £30, lowest.—Mrs. Kipps, Eastry, Kent. [X7699]

MATCHLESS, 1914, 8-h.p. twin, with sidecar, in splendid order, Mabon clutch; £40.—Ernest Metcalfe, Romford. [4209]

1914 Matchless, 8-10-h.p. J.A.P. engine, 2-cyl., in perfect condition, ridden by Collier in tests; price £42.—Tait, 46, Bede St., Sunderland. [X8106]

MATCHLESS, 6-h.p., overhead valve, 7-speed, new belt, and good tyres, in perfect condition, Canoelet sidecar; £50, or near offer.—Box 348, c/o The Motor Cycle. [X8355]

1912-13 Matchless 6-h.p. Twin J.A.P. with 19 gns. Bramble coachbuilt sidecar, fitted with screen, etc. complete with lamps, etc.; bargain, 43 gns. Lightweight wanted.—Newham, 223, Hammersmith Rd., W. [4432]

MATCHLESS-J.A.P. 1913 Combination, 8-h.p., 2-speed, Amac carburetter, double belt drive, 2 new Pedley belts, new Hutellinson tyres, Cowey speedometer, P. and H. lamp, excellent condition, very fast and powerful; owner at Front; arrange trial; price, 60 gns.—Dr. Packman, Rochester. [4474]

## Minerva.

MINERVA, 3 1/2 h.p., U.H. mag., running order; £14.—Coldecutt, Chapel Lane, Wilmslow. [X8338]

MINERVA, 2 1/2 h.p., lightweight, Amac, overhauled; £5, offer.—87, New Park Rd., Brixton. [4301]

MINERVA, 3 1/2 h.p. and sidecar, B.S.A. frame, B. and B. and lin. Whittle belt, good condition; £12.—69, Belgrave Rd., Walthamstow, E. [4499]

MINERVA, m.o.v., Amac, footboards, adjustable pulley, spring forks, Michelin, K.T. mag., very fast and reliable, would deliver machine within 50 miles; price £12/15, no offers.—James, 14, School Lane, Leyland. [4203]

## Motosacoche.

2 1/2 h.p. 1913 Motosacoche, variable gear, perfect order; £12.—Solter, Dry Sandford, Abingdon. [4477]

1915 3 1/2 h.p. Motosacoche and sidecar, lighting set, 2 speeds, kick starter, new condition; £50.—84, Greenside Rd., Croydon. [4204]

MOTOSACOCHE, in good condition; 8 gns., great bargain.—Julian's, Broad St., Reading. Biggest motor cycle and light car dealers in the South. 'Phone: 1024. [X557]

MOTOSACOCHE, 2 1/2 h.p., 1913, Multi gear, free engine, in excellent order, Whittle belt, Bosch mag., good tyres; any trial; approval, deposit; must sell; £15.—J. Coe, Gardiner, Cherrington Rd., Cambridge. [X7981]

## New Hudson.

NEW Hudson, 1912 1/2, 4-h.p., 3-speed clutch, excellent condition; price £23.—Spranklin, Acre Lane, S.W. [4413]

1916 New Hudson, 2-strokes, three model C's in stock.—D. J. Shepherd and Co., Enfield Highway. [4390]

NEW Hudson, 1915, 2-stroke, hardly soiled, single speed; bargain, £25.—Elce and Co., 15-16, Bishnongate Av., Camomile St., E.C. [0598]

1915 2 1/2 h.p. 2-stroke 2-speed New Hudson, machine and tyres in excellent condition; £26.—Lt. Bacher, Royal Flying Corps, Telford, Norfolk. [X8257]

NEW Hudson, 2-stroke, 3-speed countershaft, 1915, £28/10, two lamps and generators, born; Velocette, 2-speed countershaft, 24, lamps, horn.—Box 351, c/o The Motor Cycle. [X8274]

## MOTOR CYCLES FOR SALE.

## New Hudson.

NEW Hudson, 1915, 2½ h.p., single-cyl., 2-stroke lightweight, countershaft 2-speed, lamps, horn, spares, condition as new; £35.—The Premier Motor Co., Aston Rd., Birmingham. [4468]

NEW Hudson 3½ h.p. Combination, 1912, 3 speeds, Mark VI, perfect order, lamps, speedometer, horn, h.b.c. clutch, new tyres; £32/10.—Duffield, 70, Abington Av., Northampton. [X7875]

NEW Hudson Combination, big six, 1916 model, done 1,000 miles, 3 spare tyres and tubes (new), spare chain, belt, and valve, 3 lamps, storm cover, mat, petrol carrier, extra set of tools, and Klaxon horn; bargain, £75, cost £107.—Sergeant-Major Petch, Royal Flying Corps, Shoreham-by-Sea. [4232]

## New Imperial.

NEW Imperial-Jap, 1916 models in stock; £38 and £44/8.—Crow Bros., Guildford. [3967]

IMPERIAL-J.A.P., 1915, 2 speeds, lamps, etc.; £25.—11, Luna Rd., Woodville Rd., Thornton Heath. [4518]

NEW Imperial, light tourist, immediate delivery; cash or easy terms.—Referee Cycle Co., 332, High Holborn. 10765

1915 New Imperial-Jap, 2-speed, accessories; 26 gns.—Troward, Heathurst, Vale of Health, Hampstead. [4485]

NEW Imperial, 2½ h.p., December, 1915, 2-speed, perfect, unscratched; 26 gns.—32, Comeragh Rd., West Kensington. [4478]

1915½ New Imperial, 2½ h.p., J.A.P. engine, 2 speeds, Miller lamp, set, etc., splendid condition; 25 gns.—Alfred Proctor, Chesham. [X7919]

1915½ New Imperial-Jap, not ridden last 6 months, excellent condition, engine better than new; £28.—Brodey, 88, Clements Rd., East Ham. [4193]

NEW Imperials, latest models in stock; 2-speed, also kick-starter hand-controlled clutch models.—P. J. Evans, John Bright St., Birmingham. [4509]

1916 New Imperial, 2½ h.p., J.A.P., 2 speeds, E.I.C. variable mag., actually in stock, £37/18; one other, done 20 miles, £35/10.—Alfred Proctor, Chesham. [X7920]

NEW Imperial-Jap, 2½ h.p., 2-speed, variable ignition, £38; also 2-speed, with clutch, and kick-starter, £44/8; actually in stock; easy payments 2% only extra.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [4505]

## New Ryder.

1915 2½ h.p. Ryder, J.A.P. 2-speed, and accessories; £25.—223, High Rd., Kilburn. [4224]

NEW Ryder-Jap, 2½ h.p., 2-speed, ridden 80 miles; cost with accessories £38 accept 27 gns.—Troward, Heathurst, Vale of Health, Hampstead. [4486]

## Norton.

NORTONS in Stock.—All models for immediate delivery, including latest T.T. model with countershaft gear, De Luxe combinations, and H.R.S., also T.T. models.—P. J. Evans, John Bright St., Birmingham. [4515]

NORTON Motor Cycles from £52/10 to £85; early delivery; deferred terms from one-quarter down, balance by twelve monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Norton motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4059]

## N.S.U.

1912 2½ h.p. Twin, N.S.U. undergeared pulley, o.h.v., perfect condition; £16, offers.—Ginns, Carlton, Carlisle. [4196]

6 h.p. N.S.U., new, 2-speed gear, Cowey speedometer, P. and H. lamps, spring forks, coachbuilt sidecar, in good condition; £23/10.—26, Balfour Rd., Dover. [4426]

## N.U.T.

N.U.T., 2½ h.p., T.T. model, very late 1915, brand new; list price £68/9, offered for £65 cash; easy payments 2% only extra.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [4506]

## Omega.

OMEGA, 3 h.p., Oct., 1915, 2-stroke, 2 speeds, speedometer, lamps, horn, condition as new; £30, or near offer.—3, Carson Rd., W. Dulwich. [4235]

OMEGA 2-stroke Motor Cycles, £31/10 to £31/16; early delivery; deferred terms from one-quarter down, balance by 12 monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Omega motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4056]



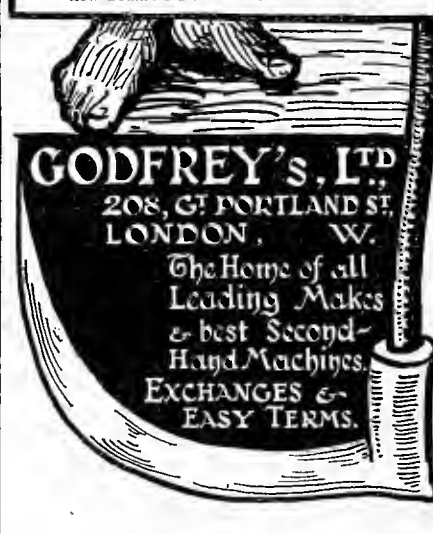
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1915 2½ h.p. NEW IMPERIAL, 2-speed, variable ignition, accessories .....	£32
1913 3½ h.p. SCOTT .....	£38
Or with coach-built Sidecar .....	£45
1913 3½ h.p. P. & M., 2-speed, Arrow coach- built Sidecar, and accessories .....	£42
1915 7 h.p. INDIAN road racer, khaki colour .....	£45
1915 2½ h.p. DOUGLAS, 3-speed .....	£45
1915 3½ h.p. HUMBER, 3-speed, kick starter .....	£48
Or with Millford coach-built Sidecar .....	£59
1914 7 h.p. INDIAN, 2-speed, horn, electrically equipped, and speedometer .....	£48
1915 7 h.p. INDIAN road racer .....	£52
1915 7 h.p. INDIAN road racer .....	£52
1914 7 h.p. HENDEE Special, 2-speed gear, electrically equipped .....	£55
Or with coach-built Sidecar .....	£70
1915 5 h.p. INDIAN, 3-sp., lamp, generator, and horn .....	£56
1915 5 h.p. INDIAN, 3-sp., kick starter, and Spartan horn .....	£58
1915 7 h.p. INDIAN, 3-speed, kick starter .....	£60
Or with coach-built Sidecar .....	£78
1915 7 h.p. INDIAN, 3-speed, kick starter, electrically equipped, and speedometer .....	£64
1915 7 h.p. INDIAN, 3-sp., kick starter, and Indian coach-built Sidecar .....	£75
1915 7 h.p. MATCHLESS, M.A.G. engine, 3-speed gear, kick starter, and Matchless coach-built Sidecar, complete with Lucas dynamo set .....	£85
1916 7 h.p. INDIAN, 3-speed, kick starter, semi-T.T. bars, Lucas electric lamps, Corbin-Brown speedometer, and brand new Bramble Sidecar .....	£90



## MOTOR CYCLES FOR SALE.

## O.K.

O.K., 2½ h.p., 1915, 2-speed, perfect; bargain, £25.—Simpson, Chemist, Ilstock. [X7739]

O.K., 1915 Junior, been 500 miles, 2 speeds; £26.—65a, Rosendale Rd., Dulwich. [X7972]

1915 O.K., 2½ h.p., mark VI. model 2-speed gear, countershaft, tyres engine excellent, as new; £26/10.—Robinson's Garage, Green St., Cambridge. [4440]

## P. and M.

1911 P. and M., 2-speed; bargain, must sell, £20.—8, Mayfield Place, Eastbourne. [4251]

P. and M., Montgomery, everything guaranteed; giving up; £30.—20, Rozel Rd., Clapham. [4273]

PHILON-MOORE 1914½ Combination, run 1,000 miles, equal new; £52/10.—Steven's, Goxhill, Lincs. [X7892]

P. and M., 1913, 2-speed, new condition, and coach-built sidecar; £38, bargain.—29, St. Leonard's St., Bow, E. Seen any time. [4280]

3½ h.p. P. and M., overhauled, take sidecar anywhere, £30, bargain, £30; N.S.U. gear, new, £6/6.—Rowland Dakin, Wombwell, Yorks. [X7891]

P. and M., 1914, 3½ h.p., 2 speeds, clutch and starter, exceptionally good condition; £38.—P. J. Evans, John Bright St., Birmingham. [X8319]

1914 3½ h.p. P. and M., 2-speed, wicker sidecar, in perfect condition; cash or easy terms; £47/10.—R. E. Jones (Garages), Ltd., Swansea. [0721]

## Precision.

PRECISION, 3½ h.p. Combination, 3-speed, clutch; £35.—Stanley, 30, Canterbury Rd., Kilburn. [4230]

## Premier.

PREMIER, 3½ h.p., 3 speeds clutch, late model, fine machine; £25.—Speelchay, 45, Church Rd., Acton. [X3360]

1912 3½ h.p. Premier, free engine, 2-speed, good condition; £23, or near offer.—172, Whipplendell Rd., Watford. [4333]

LATE 1915 Premier, 3½ h.p., 3-speed countershaft, only run 150 miles, not even shop-soiled; sacrifice £53, or exchange 4 h.p. A.J.S., 1916.—Howard, Stationer, Bawtry. [4219]

3½ h.p. Premier, 1914, 3 speeds, coachbuilt sidecar; 32 owner in B.E.F. since August, 1914; running order, little used; £50.—Box L1,258, c/o The Motor Cycle. [4388]

PREMIER, 1914, 3½ h.p., 2-speed countershaft, 1915 coach sidecar, handle starter, lamps, and horn, all new tyres; belt, cylinder, piston, engine sprocket, and chain; £45.—Box 278, c/o The Motor Cycle. [X6868]

## Quadrant.

QUADRANT Combination, latest 1916 model, in stock; immediate delivery; exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [4397]

## Radco.

NEW Radco, 2½ h.p., 2-stroke, Palmer tyres; £25.—188, High Rd., Ilford. [X0751]

RADCO, 2½ h.p., 2-stroke lightweight, 24in. wheels, Palmer tyres, brand new machine, cash £25, or deposit £7/10 and 12 payments of 33/4.—Juno Showrooms, 248, Bishopsgate, London. [4382]

## Rex.

REX, 1910, good running order, lamps; £11/5.—Wilson, 72, High St., Ilstock, Leicester. [X7966]

3½ h.p. Rex, 2-speed gear, Bosch, spring forks, £12; 2 sidecar, £2; offers.—49, High St., Kingston. [X8104]

REX, late 1913, twin, 6 h.p., 2-speed, free engine, coachbuilt sidecar.—Stone, 158, Shaftesbury Av., London, W.C. [4267]

5 h.p. Rex, 2-speed, free engine, handle start, Mills-Fulford wicker sidecar; 21 gns.—90, Albion Rd., Stoke Newington. [4245]

1912 6 h.p. Twin Rex, handle start, splendid condition; £18, bargain.—29, St. Leonard's St., Bow, E. Seen any time. [4281]

1913 6 h.p. Rex, 2 speeds, free engine, and sidecar, perfect running order; £27.—Seen at 335, Bethnal Green Rd., N.E. [4206]

REX, 5 h.p., and sidecar, mag., B.S.A. free engine, handle start, in good running order; £20.—Box 333, c/o The Motor Cycle. [X7918]

1914 Rex, 6 h.p., 2-speed, free, new 3in. Stelastic tyres, £20 sidecar, machine hardly used, spares; £43.—29, Morley Rd., Leyton. [4412]

REX Sidetta, 6 h.p., 1913, 2-speed, lamp, generator, tyres new condition, good running order; £33.—Lyon Garage, Emberton, Newport Pagnell. (D) [X8253]

REX, 5 h.p., 2 speeds, free engine, Bosch mag., good condition; must be sold; £22, or nearest offer.—J. Richards, 62, Tower Bridge Rd., London, S.E. [4328]

EASTER Egg.—Rex, 5 h.p. twin, and sidecar, Bosch mag., Senspray, in really nice order throughout; quick sale £16/10.—3, The Mews, Victoria Rd., Clapham, S.W. [4252]

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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20, Tudor Street, London, E.C.

Telegrams: "Cyclist, Fleet, London."  
Telephone: 2848 City (five lines).

## Editorial Offices:

Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
Telephone: 10 Coventry (five lines).

## Northern Offices:

199, Deansgate, Manchester.

Telegrams: "Hiffe, Manchester."  
Telephone: 620 City.

Subscription Rates: Home, 6s. 6d.; all countries abroad, 10s. 10d. per annum.

UNITED STATES—The International News Agency, New York. CANADA—Toronto News Co., Ltd., Toronto; Montreal News Co., Ltd., Montreal; Winnipeg News Co., Winnipeg; British Columbia News Co., Vancouver; Gordon & Gotch, Ltd., 132, Bay Street, Toronto.  
AUSTRALIA—Gordon & Gotch, Ltd., Melbourne (Victoria), Sydney (N.S.W.), Brisbane (Queensland), Adelaide (S.A.), Perth (W.A.), and Launceston (Tasmania).  
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## The Upkeep of the Roads.

THE House of Lords recently added a most commendable clause to the Local Government (Emergency Provisions) Bill to the effect that no new routes for motor omnibuses and other vehicles of a like nature should be opened up except with the consent of the Local Government Board or the local authorities. The object is to obtain contributions from these very destructive vehicles towards the maintenance of the roads over which they propose to run; for it gives to the local authorities the power of making some arrangement with the omnibus company for the payment of a fair contribution for the upkeep of the roads. It is not intended that the new clause should interfere in any way with commercial vehicles, but to such as ply for hire—omnibuses, charrs-à-bancs, stage coaches, waggonettes, etc.—nor will it affect those vehicles which are running at present.

It seems reasonable that heavy vehicles of this nature, which do a very considerable amount of damage to the roads, and also take up a large amount of room, should do their part in maintaining the roads in fair condition. Already municipal authorities are paying a small rate per omnibus-mile for the privilege of running their motor omnibuses outside their own district, and on the Great West Road, London, under the Middlesex C.C., the same conditions apply.

The tax on motor omnibuses is relatively small, and the companies obtain a rebate on the petrol tax and pay a special price for their petrol. Therefore, we think, they have no cause for complaint if they are compelled to do something towards the repair of the roads which they destroy so rapidly.

While on the subject of motor omnibuses *et hoc genus omne*, we should like to enquire why it is that, when motorists are being urged by placard and otherwise to abstain from pleasure motoring, these vehicles are still making pleasure trips in all directions—to race meetings, for example, and all-day pleasure jaunts. It may

be urged that the worker is entitled to a trip in the fresh air—granted, but if he be the owner of a motor cycle he can obtain it at less cost on his own machine than in a public conveyance.

## Engine Balance.

A SUBJECT of paramount importance which has not had sufficient expert attention devoted to it is the question of the balance of engines. That this is so is all the more surprising as a single-cylinder engine, which is the most common type used on motor cycles, can never be perfectly balanced, and consequently the nearest approach to that desideratum should always be sought after. In this issue we commence a series of very practical articles on the subject of engine balance, to which we direct notice. The problem is a complex one admittedly, but one incentive to devote attention to more perfectly balanced prime movers is the rapidly deteriorating state of our roads. Spring frames will do a lot to minimise road vibration, but with the finest spring frame ever produced an imperfectly balanced engine will cause an objectionable tremor to the rider's hands, feet, and backbone.

As proof that much good can accrue from a complete examination of the question, one may naturally cite the fact that certain makes of single-cylinder engines on the market to-day will turn over at widely varying speeds with an absence of tremor to the handle-bars and saddle, whereas others set every part of the machine dithering, and at certain critical speeds convey to the rider's wrists a rapid series of vibrations akin to an alternating current battery. This excessive vibration is neither good for the machines nor the riders, as, apart from the important factor of discomfort, it shakes loose every fitting on the machines, and in course of time leads to fractured petrol pipes, leaky tanks, broken frames, or other similar troubles. Happily such engines are in the minority, but they do exist, as we know full well.





BY

LXION

### Motor Attachments.

Mr. J. E. Smith evidently overlooks the fact that I paid a tribute to his J.E.S. motor attachment a year or two ago. But he rather gives away the point of his present complaint when he premises that the front forks of a push bicycle should be strengthened before fitting one of his engines, and, further, that the push bicycle should be at least of "medium" quality. I have no criticisms to offer of honest manufacturers who advise their clients to strengthen the forks of push bicycles and to pay a price which is compatible with decent materials and workmanship. Dishonesty begins when vendors assert either that their attachment will be satisfactory when it is not and cannot be; or when they say that any push bicycle will be safe with an engine attached to it. Mr. Smith has not committed either of these misdemeanours.

### Clutch Control Design.

I don't know whether Mr. Batten and myself are fundamentally opposed, or whether he has never sampled some of the truly abominable handle-bar clutch controls which it has been my miserable fate to ride in journalistic tests. Anyhow, he plumps for h.b. control, good if possible, but bad in preference to a pedal. My secret preference is for the dual control, when obtainable; failing that, a good h.b. control; failing that, a pedal control. (Please notice, readers, how we are progressing; it is barely three years since I took a pedal clutch control which walked round the down tube whenever you put your toe on it as quite a natural and pardonable occurrence!) My present heavyweight has interconnected h.b. and pedal control. I find I always use the h.b. control for starting purposes, and eke for the freak stunts of which Mr. Batten writes, but I always use the pedal for gear changing. You can operate either control with no more force than resides in a (rather middle-aged) little finger.

### Jack of All Trades.

For a Government department to tackle the taxation of a highly specialised industry and pastime is about as foolish as it would be for the Triumph people to consult me about getting an extra 2 h.p. out of their standard engine dimensions. But one fails to hear that the Exchequer people have called in any expert advice prior to framing their new taxes. It would surely be the simplest thing in the world for a Chancellor to summon a small committee of motor cycle experts, including designers, importers, financiers, and, above all, journalists, who have no reason to be anything but impartial as between one type and another, or between imports and home-made stuff. Such a committee could be given its terms of reference. For example, "to prepare a scheme which

shall (a), reduce motor cycling by 50% for the duration of the war, (b) prevent highly paid munition workers from squandering their earnings, (c) raise £100,000 for the Exchequer by December 31st, 1916, (d) fall as fairly as possible on all the taxpayers involved, (e) penalise British manufacturers as lightly as possible, (f) reduce or stop imports, (g) impose no arbitrary handicaps on the technical items of design." I write, of course, in entire ignorance as to the exact motives which dominated the Chancellor in his recent proposals, and I am perfectly willing to suppose that revenue was his one and only consideration. But I cannot believe that any genuinely qualified persons were consulted in the framing of the new imposts; and for an outside observer to manipulate our highly complex conditions without blundering would be as great a miracle as for me to revivify an insolvent poultry farm. Germany's efficiency may be overrated in many ways, but at least the Germans do not hesitate to employ specialists wherever there is the least chance that a specialist may emphasise facts which a layman could easily overlook. I hope that after the war the whole question of motor taxation will be revised after due reference to an advisory committee of men thoroughly conversant with its technical, financial, and other aspects. The main effect of the motor cycle taxes will be to administer an artificial and arbitrary stimulus to small single-cylinder engines, and as hard facts were already booming these engines, I don't know that the stimulus will be wholly bad. This is parallel to a similar process in the car world, where the already precocious light car is now undergoing intensive culture, under the dual influences of dear petrol and high taxation. In both spheres alike, the ultra-efficient engine of small cubical capacity is being "forced," as a gardener would put it; in both spheres many surprised users of other types suffer hardship.

### Average Speed.

I see a correspondent invites me to declare my notions on the vexed question of what average speed is possible on British roads. It is useless to cite personal opinions, but he should take the End-to-end record as a standard test. It covers a distance of roughly 900 miles, including some first-class speed stretches, but also many miles of bad going, and more miles of roads where the surface may be good, but the conditions are all against sustained speed. In spite of these adverse factors, the existing record stands at well over 30 m.p.h. In addition it must be remembered that the time is gross, not nett; it includes every conceivable kind of stoppage, and is registered by a rider who is inevitably far below par by the time his job is done. To my mind the record proves that a first-class rider who is fresh and well mounted can

**Occasional Commens.—**

easily average over 40 m.p.h. on selected roads for a short distance. It is perfectly safe and easy for any decent rider to average 30-35 m.p.h. over any decent roads in century trips. Shoals of men do it through the bulk of the average Six Days Trial course, and wait for half an hour or so outside controls until minimum time is up. I should say that the average fast riding motor cyclist keeps going at from thirty to thirty-two miles an hour on ordinary country roads; that the maintenance of a 30-32 m.p.h. gross average implies a strain which nobody ordinarily faces in pleasure riding; but that a good rider, if he were put to it, could maintain a *gross* average of 40 m.p.h. over decent roads without very great trouble. In touring work a gross average of 25 m.p.h. over a full summer day's run is probably as fast as is often achieved.

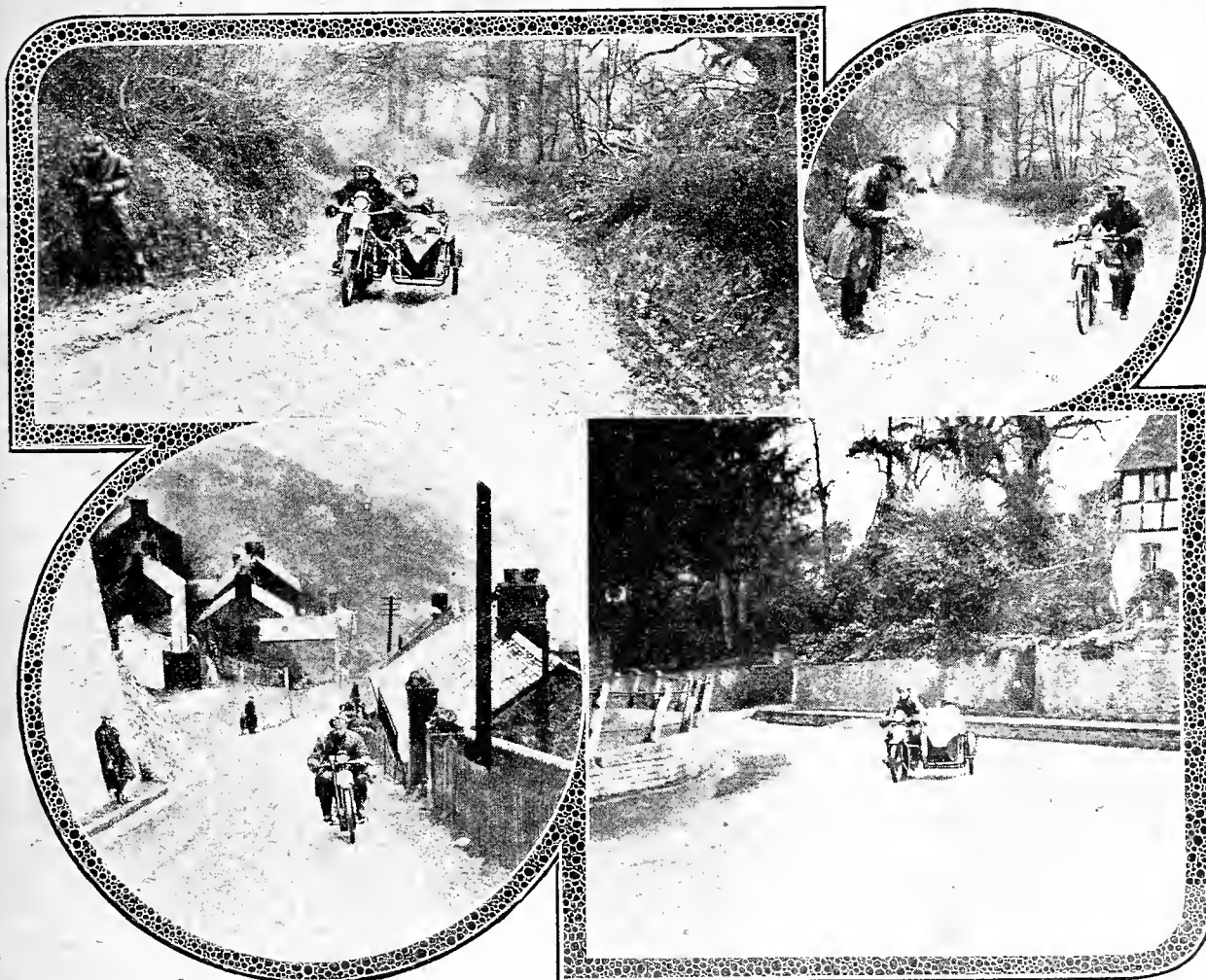
**For Example.**

Disbelief in the possibility of high averages is usually voiced by men whose machines are slow on hills, or

pick up badly. I am at present riding a machine which will do 40 m.p.h. anywhere, and if I suffered from the speed craze my average speed would be limited only by my willingness to take risks. It will do 40 m.p.h. on second gear up really bad hills; it will do 40 m.p.h. on third speed up moderately bad hills; and it will do 40 m.p.h. on fourth speed up gentle slopes. I could come very near a 40 m.p.h. average with this machine over good roads without ever exceeding 40 m.p.h. on the straight flat; and as the engine is good for 65 m.p.h. on the level, it is obviously child's play to beat a 40 m.p.h. average on this mount, provided one is fool enough to take certain risks, which I am not (at least, not in the ordinary way). Broadly speaking, I regard a 40 m.p.h. average as easily possible, but as clean against all common-sense; but it is only possible to a crack rider, who has a really first-class engine in perfect tune, and who knows how to make the best use of his lower gears, and is willing to take risks.

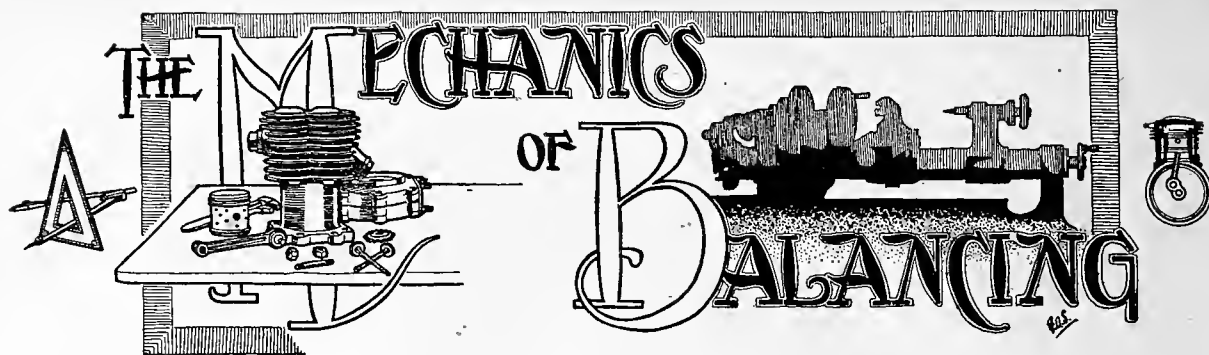
**EASTER MONDAY'S RELAXATION FOR SERVICE MEN AND MUNITION WORKERS.**

Scenes in the Birmingham M.C.C. Trial, reported in our last issue.



B. W. Harcourt (8 h.p. Rex-Jap sidecar) climbing Portway.  
T. B. Haddock (2½ h.p. Diamond) among the chimney pots on the Old Wyche.

Manual exercise on Portway.  
W. Heaton (4 h.p. A.J.S. sidecar) near Worcester.



By H. ADDISON, B.Sc., A.M.I.C.E.

SO much has been written on the subject of balancing motor cycle engines that it might be thought difficult to offer any further useful information on the question. Indeed, the writer hardly expects that what he has to say will add materially to the *practical* knowledge of the motor cyclist; the object of the present articles is rather to give a more or less scientific explanation of facts already pretty generally known, in the hope that a treatment of the subject on these lines will not be unwelcome to readers who wish to know the why and wherefore of everything connected with their pastime.

It has been felt, too, that the interesting discussions on this topic which arise from time to time in these pages receive little notice from the average reader on account of the forbidding-looking terms with which they bristle—"obliquity of the connecting rod," "unbalanced secondary force," and so on. As a matter of fact, there is nothing very formidable about such expressions; no profound knowledge of mathematics or applied mechanics is required in order to understand them, and, provided "commonsense" proofs and methods be accepted in place of rigid scientific ones, the whole subject can be quite simply explained.

### Rotating and Reciprocating Parts

The moving parts which have to be balanced are, of course, the piston, connecting rod, and crankshaft.

The piston, with its rings and gudgeon pin, has a purely reciprocating motion; the flywheels, crankshaft, etc., have solely a rotary motion; while the connecting rod partakes of both kinds of movement. For most practical purposes, however, the small end and upper half of the body of the rod may be regarded as reciprocating, while the big end and the lower half of the rod may be looked upon as rotating. Reducing the problem to its simplest form, then, we have to deal with one moving mass, which we will represent by *W*, travelling up and down along a path equal in length to the stroke of the engine, and with a second mass *M* revolving in a circle whose diameter is equal to the stroke (see fig. 1).

As a rule there is no difficulty in completely balancing the rotating mass *M*; all that is required is

to provide a balance weight diametrically opposite to the crank pin. If this weight is of the correct size, and is fixed at the proper radius, the centrifugal force exerted on it will exactly neutralise the centrifugal force set up in the revolving mass *M*, hence no disturbing effects tending to produce vibration can be transmitted to the motor cycle frame. We can, therefore, at once pass on to a much more troublesome problem.

### Balancing the Reciprocating Parts.

During the first half of each stroke the reciprocating mass *W* has to be started from rest and quickly accelerated, until at about mid-stroke its velocity is equal to the linear velocity of the crank pin; then it must be retarded so as to bring it to rest again at the end of the stroke. A rough calculation will show how rapidly these changes take place. In an engine running at 1,800 r.p.m., and having a stroke of 3 in. (76 mm.), the speed at which the piston moves along the cylinder at mid-stroke is sixteen miles per hour, and this speed is attained in 120th of a second after starting from rest. A motor cyclist would consider he was accelerating pretty smartly if his machine reached this velocity within, say, three or four whole seconds after a standing start.

In order to produce acceleration or retardation in the motion of a mass of matter, *i.e.*, to change its velocity, its inertia must be overcome by the application of a definite external force. Inertia simply means laziness; a body at rest tends to remain at rest—it is too lazy or inert to move of its own accord, and can only be set in motion by being pulled or pushed in the required direction. Similarly, when a body has acquired velocity, it is reluctant to come to a standstill; its speed can only be decreased or increased by the application of force. Naturally the greater the weight of the body, the greater will be the force that is required to effect this change of velocity, and an increase or decrease in the acceleration or retardation (*i.e.*, in the *rate of change* of velocity) can only be brought about by a corresponding increment or diminution in the external force.

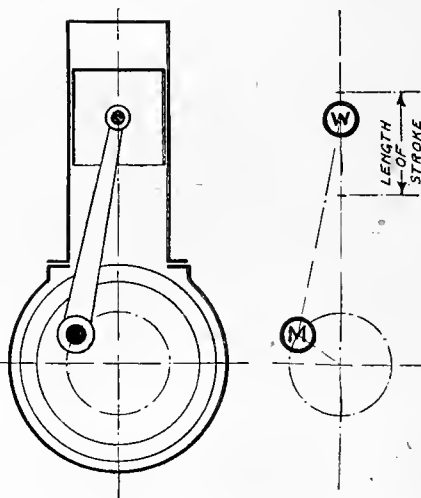


Fig. 1.

**The Mechanics of Balancing.—**

We have, therefore, to regard the moving mass  $W$  as offering a definite resistance to any change in its velocity; thus, when the velocity is increased during the first part of the down-stroke, the mass tends to "hang back," and so calls into play an *upward* force proportional to the acceleration. During the latter half of the down stroke the piston, by reason of the high velocity it acquired at mid-stroke, endeavours to descend into the crank case, and, as it is prevented from doing so, it exerts a *downward* force. This downward force continues during the first half of the up-stroke, for then the inertia of the reciprocating parts is opposing the upward acceleration that is impressed on them; while for the remainder of the up-stroke the parts press upward in their effort to maintain the velocity they attained at mid-stroke. To sum up, we see that during the upper half of each revolution an upward force is at work, tending to lift the motor cycle bodily off the ground, while during the lower half a downward force comes into play; it is, of course, the rapid alternation of these forces which produces that vibration which it is the object of balancing to minimise or eliminate.

**Obliquity of the Connecting Rod.**

In dealing with the force due to the inertia of the reciprocating parts, known as the "inertia force" or "acceleration pressure," the problem can be simplified if we temporarily neglect the obliquity (or angularity) of the connecting rod and assume the engine to have a rod of infinite length. Now, what exactly is meant by this term "obliquity of the connecting rod"? A glance at fig. 2 (ii.) should make the matter clear. When the crank is at position (1), and the piston is at the top of its stroke ( $a$ ), the connecting rod is parallel to, and in fact coincident with, the centre line of the engine. As the crank moves to position (2), and the piston to position ( $b$ ), the rod takes up an angle with the centre line, the angle increasing until the crank is horizontal; then the angularity diminishes until the rod again becomes parallel with its original position. This varying angularity has a perceptible disturbing effect on the inertia force, and so it is convenient to assume for the moment that the engine has an "infinitely long rod," in which case the effect would disappear, as the rod would always remain absolutely parallel to the centre line.

Unfortunately such a rod is a little too long to be represented on a diagram, so in fig. 2 (i.) a rod of finite length is shown, on the assumption that it moves parallel to itself; the motion of the piston will then be exactly the same as if the rod were of infinite length. Thus, when the crank successively occupies the positions 1, 2, 3, 4, and 5, the small end of the rod is imagined to move from  $a$  to  $B$ ,  $C$ ,  $d$ , and  $E$ , and the corresponding positions of the piston are  $a$ ,  $b$ ,  $c$ ,  $d$ , and  $e$ .

**How the Inertia Force Varies.**

In fig. 2 (i.) forces acting in an upward direction are laid off horizontally to the left, while downward forces are measured to the right. Commencing at the top of the stroke, the inertia force is represented by the length  $aa_1$ ; as the piston descends, the inertia force uniformly decreases—for example, at ( $b$ ) it has the value  $bb_1$ , until at mid-stroke ( $c$ ) the pressure is zero. During the remainder of the stroke the inertia force acts downwards, and increases uniformly in intensity until, at the bottom of the stroke ( $d$ ), it has the same value as at the top, i.e.,  $dd_1 = aa_1$ . On the up-stroke the sequence of operations is reversed—the downward inertia force decreases from  $dd_1$  at position ( $d$ ) to  $ee_1$  at position ( $e$ ), and to zero at ( $c$ ), after which it changes to an upward force, and increases again to its original value  $aa_1$ . As has been said, the forces represented in fig. 2 (i.) are only those which would theoretically be generated if the engine had an infinitely long rod; they are termed the "primary" inertia forces.

**Influence of the Connecting Rod.**

Hitherto we have assumed that when the crank is at, say, position (2), the corresponding position of the piston would be at ( $b$ ) (fig. 2 (i.)). Considering now the true state of affairs, and swinging the rod across into its actual position, we find that really the position of the piston is at ( $g$ ) and not at ( $b$ ). Similarly for position (5), on swinging the rod along the arc  $Ef$ , it is found that actually the piston is at ( $f$ ) instead of at ( $e$ ). The same reasoning holds good for other positions, and we can therefore say that if the obliquity of the rod is taken into account, the piston is always *lower* for a given crank position than would be the case were the angularity neglected.

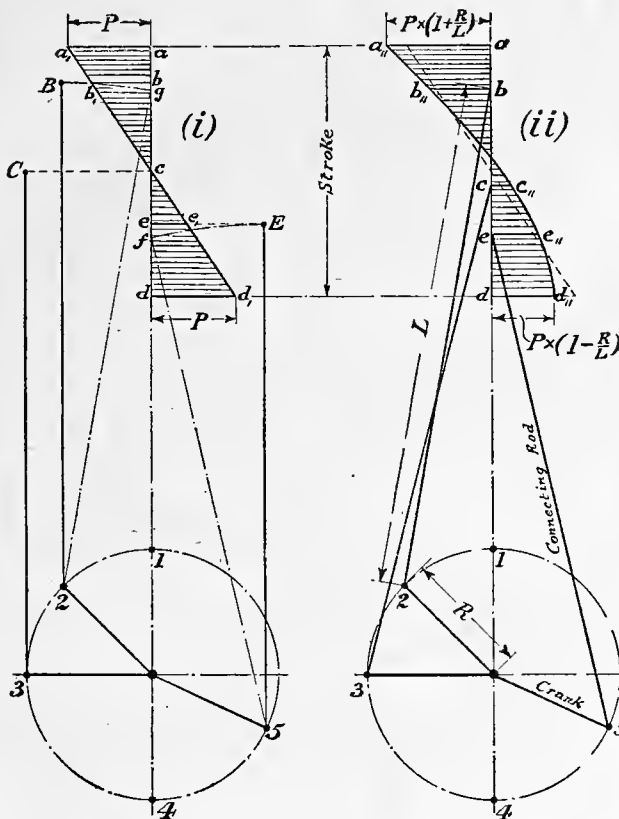


Fig. 2.



### The Mechanics of Balancing.—

The effect of this on the inertia force can be immediately deduced. With an infinitely long rod, during the period of time taken by the crank pin to travel from (1) to (2), the piston moves from (a) to (b). Actually, however, taking the obliquity into account, the distance moved is from (a) to (g) (fig. 2 (i.)), that is, the piston moves a *greater* distance in the *same* time. Since in each case the piston starts from rest, manifestly the average acceleration must be greater in the second case than in the first. On the other hand, the true distance traversed on the up stroke while the crank pin travels from (4) to (5) is *df* as against *de*, hence, the actual acceleration during this period will be less than its theoretical value. In short, then, it can be said with certainty that the effect of the obliquity of the rod will be to *increase* the inertia force during the upper part of the stroke, and to *diminish* it towards the lower end.

This is clearly demonstrated in fig. 2 (ii.), which is the true inertia force diagram for an engine having a connecting rod equal to four crank lengths. In this case (a), (b), (c), etc., represent the *real* positions of the pistons for the positions 1, 2, 3, etc., of the crank pin. Comparison with fig. 2 (i.) shows that the maximum upward inertia force has increased from  $aa_1$  to  $aa_{11}$ , while the maximum downward force has decreased from  $dd_1$  to  $dd_{11}$ .

### Primary and Secondary Forces.

The amount by which the true inertia force at any moment differs from the theoretical or primary force is termed the "secondary" force. That is to say, we may regard the reciprocating mass *W* as being acted upon by two forces, a "primary" force and a "secondary" force; but it should be noted that this is an arbitrary division made merely as a matter of convenience. Roughly speaking, the primary force may be said to be due solely to the motion that the reciprocating mass derives from the rotation of the

crank pin, while the secondary inertia force is attributable to the disturbing effect on the motion of the piston set up by the obliquity of the connecting rod.

### Calculation of Inertia Forces.

It is quite a simple matter to calculate the exact value in lbs. of the inertia forces. The values with which we are chiefly concerned are those at the top and bottom of the stroke. The formula for the primary force is

$$P = \frac{W \times R \times N^2}{36,000} \text{ (approximately)}$$

where *P* is the primary inertia force in lbs. at either end of the stroke, *W* is the weight in lbs. of the reciprocating parts (piston, gudgeon, top half of connecting rod, etc.), *R* is the crank radius in inches, and *N* is the speed of the engine in r.p.m. The secondary inertia force at either end of the stroke, which we will

denote by *S* lb., has the value  $P \times \frac{R}{L}$ , where *L* is the length of the connecting rod in inches. Further, if *P<sub>T</sub>* and *P<sub>B</sub>* represent the actual or net inertia forces at the top and bottom of the stroke respectively, then

$$P_T = P + S = P \times \left(1 + \frac{R}{L}\right)$$

and

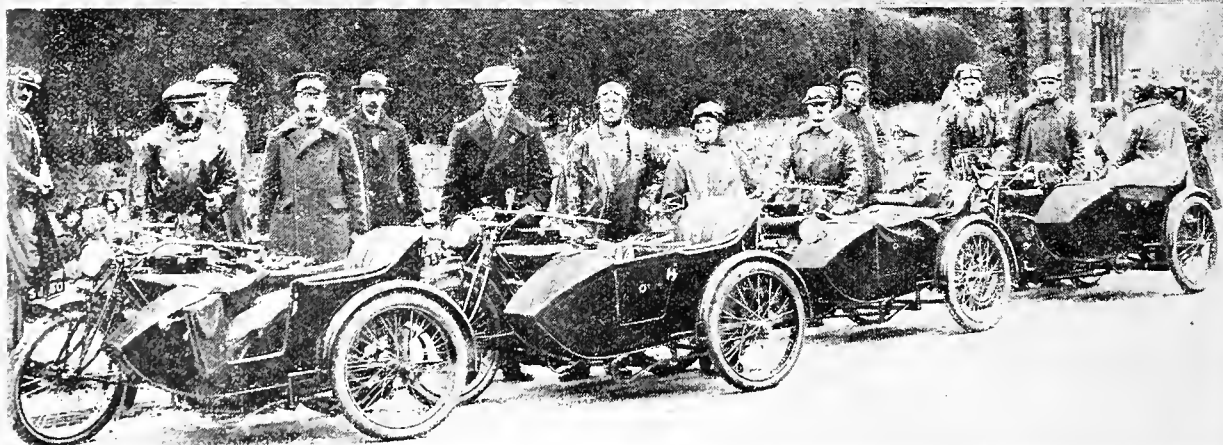
$$P_B = P - S = P \times \left(1 - \frac{R}{L}\right)$$

(see fig. 2 (ii.)).

It is clear from these formulæ that the inertia forces are increased by increasing either *W*, *R*, or *N*; this is in perfect agreement with the results of experience, for it is common knowledge that the inertia forces, as measured by the resulting vibration set up, are intensified by increasing the weight of the piston, the stroke of the engine, or the speed.

(To be continued.)

### A FINE PERFORMANCE IN THE BIRMINGHAM M.C.C. TRIAL.



As reported in our last issue, five Indians were entered in the Midland "War Workers'" Trial, and all gained gold medals. Four of these are shown above; the fifth was a solo mount.



## OVERSEAS OPINIONS.

A Further Selection of Letters from Readers scattered all over the World.

OUR April mail bag has again brought us many welcome letters from Overseas, and a number of extracts are given hereunder. The general trend of opinion expressed is on the same lines as formerly, but a new trouble has developed. Owing, probably, to the lack of tonnage, it is natural that spare parts are not over abundant in the Dominions, and we regret to learn that in one or two cases sole agents are rather inclined to take advantage of their customers in this respect. We have heard several complaints of this recently.

On the question of roads some writers, apparently ignorant of the present condition of our English roads, have compared their roads with our billiard table-like surfaces; but we think that they have no idea what an amount of damage can be done in two years of war, with roads receiving hardly any repair beyond occasional patching, and the increased heavy traffic of war lorries, etc. We rather fancy that our correspondents would be sadly disappointed were they to see many of our fine old main roads in their present condition. However, as it has often been said, "It is an ill wind," etc., for there is little doubt that this extreme roughness of road surfaces at home will do more to direct our manufacturers' attention in the direction of spring frames than any number of overseas riders' complaints. The result, of course, will be that the latter will eventually reap the benefit and get their pet British mount complete with a spring frame.

A Punjab reader, overwhelmed in enthusiasm for his sidecar, would take us to task for devoting so much attention to the baby two-stroke, to the very name of which he takes exception. He says: "Why boost noisy babies, when such magnificent machines as the 6 h.p. A.J.S. outfit and others, such as Clyno, Sunbeam, and P. and M., are on the market?" Our correspondent evidently forgets that sidecar outfits, especially those which he mentions, are not new ventures, but soundly established vehicles improved by continual trials and Piess attention in their early days—though there is still much to be done—whilst the little cheap two-stroke is quite in its infancy and requires more encouragement than an established type of machine. Incidentally, the future prospects of the two-stroke for economical motoring are undoubtedly very great.

### WHAT OUR READERS SAY.

MR. T. G. WATSON, Dudley, New South Wales: "My engine runs fairly cool as long as the temperature keeps within reasonable limits, say 75° to 85°, but a hot westerly in the bush fire season sends it up to anything from 105° to 115° in the shade. It is then that I feel the need of

something more than the usual radiating fins as designed by the makers to keep the engine below a cherry heat. On the last occasion when we had a turn of those conditions here I had a long grind uphill on a 'bush track' road! Most of it was low gear work, and I just managed to keep my poor little engine going by douching it frequently with cold tea (part of my luncheon outfit). Possibly Harcourt radiators might effect an economy of the tea—in such weather one wants the tea bottle to keep one's own works cool. A number of American firms are opening depots out here, and I know of one for a fact which is looking for premises in Newcastle. A depot in Newcastle will tap a populous wealthy, and growing district. The workers in the coalfields here earn good money, and spend freely. Motor cycling is popular amongst them, and they like the best of everything. There is already a big market, and it is going to be bigger. I predict that the Yankees are going to collar the lion's share of that market."

### Mudguard Clearance.

"P.Y.C." New South Wales: "I think mudguards could be greatly improved for machines intended for use out here. They should be flat, or, if rounded, be much larger and without side wings, on account of continually clogging up. When one rides on wet muddy roads which have not been metalled great trouble is experienced. I have frequently seen riders after riding five or six miles get off and scrape mud from between guards and wheels, and frequently having to remove the front guard to get along at all."

### British Finish v. American Cheapness.

J.L.W., Sec.-Lt., 2nd A.D.B.D., British Expeditionary Force, France: "There are some fine roads about here, better than in New South Wales, but that is about the only thing in which you beat us. Your climate, whilst being very nice for people who can go indoors to a warm room when they want to, is no good for constant outdoor tent living. We have to shiver to get warm, especially after coming from Egypt. I am an engineer, and as such appreciate the better finish and higher class work of the British article, but at the same time I would remind you that the average rider is a person to whom the above-mentioned things matter nothing, compared with ease and low price. The last mentioned, when pushed by a go-ahead people, result in the state of things existing in Australia, where the Americans are rapidly capturing the market. I cannot understand why some well-known machines still have their magnetos so close to the ground in front of the engine when there is plenty of spare room behind the cylinder. The persistency with which some firms hang on to the old system of front fork springing has been a source of wonder to me. They evidently fail to realise that our best roads are only equal to their worst."

### Insufficient Ground Clearance.

MR. P. Y. CUDBIRD, Lismore, N.S.W.: "Our roads out here are simply shocking, and the people seem to have no idea whatever of what a road should be. I only wish they would take a trip to England then they might know what a road should be like. On the last trip I made I came across four or five miles of loose metal lumps as large as one's head, and was several times nearly thrown over."

"If only manufacturers would fit spring frames to Overseas models it might make riding much more pleasurable."

### Overseas Opinions.—

Another thing that is wanted is greater clearance between the crank case and the road. A friend of mine was out recently, and when travelling at about 15 m.p.h. over a railway crossing the crank case struck the rails, which were raised about 2½ in. above the ground. It made a hole in the crank case, and he had to push the machine a distance of two miles—an unpleasant job with a temperature of 90° in the shade."

### Sole Agencies.

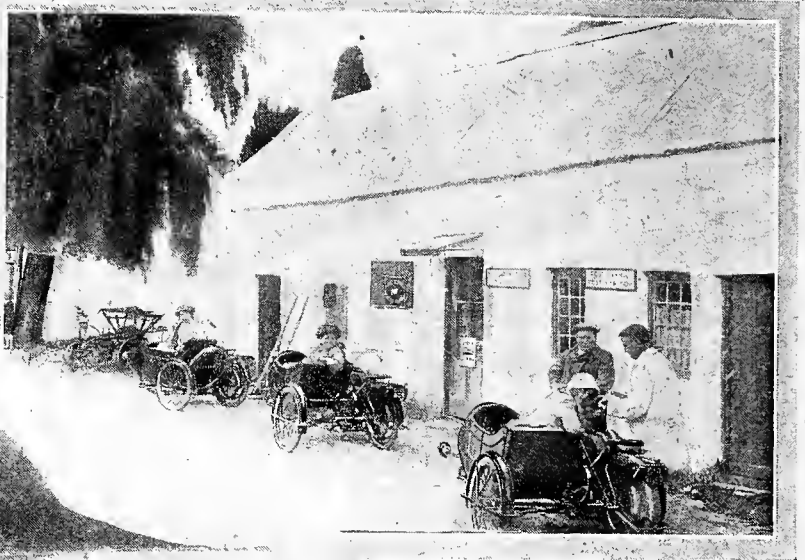
"J.H.R." Nongoma, Zululand, South Africa: "I was interested in a letter from Mr. E. Clarke, of Christchurch, N.Z., containing the following illuminating and apparently heartfelt remark: 'As far as New Zealand is concerned sole agencies are a curse to motorists.' My experience of a sole agency in this country prompts the wish that Mr. Clarke had omitted the qualification 'as far as New Zealand is concerned.' That British manufacturers should so very, very slowly adopt suggestions made for the comfort of Overseas riders raises a feeling of exasperation which is only modified by a confidence in the intrinsic soundness both of quality and design of British productions. Against this the American machines give us in design at least that for which we ask—heavy rims, spring frame, good ground clearance, 3 in. tyres, and low riding position. Over and above all this comes the matter of the sole agency, which is used by the agents, who would say, 'Deal with us or nowhere, for we control the spares.' What, then, is a patriotic motor cyclist to do?"

coming up to the starting point each time, looked like fast motor boats or destroyers at full steam. You could see just the top of the rider, and on either side was a stream of white dust about 2ft. high. Of course, there are numerous accidents."

### Difficult Travelling in Sand.

MR. J. E. ENGBLEY, Broken Hill, New South Wales: "I ride a 7 h.p. Indian two-speed, and have done several long trips inland with sidecar attached. Deep sand has been my chief trouble on these trips. I recently made a trip of 650 miles over extremely bad country. The sand was so deep at times that the footboards would be buried in it, of course bringing us to a standstill. Apart from the sand, we had no other trouble. This trip, which occupied four days, was made in the middle of summer, and the day we started the temperature was 110° in the shade."

### WITH A MOTOR CYCLE IN THE CAPE PENINSULA.



Filling up with petrol at Howe Hoek—a typical country post office. A sidecar outing by a party of Cape Town motor cyclists.

### Mudguards and Hot Engines.

MR. R. G. SULLIVAN, Inverell, N.S. Wales: "Mudguard clearance gives considerable trouble here in bad weather. If we have any rain it is almost impossible to get along on our average roads. I have often had to leave my cycle on the road and walk to my destination, being unable to get along on account of the wheels becoming jammed with mud; for this reason many riders remove their guards altogether. There is nothing on earth that sticks firmer than Australian black mud. In summer we sometimes have difficulty in keeping our engines reasonably cool. In

Warialda district the thermometer registers anything from 100° to 115° F. during summer. If the machine is stood in the sun for about half an hour it will be so hot that it is distinctly uncomfortable to place one's hand on it. There are some parts of Australia where it is even hotter than here, and you can well imagine that it is difficult to keep the engine running cool under these conditions."

### 5 to 6 in. Ground Clearance Ample in N.Z.

MR. A. W. EVERETT, Canterbury, N.Z.: "I consider five to six inches ample ground clearance, for if the weight is too high off the ground it is a little dangerous in heavy side winds. It blows very violently about the gorges out here at times."



Oude Kraal, a Cape Town motorists' paradise.

### Strenuous Races.

MR. P. GORDON CONIG, Katoomba, N.S.W.: "We are always interested in accounts of trials at home, and, although ours are on a very much smaller scale, our conditions, as far as we can make out, are even more strenuous. For instance, last year during June we had a 100 miles race, the Grand Prix. On the trip there we had to drive through snow some inches thick, and you can imagine our roads, which never have any metal on and are as slippery as glass. The Course D Circuit, held in January, was run over a three and a half miles circuit, the course being the same distance as the Grand Prix. Parts of the course were 6 in. deep in dust. This dust is just like so much flour, and underneath it are ruts of all sizes and shapes. The riders,

## A MULTUM IN PARVO EASTER TOUR.

800 MILES IN FOUR DAYS, INCLUDING  
THE BIRMINGHAM M.C.C. TRIAL.



**E**IGHT hundred miles in ninety-five hours! I can well imagine one or other London-Edinburgh competition men curling their lips disdainfully and striking a feeling of pity for one who is constrained to enthuse over such an accomplishment. But let them pause, and if they care in fancy to follow our wheel tracks over our route, they will, I am confident, admit, perhaps grudgingly, that "accomplishment" is the correct word to employ. I am a London-Edinburgh merchant myself, and can, therefore, make due comparison.

It was my brother who conceived the idea of a Welsh tour at Easter, and, acting on my advice, he obtained an itinerary from the Automobile Association upon which I think it would have been impossible to have improved. My brother's mount was a 1916 Sunbeam combination with M.A.G. engine; mine a 1914 Enfield combination with nearly 13,000 miles to its credit; and our wives were our passengers.

Our programme was rather ambitious, embracing some of the most difficult Welsh coast roads, the very severe yet extremely sporting trial course of the Birmingham Motor Cycle Club, and the return journey to London by Tuesday morning.

The weather, as all will recollect, had been atrocious for quite a considerable period before the holidays, and continued so right up to the Thursday, but Good Friday morning broke fine and sunny, much to our satisfaction and still greater to our surprise. We made our departure from Hendon at 7 a.m., bound for Aberystwyth, *via* Oxford, Worcester, Leominster, Rhayader, but unfortunately were baffled in our desire to reach Aberystwyth that night by tyre trouble with

which my brother met and by our missing the route. However, we reached Rhayader, and there put up for the night after a mileage of 210.

### The Beauty of the Devil's Bridge.

We got on the road again on Saturday morning about ten o'clock with the intention of having lunch at Aberystwyth. But again our plans were frustrated, though not this time by trouble but by pleasure. Any reader who has travelled along this road will anticipate my meaning. I refer to Devil's Bridge and all its surrounding and almost intoxicating beauties. Devil's Bridge is itself an antiquity. It consists of three bridges, not side by side or in line, but one superimposed above the other. Leaving Devil's Bridge on the way to Aberystwyth, one obtains splendid panoramas of the surrounding country, snow-capped Snowdon being plainly visible on the right at a distance, I should think, of forty or fifty miles.

Aberystwyth, where is situated the University College of Wales, a magnificent edifice, provided us with an exceedingly pleasant impression. Earlier in my remarks I mentioned our desire to reach Aberystwyth for lunch. As a matter of fact, it was nearly 4 p.m. when we arrived, having spent so much time in admiring the scenery and sights one met with after Rhayader. After tea we turned our wheels in the direction of Dolgelly *via* the roundabout coast road, with a view of staying the night. The first town we passed on the way was Machynlleth. Thence we proceeded by Aberdovey to Dolgelly, which town we consider has a right to fame by reason of its numbers of small boys and dogs, with which the place seemed to swarm.



### A Multum-in-Parvo Easter Tour.

It was our intention on the next day (Sunday) to get to Birmingham that night in time for the competition on the following morning.

#### Round the Welsh Coast.

We left Dolgelly at 6.45 a.m., reached Barmouth, which we thought an exceedingly pretty town, then proceeded through Harlech, Penrhyn, Portmadoc, and Tremadoc, passing quite close to Criccieth. After Tremadoc we drove along the Pass of Aberglaslyn, the mountain and river scenery there being magnificent. A little further we passed through Llanberis, by the foot of Snowdon, but, unfortunately, the peak was obscured by cloud. We did not, therefore, obtain anything like the magnificent view we had

of the mountain from Aberystwyth. Continuing, we reached Carnarvon early. Thence we passed on by the Menai Bridge to Bangor. The Anglesey country appeared very fine from the extensive view we had of it from the Welsh coast road. From Bangor we turned south, bound for Birmingham, via Bettws-y-Coed, Llangollen, etc. Unfortunately, time did not permit of any leisure in viewing the sights of the two towns last mentioned, but the country in the vicinity was suggestive of many hidden beauties.

#### A Notorious Piece of Road.

Near Corwen we unfortunately struck a piece of road about ten miles in length the surface of which baffles description. I trust that by the next time I may be in that district and likely to employ the same road the local surveyor will have had occasion to travel over it at speed on a solid tyre push cycle propelled by an Auto-wheel. I think that things round there would then "move some." After Llangollen the road surface improved until it became of a billiard-table-like character, and for mile after mile we were able to enjoy the pleasure of averaging 30 m.p.h. This joy, however, was somewhat adulterated by the nightmare of a ride we had in the dark between Wolverhampton and Birmingham with regulation discs in our lamps.

### Impressions of the Birmingham Trial.

The following morning we were up betimes making several precautionary adjustments to our mounts preparatory to the start of the Birmingham Trial at nine o'clock, as although we had been fortunate in experiencing an almost trouble-free journey right through to Birmingham, we anticipated a stiff course, and did not wish to leave anything to chance. However, "Man proposes —," as, although I made a clean sheet during the morning part of the trial, I unfortunately petered out on Sudeley Hill when going well at 20 m.p.h., due to my carburetter entirely drying up. It speaks well for my machine when I say that on all the single-figure observed gradients my speed never dropped below 20 m.p.h., more especially when one considers the mileage previously covered. A

most curious coincidence was provided by the behaviour of my brother's machine on Sudeley Hill, which suffered from exactly the same trouble as mine, but my brother cleverly saved the situation by bending down and flooding his carburetter, thus enabling the machine to get going again before actually stopping.

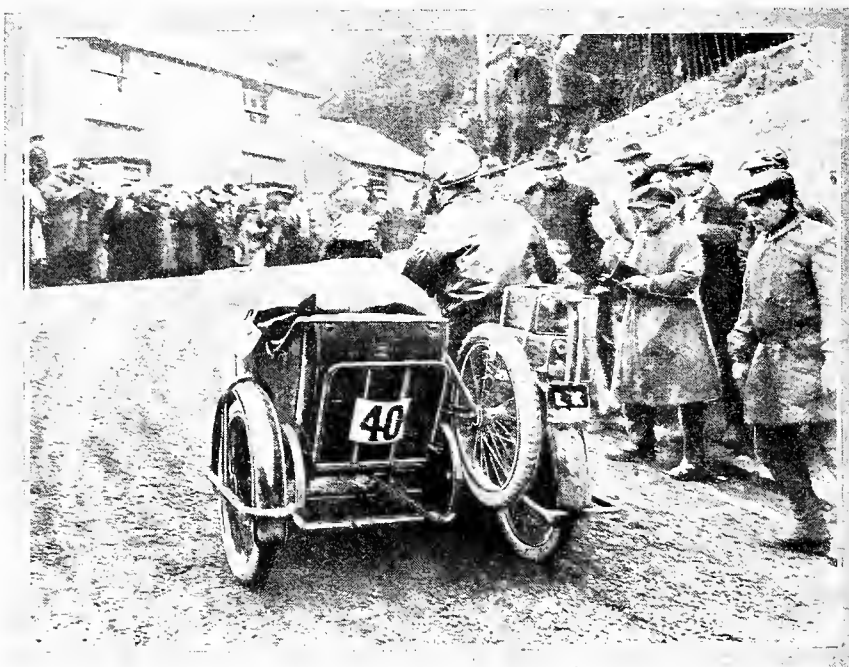
The trial was run over an extremely sporting course, and, although feeling very tired, we enjoyed it thoroughly; in fact, more than

any competition in which we had previously taken part. We arrived back at Birmingham itself about eight o'clock, had some tea and a rest, and left at about 11 p.m. to travel home overnight, as my brother had to be back in town on the Tuesday morning.

Eight miles before reaching Blechley we picked up a soldier tramping to that station on his way back to the Front on the following Wednesday. We apologised to him for his rough seat on the back, but he said that it was an armchair compared to some of the seats he had experienced during his twelve months in France. Thereafter our journey proved uneventful, and we arrived back at Hendon about 6 a.m., after an almost continuous mileage of 280.

I will conclude the remarks by adding we had breakfast and a bath, went to bed about 10 a.m., had some lunch at midday, and went to sleep again and did not awake until five o'clock on Wednesday morning, making total of eighteen hours' sleep.

TOM COATES.



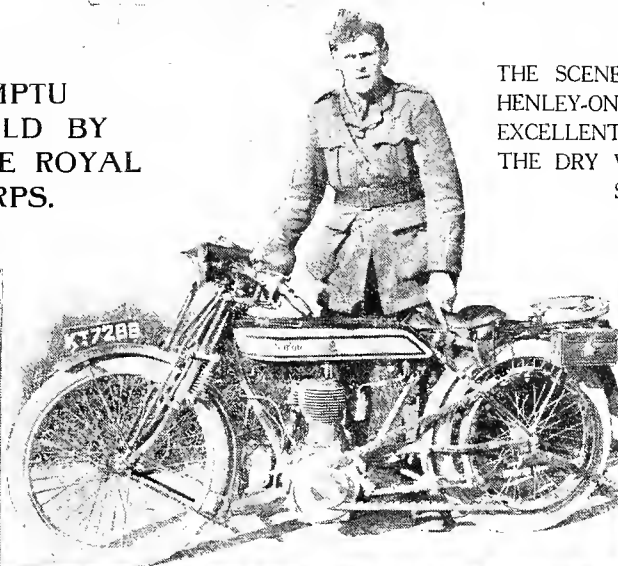
R. S. Coates (8 h.p. Sunbeam sidecar) climbing the Old Wyche in the Birmingham M.C.C. trial. Mr. Coates is the brother of the writer of the accompanying article. Both included the trial in the itinerary of a holiday tour. Note touring equipment and two spare tins of petrol on carrier.



**AN IMPROMPTU  
HILL-CLIMB HELD BY  
OFFICERS OF THE ROYAL  
FLYING CORPS.**

(Above) A driver of a Triumph sc., who made a good ascent.

(Below) To get down the hill is sometimes more difficult than getting up. Several human brakes were required in this instance.

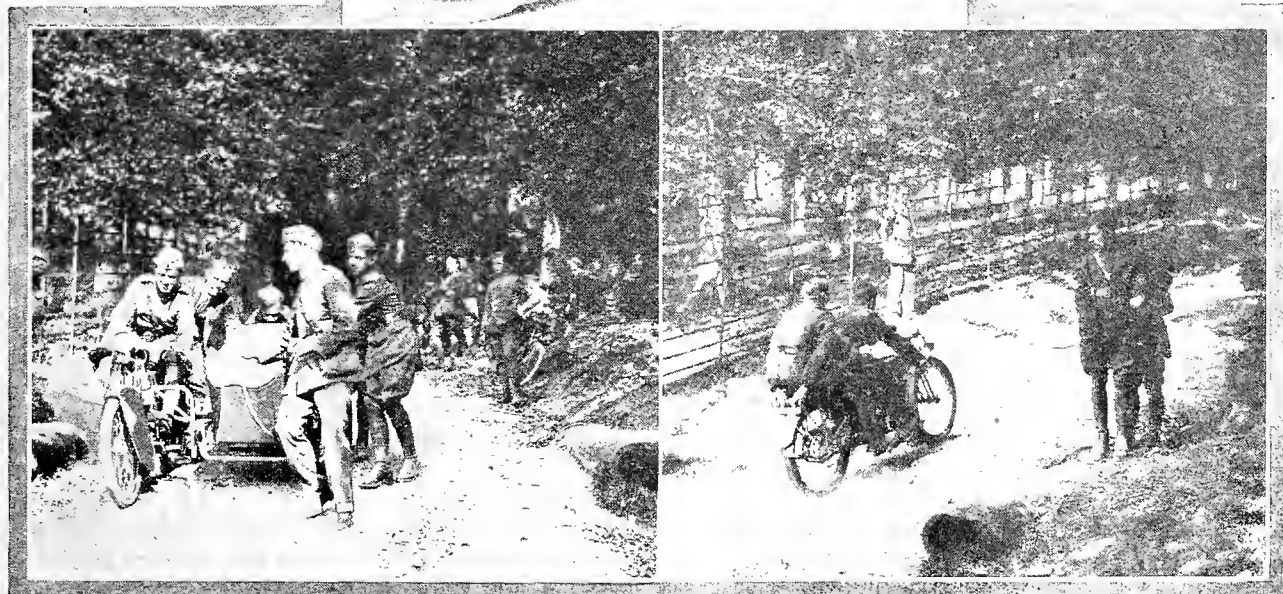


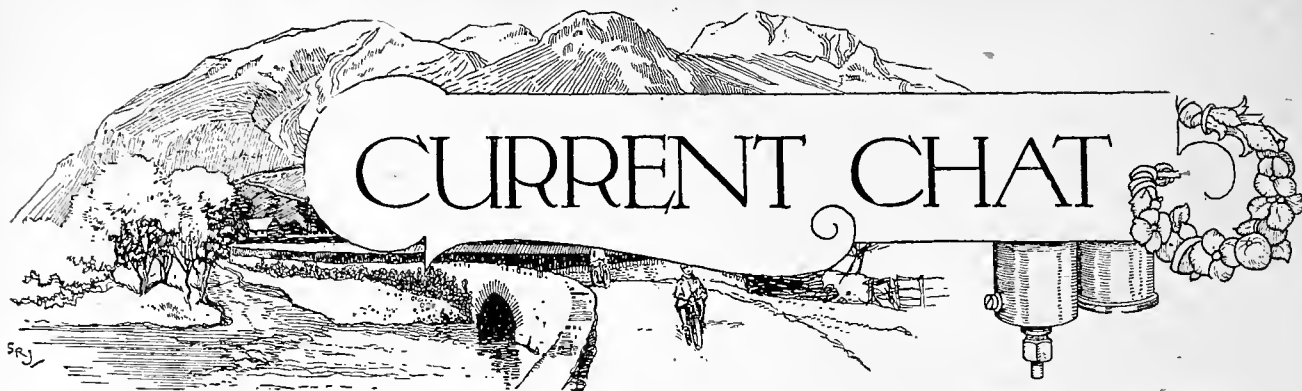
THE SCENE WAS ALMS HILL, NEAR HENLEY-ON-THAMES, WHICH WAS IN EXCELLENT CONDITION, THANKS TO THE DRY WEATHER, AND THE DATE, SATURDAY LAST.

(Above) Sec.-Lt. Milne (5 h.p. Indian) nearing the top. His time was 54½s., third fastest.

(Centre) Capt. Scott, who made fastest time—50½s.—on his Norton.

(Below) With a passenger on the carrier. The machine is a Harley-Davidson, and the rider Lt. de Courcy.



**TIME TO LIGHT LAMPS.**

GREENWICH TIME.

May	4th	...	...	7.55 p.m.
"	6th	...	...	7.58 "
"	8th	...	...	8.0 "
"	10th	...	...	8.3 "

**Recognition for Volunteers.**

Volunteers have recently been given military status by the War Office, and it is now unnecessary to wear the red "G.R." armlet on their green-grey uniform. The officers are, it is stated, to have commissions.

**Control of Petrol.**

The committee appointed by the Board of Trade to control the supply and distribution of petrol—the formation of which was announced in the daily press a few days ago—has issued an appeal to all users to restrict consumption as far as possible.

The members of the committee are Mr. Oliver Bury (chairman), Mr. A. E. Bowen, Sir John Hewett, Mr. Philip G. L. Webb, and Mr. H. W. Cole of the Board of Trade (secretary). The offices of the committee are at 29, Abingdon Street, Westminster, S.W.



A J Dowler ( $3\frac{1}{2}$  h.p. Sunbeam), a gold medal winner in the Birmingham M.C.C. trial reported in our last issue.

**The Institution of Automobile Engineers.**

The next meeting of the Institution of Automobile Engineers will be held in the Hall of the Royal Society of Arts, John Street, Adelphi, W.C., on May 10th, at 8 p.m., when Mr. L. H. Pomeroy, Wh.Ex., will read a paper entitled "The E.S.C. Standard Steel Specifications."

**Plain Bearings for Steering Heads.**

A. B. Wade, in writing from France, where he is serving with the M.M.G.S., refers to the subject of stands for sidecar outfits, which we discussed some little time ago. He tells us that the fact of a heavy outfit being jacked on to a stand, which, owing to its construction, can only stand on one leg, is the cause of a large portion of the repairs. Another point he brings up is the fact that ball bearings in the steering head give a very great deal of trouble, and he is of opinion that a well-made plain bearing would overcome the difficulty. We are personally inclined to think the plain bearings would give considerably more trouble than the ball bearing type. Other opinions on this subject would be interesting.

**Trials Wanted.**

When things are normal again, and trials "to improve the breed" are run once more, there are two points in the modern machine which require to be developed. One of these is cleanliness—that is, cleanliness of a nature which this war is not tending to bring about. Note this suggestion, ye trials organisers! Start your competitors on new motor bicycles, and clothed in new and spotless overalls, on a hundred miles run over any sort of roads, and then dock them a mark for every spot or part of a spot to be found on these once unsullied garments. Mud spots to be ignored, oil spots to count.

**Flexibility.**

Here is another idea. Start the competitors on track or road—it does not matter which—and make them run as slowly as possible upon top gear. Then take off marks from every machine which misses fire. Next take the motor cycles which have passed this test, make them go through it again, and then at a certain spot where there are observers make the drivers suddenly accelerate. We wonder how many motor cycle engines, four-stroke or two-stroke, would go through this ordeal without losing marks for misfiring.

**SPECIAL FEATURES.**

A NOVEL ENGINE (illustrated).  
A MULTUM-IN-PARVO TOUR.  
IMPROMPTU HILL-CLIMB BY  
R.F.C. OFFICERS.

**Canadian Military Relay Run.**

The Canada Motor Cyclists' Association are organising a relay run of 300 miles from Ottawa, the home of the Canadian army headquarters, to Niagara-on-the-Lake, where there is a big camp. The run will take place in June, and it is expected that about forty riders will be required.

**Mudguarding.**

There is one thing that the great trial now going on "over there" is developing, and that is protection against mud. Let those makers who are not among the chosen few note the developments in this direction, and also the improvements in frames and spring forks. What we want is an unbiased report for the benefit of the trade in general, and not the accumulation of data for the benefit of only two or three makers.



HOLDERS OF THE WATCH.  
Messrs. Alec Ross and Olai, starters in last week's Birmingham M.C.C. trial

**Have you seen him?**

An advertisement in the daily papers offers £20 reward for identification and detention of a soldier, age nineteen, looks older, 5ft. 9½in., 41in. chest, blue eyes, strongly built, who may probably enlist for immediate service abroad, "preferably Motor Machine Gun Section."

**Police Traps.**

The Metropolitan police are, as usual, very active. There are two traps on the main London-Staines-Exeter road, one from Youngs Corner and the other from Gunnersbury Station to Gunnersbury Lane. We are informed that the policemen boast of the number of convictions they make. The police traps certainly did not prevent a nasty accident last Sunday morning, when a man was run over by a steam lorry.

**Hill-climbing in South Australia.**

The South Australia (Adelaide) M.C.C. held a hill-climb at Sellicks Hill some time ago, though results have only just reached this country. Timing was over a distance of 3½ miles, and formula results were as follow:

UP TO 300 c.c.

1. J. R. Koch (2¼ Lewis)
  2. E. E. Warren (2¼ Elliott-Villiers)
- Fastest time, Koch, 7m. 20 4-5s.

300 TO 350 c.c.

1. H. J. Gard (2¼ Douglas)
  2. J. L. Koch (2¼ Lewis)
  3. E. E. Koster (2¼ N.S.U.-Kent)
- Fastest time, Gard, 6m. 45 1-5s.

PRIVATE OWNERS, UP TO 600 c.c.

1. F. R. Limb (¾ Norton)
  2. E. E. Koster (¾ Kent)
  3. W. Driver (¾ Norton)
- Fastest time, Limb, 5m. 47s.

TRADE RIDERS, UP TO 600 c.c.

1. A. B. Carnell (¾ Lewis)
  2. R. H. Abbott (¾ Kent-Jap)
  3. W. Driver (¾ Norton)
- Fastest time, W. Driver, 6m. 3 1-5s.

OVER 600 c.c.

1. N. K. Torode (7 Indian)
  2. O. E. Nalty (7 Indian)
  3. E. O. Wagener (8 Blue Spec-Jap)
- Fastest time, Torode, 5m. 41 1-5s.

SIDECARS UP TO 600 c.c.

1. W. Courtney (¾ Lewis sc.)
  2. L. S. Eglington (¾ Kent sc.)
  3. E. Warren (4 Elliott sc.)
- Fastest time, Courtney, 8m. 5 4-5s.

SIDECARS OVER 600 c.c.

1. E. Whitten (7 Excelsior sc.)
  2. E. Ferguson (7 Indian sc.)
- Fastest time, Warren, 7m. 14 2-5s.

**First News and "The Motor Cycle."**

Following upon our first exclusive descriptions with illustrations of the Birmingham and Sheffield Easter Trials (a week in advance of other journals), we give in this issue the first illustrated account of an impromptu hill-climb at Alms Hill, organised by officers of the R.F.C. stationed in the South Midlands. Among the other features of this issue is a description with drawings and photographs of an engine of strikingly novel design, whilst Overseas motor cyclists will find much to interest them.

**Taxation and Economy.**

A reader informs us that in consequence of the large increase in motor cycle taxation he has decided to resign his membership of the Automobile Association and Motor Union.

**The National War Funds.**

At the week-end the principal relief funds stood as follow:

The Prince of Wales's National Relief Fund (£5,153,000 distributed)	£5,885,817	0	0
The Queen's Work for Women Fund	169,324	8	10
Fund for the Sick and Wounded	3,687,289	0	0
Tobacco Fund	105,335	0	0
Polish Victims' Relief Fund	125,323	12	10

**Birmingham Trial Results.**

The illustrated report of the Birmingham M.C.C. Easter Monday trial published in our last issue concluded with the provisional results. The committee has since made one or two amendments as follow:

J. E. Greenwood (4 Sunbeam) awarded gold medal.

A. Birch (2¾ Douglas) awarded first-class certificate.

Staff Sgt. C. B. Thomson (4 Douglas sc.) awarded first-class certificate.

T. Sinister (4 B.S.A. sc.) awarded first-class certificate.

B. W. Harcourt (8 Rex-Jap) awarded second-class certificate.

Miss Hough (8 Morgan) awarded second-class certificate.

P. G. Tomkins (2¾ Douglas) awarded second-class certificate.

A. E. Kibble (4 Triumph) disqualified for leaving course.

**Present and Future Condition of our Roads.**

Colonel R. E. Crompton at the meeting of the Roads Improvement Association last week said the roads throughout the country had deteriorated to a serious extent, and no extensive improvement could be expected at present.

It was unfortunate that the Government found it necessary to appropriate the Road Board's income for war purposes, and it must have the effect of adding to the work to be done by the association hereafter. The Roads Improvement Association had urged that the fullest advantage should be taken of the existing funds to keep the roads in as good a state as possible.

**The Clearing House.**

There are still six members who have not received parcels resulting from the Birmingham district motor cyclists' patriotic concert. The names are:

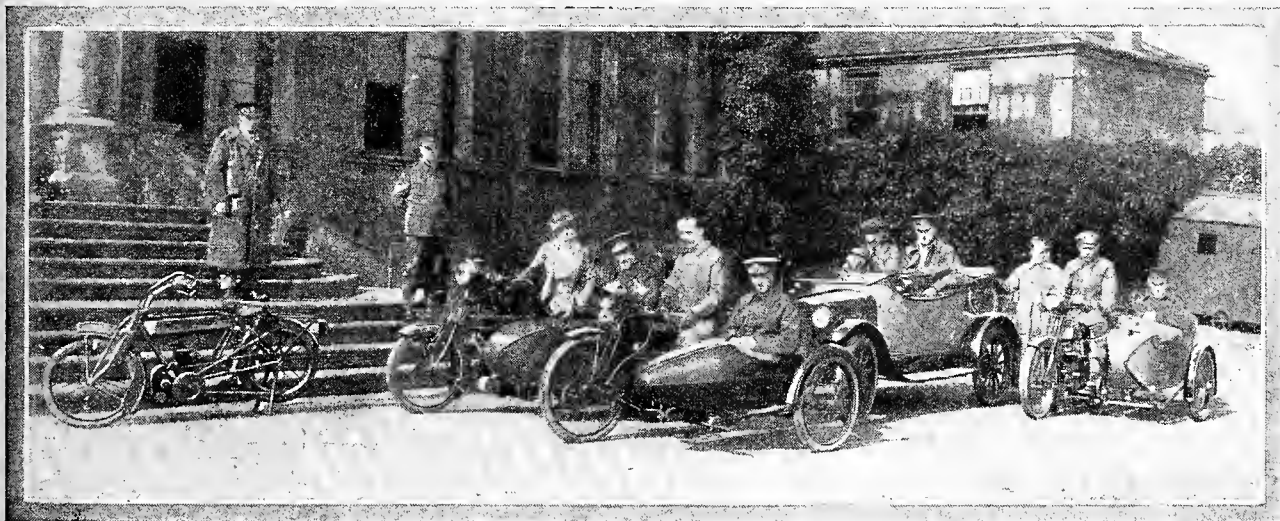
- T. W. Bladder, joined 10th Warwicks.  
R. B. Ewens.  
E. A. Eastwood, of Derby.  
B. L. Patterson-Tylden, of Derby.  
H. A. Pattman, Lt., Birmingham Battalion of Warwicks.

G. H. Stocking, joined A.S.C., M.T.

Should this paragraph meet the eye of any of these, they should write to Mr. S. Kempson Jones, 93, John Bright Street, Birmingham. Information is also desired concerning whereabouts of relatives of Sgt. T. Hubbard, a member of the North Birmingham Club, who joined the R.E., and was subsequently killed in France.

**A Curious Accident.**

An accident occurred during holiday week near London, due to a party of beanfeasters on a waggon being pulled up in the centre of the road by the police for driving without lights. Almost immediately after, a motor cyclist proceeding with the usual greatly reduced lights collided with the back of the waggon, causing serious damage to both himself and his machine.



**A SIDECAR OUTING FOR WOUNDED SOLDIERS.**

Taking advantage of the summer-like weather, some members of the Doncaster M.C.C. take a few convalescent soldiers for a sidecar outing. Two of the drivers, it will be noted, are ladies.



# "THE MOTOR CYCLE" RECRUITING SECTION.

## RECRUITS WANTED FOR IMMEDIATE SERVICE ONLY.

### Central Office for Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

### Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

**A**S was anticipated, the calling up of the married groups between 33 to 41 (ages 27 to 35) has caused a great increase in the number of applications to join the M.M.G.S., though there never was any dearth of candidates for this section. A delay of a day or two is inevitable in dealing with the mass of correspondence, and it would relieve the pressure if motor cyclists and car drivers will note the particulars on this page, and attend one of the inspections arranged. There is no need to write at all, except in the case of men situated a long distance away. Such men who desire to join the M.M.G.S. should fill in the form provided (see page 402 of the last issue of this journal), and attach two references as to experience and ability, when, if satisfactory, a free railway warrant will be forwarded.

Only applications from men ready for immediate service can now be dealt with.

Last week in Manchester over fifty candidates presented themselves for test, and forty-seven were duly accepted. A good proportion were young men, hitherto employed in reserved occupations, and now released for service.

On Saturday last Mr. Geoffrey Smith, the editor of *The Motor Cycle*, attended at 20, Tudor Street, London, E.C., to interview applicants from London and the South, and many of these men are now in khaki at the training centre.

For the information of prospective recruits, the conditions of enlistment in the M.M.G.S. are appended.

Applicants must be experienced car drivers or motor cyclists, able to execute ordinary running repairs.

Pay, 1s. 2½d. per day, all found.

Enlistment for duration of war.

Usual separation or dependants' allowance.

Age limits, 19 to 40.

Applicants must be medically fit for General Service abroad or for Garrison Service abroad.

8,988 is the total number of applications from motor cyclist and car driver recruits personally dealt with by the editor of this journal since the outbreak of war.

### Next Week's Inspections.

This week's inspections were at Coventry on Tuesday and Nottingham yesterday (Wednesday).

During next week Mr. Geoffrey Smith will attend at

COVENTRY.—Recruiting Office, Masonic Buildings, 11 a.m. to 4.30 p.m., Tuesday, May 9th.

LONDON.—*The Motor Cycle* Offices, 20, Tudor Street, E.C., 1.30 p.m. to 4.30 p.m., Saturday, May 13th.

Motor cyclists and car drivers ready for immediate service can be tested at the above times and places.

Two motor cyclists from the Isle of Wight, who were due to attend an inspection of recruits in London on Saturday last, became acquainted with each other by the fact that one was reading *The Motor Cycle* whilst crossing the ferry from Cowes to Southampton. On the reader being approached, both were agreeably surprised to find that they were bound for the same destination.

### Last Week's Recruits.

A list of over a hundred recruits accepted last week is appended:

Adler, P. B., Hove.  
Ainley, O., Rotherham  
Allen, A., Gresswell.  
Allnatt, J. O., Wokingham.  
Atkin, H., Grimsby.



A GOOD LOAD FOR THE 6 h.p. SUNBEAM SIDECAR.  
Seven men of the Motor Machine Gun Section returning to camp from trench practice.

Baines, J. H., Wing.  
Barton, L., Manchester.  
Baxendale, O. O. B., Sabden.  
Bell, C., Wigan.  
Blankens, E. J., London.  
Boswell, G. O., Rolleston.  
Bothway, R. E., Norwich.  
Boutel, M., Bushey.  
Bowker, J. J., Tattenhall.  
Braid, A., Abergelle.  
Bramble, R. J., Winchester.  
Briggs, N., Bradford.  
Brooks, W., Sale.  
Bullock, H., Eastleigh.  
Bye, F., Winchester.  
Carruthers, R. G., Edinburgh.  
Chandler, W. P., Brixton.  
Chapman, H., Lincoln.  
Clement, O. H., Bognor.  
Cockton, J. B., Cockermouth.  
Dark, E., Preston.  
Davidson, A., Glasgow.  
Dimond, W. A., Didsbury.  
East, M., Coraard.  
Flint, P. A., Eastbourne.  
Giddins, W. V., Crowland.  
Goldie-Taubman, P., Brighton.  
Gooch, L. J., Brondesbury.  
Groves, H. G., Witney.  
Gwyther, R. P., Herne Bay.  
Haggerth, L., Colne.  
Halford, F., Idle.  
Harmer, C. W., Ticehurst.  
Hedges, A. J., Weymouth.  
Hix, J. G., Holbeach.  
Hobbs, H. J., Earl's Court.  
Hodgson, W. J., Westcliff-on-Sea.  
Holden, J. W., Cobham.  
Howard, G., Clitheroe.  
Jacques, W., Cirencester.  
James, F. C., Northampton.  
Jennings, G., Shipley.  
Jones, G. P., Lertonstone.  
Kilminster, W., Walthamstow.  
Knight, C. R., Wembley.  
Lawrence, C., Cowes, I.O.W.  
Lee, J., Nelson.  
Leone, W. C., Brixton.  
Loch, W. H., Dawlish.  
Long, E., Grange-over-Sands.  
Lori, R., Colne.  
Mackenzie, J., Liverpool.  
Mann, G., Avoch, N.B.  
Mansfield, H. J., Upper Clapton.  
Marshall, A. C., Epsom.  
Merry, F., Bolton.  
Morgan, E., Norwich.  
Nadin, J., Nelson.  
Needham, G., Holbeach.  
Newell, J. H., Bradford.  
Nicholls, J., Nantwich.  
Norris, G. A., Muswell Hill.  
Norfold, W., Brighton.  
Petrie, J., Kirkcaldy.  
Pier, A. G., Bexton.  
Pinnock, R. E., Hammersmith.  
Priscott, R. H., Hurstpierpoint.  
Pryce, H. C., King's Langley.  
Pugh, W. D., Ealing.  
Purkis, G. A., Newport, I.O.W.  
Reeks, S. T. O., Bournemouth.  
Richmond, H., Manchester.  
Ritchie, A., Norland.  
Rivers, F. G., South Farnborough.  
Robinson, A. E., Gainsborough.  
Roney, J. B., Barrow-in-Furness.  
Rosenberg, D., Stepney.  
Routledge, H., Carlisle.  
Rovston, E. R., Little Evesden.  
Scott, W., Horsham.  
Selfe, R. W. C., Stratham.  
Sherwood, H., Winchester.  
Shuttleworth, W., Chorlton-cum-Hardy.  
Sladden, F. M., Brighouse.  
Springham, P., Lindfield.  
Stinnett, G. H., Spalding.  
Strauss, S. G., Salford.  
Sugden, L., Wokingham.  
Sutherland, J. W., Wealdstone.  
Swales, J., Market Weighton.  
Thornton, J., Preston (Hull).  
Thornycroft, E. F., Nantwich.  
Toombs, V., Mildenhall.  
Trought, H., Grimsby.  
Unsworth, G. G., Altrincham.  
Wadsworth, C., Sowerby Bridge.  
Walmsley, J., Darwen.  
Walton, E., Southport.  
Westmacott, J., Dorchester.  
Whalley, R., Walkden.  
White, L. R., Folkestone.  
Williams, F. C., Alton.  
Wright, E. G., Paddington.

## Overseas Notes and News.

### ACTIVITY OF THE CANADA M.C. ASSOCIATION.

AT present nobody under the age of eighteen may ride a motor cycle in Canada. The Canada Motor Cyclists' Association has appealed to the Ontario Government for the reduction of the age limit from eighteen to sixteen years for riders of lightweights and bicycles with motor attachments. The result of this appeal will be looked forward to with interest, especially the definition of a lightweight, if the suggestion is adopted.

With a view to encouraging American motor cyclists touring in Canada, the C.M.A. expects to secure a concession from the Federal authorities in the way of a ten days' free privilege for motor cyclist tourists entering the country. This concession will enable American riders to tour in the Dominion for ten days without the necessity of paying a deposit or making a bond to cover duty charges at time of entry.

### RACING ON LAKE PERKOLILLI.

A RACE meeting of the Goldfields (Western Australia) Motor Club on March 19th was spoiled by a heavy downpour of rain. The scene of the racing was the bed of Lake Perkollili, and the heavy downpour only permitted of part of the programme being run. Results of those events which were run are:

#### 4 MILES OPEN HANDICAP.

1. J. Elsbury (Sunbeam).
2. Len Hope (Sunbeam).
3. A. E. Pike (Triumph).

Winner's time, 4m. 30½s.

#### 6 MILES GOLDFIELDS CHAMPIONSHIP.

1. J. Elsbury (Triumph).
2. Len Hope (Sunbeam).
3. Roy Wigmore (Triumph).

Winner's time, 6m. 45s.

#### 4 MILES CLASSICO.

1. Len Hope (Sunbeam).
2. A. McDonald (B.S.A.).
3. Roy Wigmore (Triumph).

Winner's time, 4m. 43½s.

### U.S.A. MILITARY AUTHORITIES AND THE MOTOR CYCLE.

OUR American contemporaries are evincing great interest in the part that motor cycles are playing in the punitive expedition against the Mexican, Villa. It is considered that the Mexican scrap is a test for the military motor cycle—though one would have thought that the latter has been proved in the great war—and upon its success or otherwise depends its adoption in numbers by the whole army of the United States.

At present there appear to be between 90 and 120 machines in use, and, according to *Motor Cycling and Bicycling*, they are numerous in proportion to the size of the army on Villa's trail. According to the same paper Brig.-Gen. Bell has made certain recommendations regarding the use of motor cycles to the U.S. War Department, based upon his observations of the machines at present in use. These recommendations are that every infantry regiment should be equipped with four motor cyclists, and every cavalry regiment with at least six motor cyclists.

There are at present thirty infantry regiments, whose equipment would require 120, and fifteen cavalry regiments which would require 90 machines. "The grand total," as our Chicago contemporary puts it, of 210 does not sound very impressive, judging by British numbers, but, of course, with an increase of the U.S.A. army—which may be expected at any moment—the number of motor cycles would be correspondingly increased.

It is stated that among the fleet at present in use in Mexico are five Cygnet rear cars. These are trailers which can be adapted to fit any motor bicycle.

### TRACK RACING IN ITALY.

THE name of Miro Maffei is becoming familiar to British motor cyclists as that of a particularly fine Italian rider. The name generally appears in the honours list of any race meeting held in Italy. Miro Maffei's latest achievement was at the Milan track, on Sun-



Miro Maffei (Stucchi-Precision), a well-known Italian racing motor cyclist.

day, 16th ult., when he won a match against Merlo, whose mount was a Frera machine with S.I.A.M.T. engine. Great interest was added to the event by reason of the fact that, a week before, the same riders raced and the positions were reversed. Maffei rode a Precision-engined Stucchi.

### THE LAUNCESTON-HOBART RECORD.

THE 122 miles separating the two chief towns of Tasmania have during the past few months held a peculiar fascination for record-breaking motor cyclists. On page 403 of our last issue we referred to the time of 2h. 34m. 50s. made by E. Bayles, but, according to the March number of *Melbourne Motor Cycling*, this has been lowered to 2h. 33m. 0½s. by W. H. King, who rode an Indian.

### Average Prices

OF

### Second-hand Machines.

From "The Motor Cycle" of April 27th.

Make.	Year.	H.P.	Average for last week.	Latest weekly average obtainable
A.B.C.	1915	3½	4-speed	£93
A.J.S.	1915	6	3-sp. sidecar	£92
"	1914	6	3-sp. sidecar	£56
"	1915	2½	3-speed	£47
"	1915	2½	3-sp. T.T.	£50
"	1914	2½	2-speed	£39
Allon	1916	2½	2-stroke	£36
"	1915	2½	2-stroke	£34
Bat	1914	5	3-sp. sidecar	£53
"	1913	6	2-sp. sidecar	£32
Blackburne	1915	3½	3-speed	£53
Bradbury	1914	6	3-sp. sidecar	£59
"	1913	4	sidecar	£32
B.S.A.	1915	4½	3-sp. sidecar	£61
"	1914	4½	3-sp. sidecar	£51
"	1915	4½	3-speed	£47
Calthorpe	1915	2½	2-speed	£27
"	1914	2½	2-speed	£16
Campion	1914	6	sidecar	£51
Clyno	1914	6	3-sp. sidecar	£56
"	1913	6	3-sp. sidecar	£53
Cov. Eagle	1915	2½	2-stroke	£25
Douglas	1915	2½	3-speed	£45
"	1915	2½	2-speed	£43
"	1915	2½	T.T.	£48
"	1915	4	3-sp. sidecar	£57
"	1914	2½	2-speed	£37
"	1914	2½	2-sp. T.T.	£34
Enfield	1916	6	2-sp. sidecar	£87
"	1915	8	2-sp. sidecar	£74
"	1915	6	2-sp. sidecar	£74
"	1914	6	2-sp. sidecar	£66
"	1913	6	2-sp. sidecar	£47
"	1915	3	2-speed	£40
"	1914	3	2-speed	£35
Excelsior (A)	1915	7	3-speed	£50
H.-Davidson	1915	8	3-sp. sidecar	£76
Henderson	1913	4	cylinder	£29
Hobart	1915	2½	2-stroke	£30
Humber	1914	2½	3-speed	£26
"	1913	3½	2-sp. sidecar	£33
Indian	1915	7	3-sp. sidecar	£28
"	1915	7	T.T.	£48
"	1915	5	3-speed	£55
"	1915	5	3-sp. sidecar	£62
"	1915	3½	3-speed	£48
"	1914	7	2-sp. sidecar	£52
"	1914	7	2-speed	£45
James	1915	3½	3-speed	£48
"	1915	4½	3-sp. sidecar	£61
"	1914	4½	3-sp. sidecar	£47
Lea-Francis	1914	3½	2-speed	£48
Levis	1915	Popular		£24
Matchless	1914	8	3-sp. sidecar	£71
"	1913	8	2-sp. sidecar	£50
"	1915	8	3-sp. sidecar	£88
"	1913	6	2-sp. sidecar	£43
Motocacoe	1913	2½	multi gear	£14
New Hudson	1915	2½	2-speed	£28
New Imperial	1915	2½	2-speed	£26
Norton	1915	3½	T.T.	£46
New Ryder	1915	2½	2-speed	£27
P. & M.	1915	3½	W.O.	£59
"	1914	3½	2-sp. sidecar	£50
"	1913	3½	2-sp. sidecar	£38
Premier	1915	3½	3-speed	£44
"	1914	2½	3-speed	£20
"	1914	3½	3-sp. sidecar	£48
Rex	1913	6	2-sp. sidecar	£34
"	1914	6	2-sp. sidecar	£40
Rover	1914	3½	3-sp. sidecar	£42
"	1914	3½	3-speed	£38
"	1913	3½	3-sp. sidecar	£34
"	1912	3½		£24
Royal Ruby	1915	2½	2-stroke	£24
Rudge	1915	3½	multi T.T.	£52
"	1914	3½	multi sidecar	£44
"	1914	3½	multi	£36
Scott	1914	3½	2-sp. sidecar	£52
"	1913	3½	2-sp. sidecar	£38
Sunbeam	1915	3½	3-speed	£60
Triumph	1915	2½	2-stroke	£32
"	1915	4	3-speed	£41
"	1914	4	3-speed	£40
"	1914	4	3-sp. sidecar	£53
"	1913	3½	3-speed	£31
"	1913	3½	3-sp. sidecar	£49
Tyler	1915	2½	2-sp. 2-stroke	£26
Williamson	1914	8	2-sp. sidecar	£70
Wolf	1914	2½		£18
Zenith	1913	8	Gradna sidecar	£52
"	1914	6	Gradna sidecar	£48

# MOTOR CYCLE TAXATION.

A commendably clear Statement submitted to the Treasury by the A.C.U.

**W**E must congratulate Mr. T. W. Loughborough, the secretary of the A.C.U., on the well-reasoned and complete statement which that body has laid before the Treasury, and a copy of which is in our possession.

It is assumed by the A.C.U. that the main object of gradation is increase of revenue. Any method adopted should, therefore, be based on:

The ability to pay on the part of the owners of motor cycles.

It is understood that there are three other main considerations:

1. The restriction of motoring for pleasure.
2. Correlation with the taxes imposed on motor cars.
3. The amount of damage caused to road surfaces.

Further, that any method adopted should be simple to understand, thus resulting in ease of collection, whilst the importance of not handicapping the industry should not be overlooked.

It is contended that the use of the Treasury Rating fails to attain any of these objects but the restriction of motoring for pleasure, and the A.C.U. is prepared to produce evidence that this hardly exists at the present time. On the other points the Treasury Rating is found wanting because it is not a true measure of horse-power; it has no relation to the purchase price of either new or second-hand machines; it is inapplicable for technical reasons, and gives a very unfair comparison of horse-power between cars and motor cycles; it would force manufacturers to adopt one type of engine, the long stroke single-cylinder (and although this type is excellent it is not desirable that it should be developed to the exclusion of other

equally meritorious designs); and lastly it would make collection difficult, as motor cyclists do not understand the rating. In the Government proposals the classes are too few, and consequently the steps are too steep, e.g., a twin-cylinder of 72 mm. bore would be taxed at £3 3s., while an extra millimetre on the bore (although the stroke may be shorter and the real horse-power less) raises the tax to £4 14s. 6d.

It is, therefore, proposed that the tax shall be graduated on the cubic capacity (or, more correctly, the volume swept out by the piston) at the rate of 10s. 6d. per 125 c.c., the lowest tax being £1 1s. for 250 c.c. and under. This is substantially the same as the suggestion already put forward in *The Motor Cycle*.

## The A.C.U. Scheme in a Nutshell.

### EXAMPLES OF WELL-KNOWN MAKES.

Cubical Capacity.	Name.	Average Price.	Max. H.P. at 14.5 p.m. per 125 c.c.	Tax.
Not exceeding 250 c.c.	O.K. Junior, Auto-wheel, Calthorpe, Dayton, Levis	£25	2	£1 1 0
Exceeding 250 c.c., not exceeding 375 c.c.	Clyno, Levis, Royal Ruby, Douglas	£39	3	£1 11 6
Exceeding 375 c.c., not exceeding 500 c.c.	B.S.A., Humber, Norton, P. & M., Singer, Enfield	£57	4	£2 2 0
Exceeding 500 c.c., not exceeding 625 c.c.	Scott, Bradbury sc., B.S.A., James, Triumph, A.J.S.	£64	5	£2 12 6
Exceeding 625 c.c., not exceeding 750 c.c.	Excelsior sc., Norton sc., Rudge sc., A.J.S. sc., Bat sc., Clyno sc.	£79	6	£3 3 0
Exceeding 750 c.c., not exceeding 875 c.c.	Abingdon sc., Alldays sc., Campion sc., Enfield sc., Rex sc., Sunbeam sc.	£87	7	£3 13 6
Exceeding 875 c.c.	Bat sc., Chater-Lea sc., Matchless sc., Indian sc., Dot sc., Zenith sc.	£90	8	£4 4 0

Motor cycles of over 1,000 c.c. to be taxed at the rate of 10s. 6d. for every complete 125 c.c. or part thereof.

The above scale to be applicable to motor cycles purchased after January 1st, 1911.

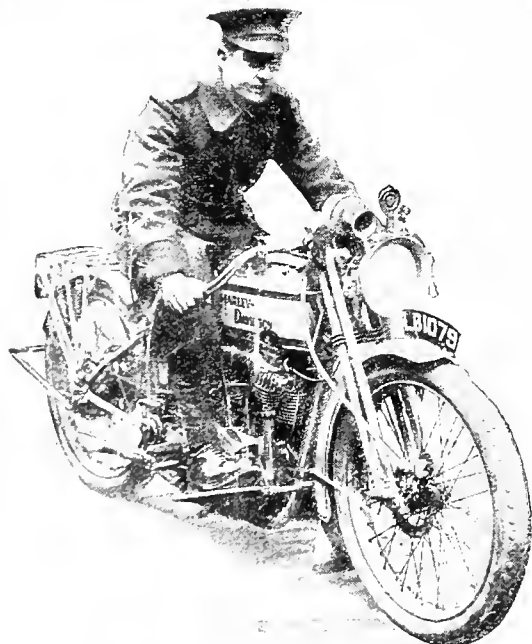
Reduction for old motor cycles: Motor cycles purchased before January 1st 1911, to be rated one class lower for every year or part of a year elapsed between date of purchase and January 1st, 1911. Onus of proof of date of purchase to rest on owner.

Another suggestion which has the merit of simplicity is a tax of £1 1s. per wheel, but the first proposal as set forth in the above table is preferred. Further, the A.C.U. urges the early reconsideration of all such taxes, and recommends a merely nominal tax—for statistical purposes—coupled with a tax based on the ton-mileage, e.g., a petrol or tyre tax for the purposes of revenue.

A final table shows the probable revenue which will be obtained by each method, the totals being as follow:

Government proposals (deducting 50%, the restrictive effect of such tax) ...	£229,820
Taxation by capacity (deducting 20%, the restrictive effect, and 1% rebate allowed on old machines) ...	£244,985
Taxation by wheels (deducting 25%, the restrictive effect) ...	£273,420

It is pointed out that the damage caused to the roads by the ordinary use of motor cycles is negligible, and it is urged that in no case should a tax on a motor cycle exceed the tax on a car.



L. Calvert (Westminster), winner of the unlimited class in the Public Schools championship hill-climb. There were only two starters in the class, and both were mounted on Harley-Davidsons.

# THE LEWIS ENGINE.

## A NEW DESIGN OF STRIKING ORIGINALITY.

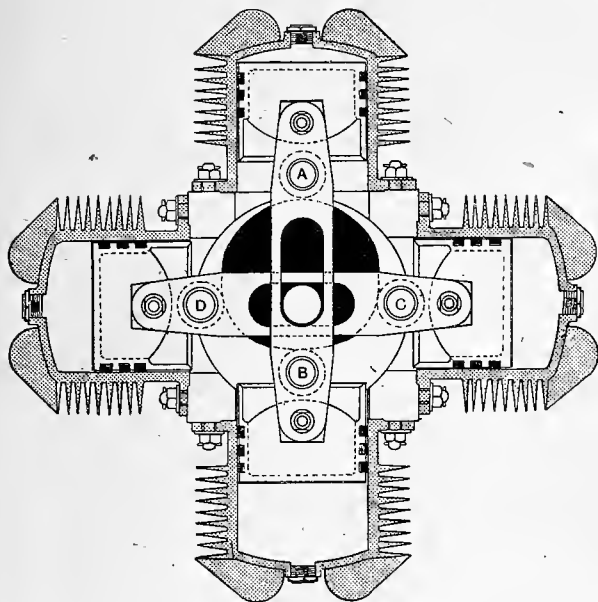


Fig. 2.—Section of the Lewis engine, showing how the pistons are joined in pairs.

**M**OTOR cyclists have been so accustomed to engines having cranks and oscillating connecting rods with their big-end and gudgeon pin bearings that the possibility of building an engine without these adjuncts has probably not occurred to many. Such engines have, however, been designed and built (we are not alluding to turbines) in two series, viz., steam and internal combustion engines, and differ from the usual type in the important features to which we have just alluded, e.g., the place of the crank is taken by an eccentric cam, the gudgeon pin bearing is entirely absent as the double connecting rods are fixed rigidly to the pistons; and, in fact, the usual methods of converting a reciprocating to a rotary motion have been entirely superseded in a most novel and ingenious manner.

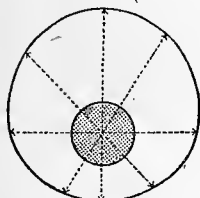


Fig. 3.—Irregular shaped cam driven by the rollers attached to the connecting rods.

be evident that both rollers could not be in contact with it during the whole period of revolution, for the diameter is the greatest chord which can be drawn in a circle; therefore, in fig. 2 the rollers A and B would touch the cam, but some play would be allowed to C and D. This would, of course, cause a knock, and so the cam is not made truly circular, but so constructed that the lines which pass through the centre of rotation (not the centre of the cam) shall all be equal in length (see fig. 3).

### Some Details of the Lewis Engine.

The engine to which we refer is known as the Lewis; this engine we recently had the pleasure of inspecting in Mr. Lewis's little workshop at Dinas, in the Rhondda Valley, and we can assert that we were much impressed by the ingenuity and originality of design. The engine we saw had two opposed cylinders, but it was so arranged that two more cylinders could be fitted at right angles. The system also admits of six or eight cylinders, but in every case the cylinders must be in pairs and set opposite to one another. The pistons are also connected together in pairs by rigid connecting rods, such as are shown in fig. 1, each connecting rod being constructed of two steel plates carrying two hardened rollers between them and having slots through which the main engine

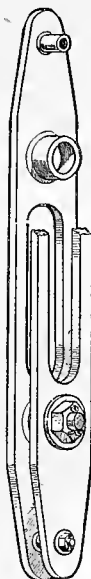
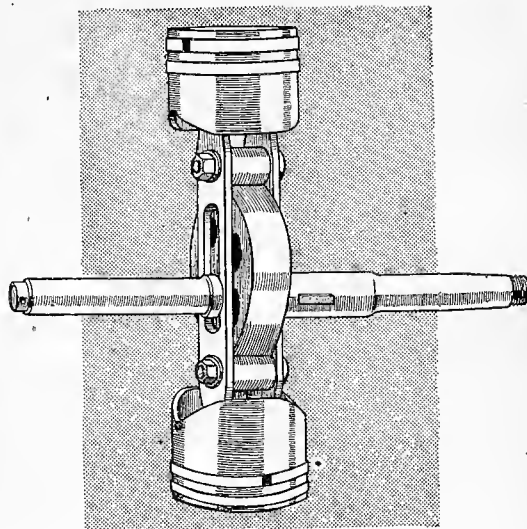


Fig. 1.—Double connecting rod to the Lewis engine



Pistons and eccentric cam showing how the reciprocating movement drives the main shaft

shaft passes. This shaft carries on its centre a specially shaped cam mounted eccentrically which takes the place of cranks. If the cam were circular in shape it would

Fig. 4.—Diagrammatic sketch of valve mechanism.

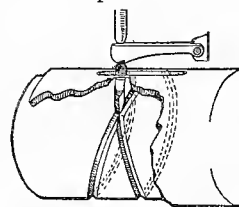


Fig. 4.—Diagrammatic sketch of valve mechanism.

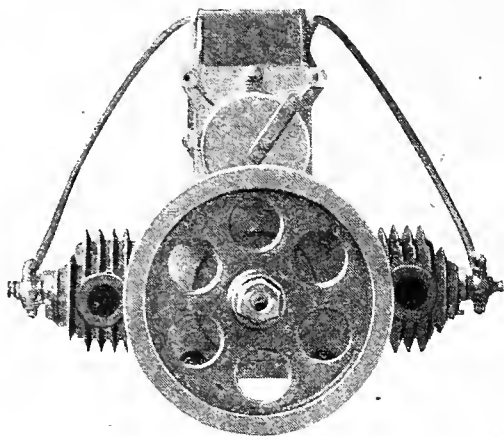
### Torque and Balance.

It will be evident that the direction of the piston thrust will always be through the centre of the engine, and that all the cylinders will be in the same vertical plane. It is also claimed that the shape of the cam gives a very even torque, and does away with the secondary forces which the angularity of the connecting rod causes to be present in the usual type of engine, and which cannot be balanced by a revolving weight on the flywheel. The balance of the four-cylinder engine should, therefore, be excellent.

The engine we saw had stationary cylinders and a rotating shaft, but it is quite possible to reverse this procedure and make the cylinders revolve. Owing to the small size of the engine, 12in. over all, there would be



## The Lewis Engine.—



The Lewis twin-cylinder engine.

no difficulty in fitting a rotary engine into a motor cycle frame, and a four-cylinder made on the four-stroke principle, having a bore of 2 in. and stroke of 1 in. (just over 200 c.c. capacity), is claimed to give 4 h.p. at 4,000 r.p.m.

The valves are operated by scroll cams (see fig. 4), which bring forward a peg once in every two revolutions of the engine; this peg lifts a tappet, which in turn raises the valve. All the exhaust valves are operated by a scroll on one side of the engine, and the inlet valves similarly worked on the other side. The flywheel is, of course, outside, and is about 6 in. in diameter. The weight of the four-cylinder engine (without magneto) is 21 lb.

**No Flywheel.**

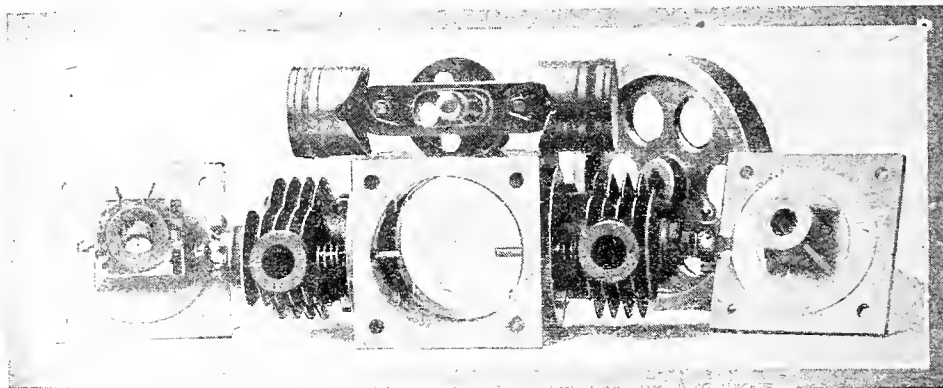
In the rotary model this weight can be still further

reduced, as a flywheel would be quite unnecessary, for the engine itself would take its place. Another point which is worthy of mention is that the construction of the engine admits of very large bearing surfaces, which, of course, mean very satisfactory wearing qualities.

Curiously enough, the Barry engine, which many of our older readers will remember as a design of much originality, also hailed from South Wales.

**A Rotary Steam Engine.**

At Mr. Lewis's workshop we also saw a most fascinating little steam engine of the rotary type, the case in which the engine revolved taking the place of the cylinder heads, the surfaces being ground true and made steam tight by a film of oil. This engine, which measures only 6 in. x 4 in., is said to be capable of exerting 4 h.p. at 7,000 r.p.m. with a steam pressure of 150 lb. per square inch, and it is so free from vibration that it can be run at this speed attached to a small stand and simply set up on a wall without any fixings. It can be reversed in a moment by throwing over the eccentric cams with a small lever. When this is done the engine quickly comes to rest and then starts up in the reverse direction. Such an engine, combined with a suitable flash boiler and condenser, should be ideal for a steam motor cycle.



The Lewis engine dissected, showing the two pistons, eccentric cam and other, parts.

**WELL EARNED RELAXATION FOR MUNITION WORKERS AND GROUP MEN.**

A group of competitors in the Sheffield Munition Workers' Easter Monday Trial, the results of which appeared in our last issue.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Herford Street, Coventry, and must be accompanied by the writer's name and address

#### Wheel-steering for Sidecars.

Sir,—Re your illustration in *The Motor Cycle* of the 20th ult., of George Brough steering a motor cycle combination from the sidecar, I should be glad if you could give me the address of any firm (if there is one) who make a speciality of fitting the above. I think it is a splendid idea, and will certainly have it fitted to my "turnout," if possible.

F.A.N.

Sir,—Will you please publish the following letter in reply to the many enquiries we have received re the sidecar steering? The conversion carried out by us is purely a freak one for the purpose of testing out experiments under adverse climatic conditions, with more comfort than would be possible if driving from the saddle. The conversion set is not on the market, and we cannot undertake to make similar alterations to readers' machines.

W. E. BROUGH AND CO.  
G.B.

#### Motor Cycle Taxation.

Sir,—I have read your interesting issue of the 13th ult., and would ask how great is the taxation of a slide valve, two-cylinder, double-acting, four-stroke engine, 52×26, of my own design now in construction, and intended to rate 4 h.p. at 4,000 r.p.m.

HUGO MOREN.

Bofors, Sweden.  
[The Treasury rating on this engine is 6.7, and consequently the tax will be £4 14s. 6d.—Ed.]

Sir,—If you can spare a little more of your valuable space upon the subject of the newly proposed taxes, I should like to state my views as to an equitable scale of charges, and they are as follow:

	£	s.	d.
Auto wheels ... ..	15	0	
Solo motor cycle up to 4 h.p. ... ..	1	5	0
Solo motor cycle over 4 h.p. up to 6 h.p. ... ..	1	10	0
Solo motor cycle over 6 h.p. up to 8 h.p. ... ..	2	0	0
Sidecars in all cases extra each ... ..	10	0	

These figures will not, of course, total up to anything like Mr. McKenna's estimate, but I make bold to say the yield in actual cash will be more than if it is attempted to collect an amount that is both unreasonable and unjust.

It will be noted that I have reduced the Auto wheel to 15s., as I consider that a great many more would be in use at the lower figure, for, as a matter of fact, 10s. 6d. (peace time) would be ample for it, and, further, I do not think my figures for motor cycles would curtail any usage from a licensing point, but the excessive price of petrol must be considered as a factor in curtailment, and am absolutely certain that the proposed new and exorbitant taxes will seriously affect new licences and revenue accordingly.

I would like to suggest that a protest meeting be held on some Saturday afternoon or Sunday morning on Wimbledon Common, or similar open space, and a resolution taken, petition signed, and duly presented to the proper authorities. Perhaps some motor cyclist *au fait* with the procedure will come forward and help; anyhow, if something is not done quickly, we as a body are going to suffer badly and to no purpose.

JOHN J. LEONARD.

Sir,—I notice in *The Motor Cycle* of the 27th ult., page 410, you say, referring to taxation, that "no recommendation was likely to be adopted which materially decreased the revenue which the Treasury expected to obtain." If the Treasury fixes an unreasonable sum, then it will not be got. The proposed tax on railway tickets was dropped like a hot potato, and several millions of revenue lost in twenty-four hours. Why did the Treasury let all this go? And why is the relatively small sum expected from motor taxation such a fixed and unalterable quantity? The fact is that if motor taxes are appreciably increased the revenue will be less. £4 14s. 6d., or anything near it, on big twins will knock out practically all of them. I do not think that a tax of anything over £2 on any machine will bring in more revenue. It may bring in less. The Chancellor will not get more than motorists can pay. The newspapers tell us to be very careful to economise on petrol. What about the thousands of gallons used by the L.G.O. Co. on pleasure trips at Easter?

A. W. BLACKMORE.

#### New Zealanders' Ideal Motor Cycle.

Sir,—Can you tell me where I can be likely to purchase a motor cycle having the under-mentioned features for use in New Zealand? There are a large number of keen motor cyclists in the N.Z. Expeditionary Force who have acquired a great amount of knowledge from their experiences of Colonial conditions, and I have in my spare time made a collection of their opinions as to the ideal machine for New Zealand and Australia, where the summer heat is great and reliability of great importance.

Engine.—5 h.p. twin, horizontal cylinders 70×90 mm., offset, say, 4in. to avoid side thrust under power stroke. Cylinders of copper alloy, with steel liner or inner wall and valve seats. Overhead valves of large diameter and lift, and large bearings in every case. Single flywheel outside crank case of exceptionally large diameter and heavy rim. (This is an important feature in the opinion of most Colonial riders.)

Automatic sump lubrication, in addition to the usual tank and pump. The machine to have a long wheelbase and rear springing. The carburettor to be fitted with hot air service.

The pistons to be made of aluminium alloy. Transmission by Coventry silent chain to large proportioned three or four-speed gear box with adjustable countershaft pulley of large size, drilled to improve belt grip for leather belts in wet weather. The clutch to be of the internal cone type faced with Raybestos.

The carrier to be extremely rigid and strong. Mudguards, to be at least 4in. wide and very strongly made. Disc wheels, 30in.×3in., with perfectly watertight hubs. Magneto of British make. Forks to be very efficient, and to absorb horizontal and vertical shocks.

Abbassia, Cairo, Egypt

L. C. GREEN.

#### Top Feed Carburetters.

Sir,—With reference to the last comment made by Messrs. Brown and Barlow, Ltd., in your issue of April 27th, they say that if the float chamber lid and the petrol union are tightened up with the same pressure there is no fear of the float chamber lid coming undone when undoing the petrol

union because of the difference in the diameter of the thread and frictional resistance. With that I do not agree. If the frictional resistance is greater on the float chamber lid than on the petrol union when unscrewing it will also be greater when screwing it on, therefore if equal pressure is used when screwing them on the frictional resistance will make no difference when unscrewing. I think two spanners should be used when disconnecting the petrol union and float chamber of a top feed carburettor.

G. WELFORD.

Sir,—In your issue of 27th April I notice a lengthy letter from Messrs. Brown and Barlow, Ltd., in which they endeavour to show clearly the several advantages (?) of "top-feed" over "bottom-feed" carburettors. Their arguments concentrate round one point, and that is the disadvantages of balance weights.

I have noted the construction of carburettors of the last two or three years in which there are no balance weights at all, and the action of the needle is merely the reverse of the present-day "top-feed" variety. Balance weights are long out of date. In face of this evidence I think the arguments set forth by Messrs. Brown and Barlow crumble down. In reality they contrast the modern "top-feed" with the "bottom-feed" of several years ago! Until more convincing arguments are put forward, I, personally, will stick to the "bottom-feed" type.

JOHN W. WALKER.

#### Road Tests of a Cheap Fuel.

Sir,—Referring to your contributor's test of my carburettor and cheap fuel, it is very gratifying to find that the mileage per gallon is better, and that the carbon deposit is less than with petrol, and practically does not exist. Apparently the only objection he found was the objectionable knocking.

I would like to say that your test, in my opinion, was the most severe one that you could possibly apply to this apparatus. To begin with, a single-cylinder  $3\frac{1}{2}$  h.p. machine, loaded up with a sidecar and 20 stone of passengers, used in the really terrible weather that was prevalent when the tests were made, would disclose the slightest defect in the system, if there were one, and the total defect disclosed was this knocking of the engine at full throttle. In cases like this it is well to fit a larger main jet, which stops the knocking to a very great extent; and in this case extra air should be used, and directly the knocking starts on a hill the air valve should be shut and the knocking will stop, as the knocking is caused by the cylinder getting the full accurate charge, and consequently a very heavy explosion in the cylinder. A  $3\frac{1}{2}$  h.p. single-cylinder machine is the worst one possible for this system. I have tested scores of machines during the last month or two, and can safely say that on a modern twin engine and small single-cylinders there is absolutely no suspicion of knocking.

I would very much like your contributor to give further experiences on a 3 h.p. Enfield which I have, and a two-stroke Calthorpe, and I will defy any rider to tell the difference under every condition of the road. Of course, I will be the first to admit that this cheap fuel is not quite as good as petrol, but the only real objection to it is the little difficulty in starting when cold; but almost any engine will start cold if petrol is squirted through the extra air valve, and by the time it is used up the cylinder will be warm enough to run on the cheap fuel.

Naturally, supposing the rider had the choice of petrol and this fuel at the same price, he would unhesitatingly choose petrol, but as petrol is now practically unobtainable, and this cheap fuel costs half the price of petrol, runs more miles to the gallon, is cleaner, and, if anything, more flexible, it seems to me there are overwhelming advantages in using it. If further tests are made on the two machines referred to, I would suggest that these machines are not overloaded but tried under ordinary riding conditions; but, of course, I would leave the matter entirely in the hands of your exceptionally capable contributor, and I think he will be able to say that both these machines can be raced at full speed with a wide open throttle without the slightest suspicion of a knock. I would also like him to try the fuel on an 8 h.p. Sunbeam and a 6 h.p. A.J.S., and I believe he would find that the knock on these machines was non-existent at any speed.

C. BINKS.

#### Four-cylinder Motor Cycles.

Sir,—After reading H. E. Thompson's very interesting letter *re* four-cylinder engines, I feel it would be a great privilege, not only to myself, but to numbers of others, if your contributor could be prevailed upon to give further details and outlines of the manner in which he has improved the F.N.

There are countless people, whom I know personally, that would prefer a four-cylinder machine if the various weaknesses of this type could be improved; but as these weaknesses obtain they are content to ride singles. Personally, the three points which require very serious attention are in the following order of importance: (1.) Mechanical inlets. (2.) Pump oiling, mechanical. (3.) Spark plugs in centre of cylinder head.

P. F. LEE.

Sir,—With reference to the letter from Mr. H. E. Thompson in your last issue, I have a 1913 5 h.p. F.N. motor cycle with central intake induction tube and two-speed gear. On the high gear at slow speeds the drive is jerky, which, I think, is due to the automatic inlet valves and the fixed magneto timing. There is also a sluggishness in picking up on slow speeds on top gear, and the clutch has sometimes to be slipped. I should be much obliged if your correspondent would explain the temporary attachment for working the inlet valves mechanically. If he could give working drawings I would esteem it a favour, as I am in a position (having a small lathe and tools) to carry out his suggestions. With the exceptions mentioned above, the working of the engine is perfect.

CHAS. H. VOWELS.

#### The Petrol Committee.

Sir,—In view of the troubled times in which we are living, and the fact that the Government seems to have an inclination to damage the motor cycle industry seriously, I am writing to know if the names of any of the gentlemen appointed on the Petrol Committee are known as being in any way connected with the industry, or whether by any other act or deed they have in the past proved themselves to be men likely to be able to deal in a fair manner, from knowledge gained, with what constitutes or does not constitute a fair proportion of petrol for the use of motor cycle and car owners.

I suggest to you that it is a matter you should interest yourselves in very keenly, since apparently whatever this Committee recommends will be carried out by one or other of the great Government Departments. Therefore, it behoves us as a body of motorists to "kick" if we find that the people appointed on this Committee are not suitable members.

Why not some one member of the "trade" on the Committee?

MANUFACTURER.

#### A Satisfactory Tour.

Sir,—I beg to thank you for the route you sent me, "High Wycombe to Torquay."

We found it excellent, with the exception of a few miles between Wilton and Shaftesbury. We did not go into Exeter, but turned left over Countess Weir Bridge, and then up over Halden and down into Kingsteignton. We came back by the coast road *via* Lyme Regis and Dorchester; the only bad bit on that road was between Reading and Basingstoke, but taken on the whole it had not nearly such a good surface as the Shaftesbury route.

A few items might interest you. We could get no petrol in Salisbury, but found plenty at Shaftesbury. There had been a shortage at Dorchester, several cars being held up on the Saturday. There was a pretty useful water-splash between Newbury and Andover, but we came through it all right. I should think at times it might be awkward.

I found the 7-9 h.p. Harley-Davidson and sidecar extremely comfortable, and *not* geared too highly, as seems to be a pretty general opinion.

H. E. JACKSON.

#### SUMMARY OF CORRESPONDENCE.

Several correspondents have taken exception to the remarks of "Anglo-Indian," and write pointing out that others might have been earning 6s. a day if they had enlisted at the commencement of hostilities. They show that the 6s. a day man is worthy of his hire, in view of his great responsibility, and the fact that he was a skilled man when he joined up. [This correspondence is now closed.—Ed.]

# QUESTIONS & REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Worn Pulley Flanges.

**Q.** I bought my first motor cycle new last August. After having run somewhat under 1,800 miles the pulley flanges have become badly worn. (1.) What is the probable cause of this? (2.) Is this normal, and shall I need to renew the flanges every 1,800 miles run? (3.) Should I get more than 33 m.p.g. with sidecar in hilly country? The motor cycle is  $3\frac{1}{2}$  h.p., fitted with a three-speed hub gear.—J.A.

(1.) Probably the cause is road dust and grit; or you may have allowed the belt to slip badly. (2.) Possibly they were made of too soft material; they should certainly last longer than this. (3.) Of course, you ought to get more than 33 m.p.g. with a sidecar with a  $3\frac{1}{2}$  h.p., even in hilly country. We should say the consumption should be 60 to 70 m.p.g. Try fitting a smaller jet, and make sure all adjustments, such as valve springs and tappets, are correct. The clearance between tappet and valve should not be greater than .4 mm.

## Misfiring on One Cylinder.

**Q.** I possess a 1914 Douglas, which has just been overhauled. Since it has come back it will only fire on one cylinder till a good speed is obtained, and it does this on both high and low gears. But when on the stand both cylinders fire quite regularly. Whether I advance or retard the ignition makes not the slightest difference to the engine. How many drops of oil per minute should the engine get when running at a moderate speed on flat roads?—H.B.R.

Your symptoms point rather to the fact that an air leak exists between the carburetter and one of the cylinders, the result being that unless the engine is running fast the mixture is too weak to fire properly. Look to all the induction pipe unions and bind any doubtful joints with adhesive tape. Look to all the valve tappets and make quite sure all the valves are seating properly and that the tappet clearance is not more than .4 mm. A valve sticking or tappet not allowing any clearance would easily cause the symptoms mentioned. You should also examine all the following points: See that the carbon brushes of

the magneto are in good order; and that the high-tension wires are not shorting anywhere. Try a new plug in the offending cylinder, and also examine the magneto contact breaker and see that the points are breaking correctly on both cams; the points should separate .4 mm.

## Oil Leakage.

**Q.** I have a  $3\frac{1}{2}$  h.p. single motor cycle, and the oil comes out of the main bearing somewhere behind the pulley and splashes all over the belt and that side of the machine. I have taken the engine down and examined the ball race, but cannot see anything wrong. I am sure that it is not because it is worn, because the machine has not done 4,000 miles, and it has been taken great care of. I have tried a felt washer between the crank case and the pulley, but as soon as it gets saturated the oil leaks as badly as ever. The air release hole through the crankshaft is quite clear. There are only about six or eight balls in the race, and they appear to be caged in. I have shown it to several motor engineers, and they cannot understand it at all. I use the best lubricating oil.—H.D.R.

The trouble might be cured by fitting an extra relief valve. This, as well as a felt washer should be of great assistance to you. In all probability, although the engine has only run a short distance the bearing may be damaged, and so allow an excessive amount of oil to pass. We would advise you to have the engine down and make sure the bearing is absolutely sound.

## Tappet Clearance.

**Q.** (1.) My  $3\frac{1}{2}$  h.p. 1913 motor cycle has ordinary clearance in the exhaust tappet when hot, but when cold there is no clearance at all. The machine starts all right and runs well. The clearance appears after a minute's running. I shall be glad if you can offer me some explanation. (2.) In *The Motor Cycle* of March 9th the action of a four-stroke engine is illustrated. You say that the exhaust opens  $\frac{1}{2}$  in. from the bottom and closes at the top, and you say this is 225°. I can make it only  $24+180=204^\circ$ .—R.G.H.

(1.) The reason you have clearance when the engine is hot and not when cold is

that when hot the cylinder expands and grows longer, and as the tappet keeps cooler it does not expand to the same extent, and this causes the clearance, which would be considerably greater if there were clearance before the engine became hot; this symptom is contrary to usual experience. It is usually found that the clearance becomes less when the engine is hot. (2.) The exhaust valve on most engines commences to open when the crank pin is about 45° from the bottom of the stroke, which in a normal sized engine means that the piston is roughly  $\frac{1}{2}$  in. from the bottom of its stroke. The valve remains open until the top of the exhaust stroke is reached. You will therefore see that the opening consists of one complete stroke of  $180^\circ + 45^\circ$ , which equals  $225^\circ$ .

## The Silencing Regulations.

**Q.** My machine is a  $3\frac{1}{2}$  h.p. 1912 single-cylinder, which I purchased in June, 1915. It is my first motor cycle, and I have ridden it quite regularly without any alteration to any part of the engine whatever. On Sunday, April 9th, I was stopped by a police officer, who asked why I had got a cut-out fitted. I replied that I had not to my knowledge, and I had never been stopped before or even cautioned. He then pushed his pencil into the hole in the end of the silencer, and said I had no baffle plates fitted. There are two holes in the end of the silencer, about  $1\frac{1}{2}$  in. diameter, which have always been there. I have an extension pipe fitted from the silencer, which is 2ft. long by  $1\frac{1}{2}$  in. diameter. Should these holes be filled up? I may add that there is no excessive noise when the engine is fully opened out. The officer even admitted that he would not have noticed me had not the friend he was talking to called his attention to me.—H.J.C.

Whether or not the silencer had baffle plates in, was not the business of the policeman. What you have to do is to arrange matters so that the gases exhaust into an expansion chamber before issuing into the open air. On the other hand, no matter what design of silencer is fitted, you may be summoned if the machine makes what is, in the opinion of a police officer, an excessive noise. A cut-out is illegal.

## PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.



### Mysterious Pulling Up.

**?** I have a  $3\frac{1}{2}$  h.p. three-speed single, standard roadster, 1913 model, which did over 10,000 miles in 1913, since when I have had it abroad; but, owing to lack of roads, Active Service, and what not, I have not ridden more than 500 miles at the outside. In very hilly country in Ceylon, rising from sea level at Colombo to 6,000 feet at Newara Elia, the machine proved very unsatisfactory, jibbing at hills, which, though formidable enough, should have been negotiated by a three-speed, even with my weight (14 st.) After running for a short time, up a steep hill, the machine would behave as though the switch had been shut off for perhaps three seconds. (N.B.—I have no switch fitted.) Of course, by this time all momentum, or at any rate most, was lost, and I had to start again. It started easily and well, as though it had never had a trouble in its life; but, sooner or later, the same thing happened, generally at the next steep hill, but sometimes on the (comparative) flat. Always the same thing occurred. I tried the following: (a.) Tested the ignition, and found it correct, good fat spark, etc., but, nevertheless, tried several new plugs. (b.) Tested tank for grit, carburetter for grit, took out and cleaned everything connected with the petrol supply, dried out the tank in the hot sun, and made quite certain that there was no water in the petrol. Also saw that the union at each end of the petrol feed pipe was correctly fitted, and square, and satisfied myself that there was no leakage. Also tested needle valve, float, and everything connected with the carburetter, and found all correct; also fitted a filter which was not required. (c.) Tested compression, and found it good; valves not pitted; springs normal. (d.) Satisfied myself that the valves were not sticking in the guides, that the valves were functioning properly, that the exhaust was clear and not choked up, and the silencer clean. (e.) Tested the mechanical parts of the engine, flywheels for truth, and bearings correct (the machine had a thorough good overhaul, bearings renewed, etc., at the end of 1913). (f.) Tried larger and smaller jets, but got no appreciable difference in results. (g.) Tried over-oiling and under-oiling; nothing gained except the usual dirty engine in the former case; but anyway, was convinced that there was no sort of seizure, the stop being as gradual as the gradient would allow. On leaving the hilly country the symptoms disappeared, but as there was no hill down at Colombo this was no proof, and did not satisfy me.—H.L.C.M.

As you have apparently attended to practically everything that can be done it does not leave us many items to suggest. Your description of the trouble rather points to misfiring or pre-ignition, but why the former should only occur in the hilly districts is puzzling and difficult to solve without seeing the machine. If the plug, high-tension wire, carbon brush, and holder are in sound condition, the fault may be in the contact breaker. Make sure the fibre bush in which the

contact breaker rocker works is not swollen and causing the rocker arm to stick. Pre-ignition sometimes causes similar trouble to that which you describe, and might be due to either a faulty plug or a dirty engine. Choose a single point plug with substantial electrode, and of good make. If you take your cylinder off again make quite certain that the piston and connecting rod are quite true with the cylinder, and not leaning very slightly over to one side.

### Failure to Take Advance.

**?** I have a  $2\frac{1}{2}$  h.p. two-stroke motor cycle fitted with variable ignition. When I bought the machine it would always start and run on full advance. After a time it started misfiring, and would not take any air. I took everything down and cleaned the engine out, and took up the slack in the magneto chain. I find now that it refuses either to start or run at full advance. I have to retard the spark about one-sixth of an inch. It starts very easily and runs well, but as soon as I advance beyond this the firing stops immediately. I have spent hours trying to remedy this, but all to no avail. The make and break seems to be perfect, and yet it seems to me to be where the fault lies.—A.A.

You had better re-check the timing, which, in the case of a two-stroke, should be as follows: Place the piston exactly on top of the compression stroke, and connect up the magneto with the points just broken and the ignition lever fully retarded. Possibly, by some means or other, you have upset the timing. Make quite certain that when the ignition lever is fully advanced the contact points still break properly, and that when in this position there is nothing that will foul the switch terminal and so cause a

short circuit. If all these points are checked and found correct there is no reason why the machine should not run with ignition fully advanced.

### RECOMMENDED ROUTES.

ACCINGTON TO COVENTRY, VIA BUXTON.  
—J.H.K.

Accrington, Haslingden, Rawtenstall, Rochdale, Oldham, Ashton, Glossop, Chapel-en-le-Frith, Buxton, Bakewell, Matlock, Derby, Melbourne, Ashby-de-la-Zouch, Atherstone, Three Pots Inn, Wolvey, Coventry.

ACCINGTON TO COVENTRY, VIA WARRINGTON.—J.H.K.

Accrington, Blackburn, Chorley, Wigan, Warrington, Tarporley, Whitechurch, Hinstock, Newport, Watling Street, Weston, Gailey, Brownhills, Castle Bromwich, Stonebridge, Coventry.

HULL TO MANCHESTER.—T.F.

Hull, South Cave, Howden, Barmby, Selby, Chapel Haddesley, Kellington, Knottingley, Pontefract, Hemsworth, Barnsley, Penistone, Mottam, Stalybridge, Ashton-under-Lyne, Manchester. 100 miles (approximately).

BRISTOL TO EDINBURGH.—D.S.

Bristol, Gloucester, Tewkesbury, Worcester, Kidderminster, Bridgnorth, Stockton, Wellington (Cock Inn), Crudgington, Hodnet, Whitechurch, Beeston Castle and Tarporley Station, Four Lane Ends, Eaton, Cotebrook, Stretton, Warrington, Hulme, Newton, Wigan, Preston, Lancaster, Carnforth, Kendal, Penrith, Carlisle, Longton, Canobie, Teviothead, Hawick, Selkirk, Galashiels, Heriot, Fushiebridge, Edinburgh. Approximately 380 miles.



MIDLAND EASTER TRIAL. (See last issue.)

Rex Mundy ( $3\frac{1}{2}$  h.p. Sunbeam) approaching the top of Rising Sun. The competitor on the right skidded completely round in the loose stones.

Every motor cyclist who uses it  
is loud in his praise of it.

*The*  
**Grado**  
**Multi-Gear**  
*with Free Engine*

**T**HIS variable pulley for single-gear machines with belt drive is proving its value daily. Its advantages are so great and its cost so reasonable that no motor cyclist should deprive himself of the benefits derived by fitting this wonderful invention.

Briefly summarised, this is what it does:

It positively stops all belt slipping!

It starts your machine like a car!

It takes your machine and sidecar up hills impossible without!

It can be fitted in two to three hours to standard belt driven machines—Triumphs, Bradburys, Precision, B.S.A., J.A.P., etc.

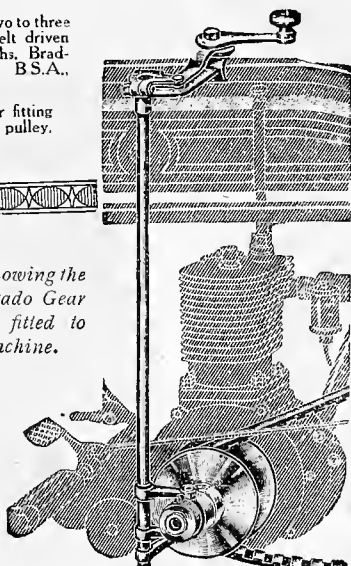
Full instructions for fitting supplied with each pulley.

It gets you safely through thickest traffic!

It ensures safety over greasiest roads!

—In fact, it turns work and danger into a pleasure!

*Showing the  
Grado Gear  
as fitted to  
machine.*



**Read these typical letters.**

Mr. J. PEARMAN, The Bungalow, Chadwell St. Mary, near Grays, Essex, April 5th, 1916, writes:

I take this opportunity of adding my share of appreciation of your pulley. Within its range of gears it is certainly more convenient than a two or three-speed gear box; and even under trying conditions I have not experienced belt slip, even with a fairly heavy sidecar attached to the bicycle.

I am surprised to find that manufacturers have not included it as a standard fitting to their otherwise fixed gear machines.

Mr. S. F. COOK, 45, Lower Westgate Street, Gloucester, writes:

Gentlemen,—I have had one of your gears fitted on my  $3\frac{1}{2}$  h.p. Triumph motor cycle for the past twelve months, and have found it very satisfactory. You may make any use you wish of this letter.

Mr. JAMES MASON, 164, North Street, Wolverhampton, September 1st, 1915, writes:

Gentlemen,—After using your Grado Multi Pulley with free engine for six months, I feel that it is my duty to inform you that it has given me satisfaction, and I am more than pleased with it, as I have been able to climb with my 1905  $3\frac{1}{2}$  h.p. Triumph all hills I have met with, taking a coach-built sidecar and passenger. I am now able to take roads with every confidence which before having your pulley fitted to my machine I was compelled to avoid. I shall certainly recommend your pulley wherever I go.

Messrs. the Grado Manufacturing Co.,  
64, Pershore Street, Birmingham.

Mr. G. BARFF, Saracen's Head Inn and Restaurant, Warburton, Cheshire, December 3rd, 1915, writes:

Dear Sirs,—Have received pulley all right. A friend of mine has been all over Wales with one on a light machine and sidecar, which was impossible before he fitted it to his machine.

Mr. H. RHODES, Fanshall House, Pontefract, February 7th, 1915, writes:

Dear Sirs,—I have recently had one of your Grado gears attached to my  $3\frac{1}{2}$  h.p. Bradbury so that I could take a sidecar. I must say that it has surprised me, because I was wondering how on earth it could grip the belt on low gear, but it does, and takes the lot of us up hills all right. I think it is a fine and simple invention, and it seems to me it is going to be reliable, because there is no fancy watch mechanism about it.

P.S.—If this is any good you may use as testimonia.

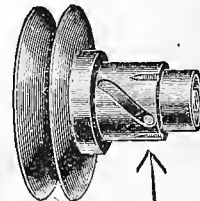
Mr. John F. BROWNE, Bridgetown, Co. Wexford, August 23th, 1915, writes:

Dear Sirs,—I am obliged for yours re the pulley. I must say it is not only a charming invention, but most valuable, and I am delighted with it.

**We have hundreds more.**

**PRICES.**

Pulley complete (as illustrated), bored to suit engine-shaft up to $4\frac{1}{2}$ h.p.	£3 3 0
Up to 6 h.p. . . . .	£3 10 0
Lightweights . . . . .	£2 10 0
Pulleys with new ball thrust bearings:	
Lightweight . . . . .	£3 5 0
Up to 4 h.p. . . . .	£4 0 0
Up to 6 h.p. . . . .	£4 10 0



*THIS CURVED SLOT ensures the belt never slipping on the lowest gear.*

**C.** We can supply a Special Pulley for engine with Extending Crank Bosses, like the J.A.P., old Rex, Minerva, etc., for 10/- extra; recess up to  $1\frac{1}{2}$ in. diameter. Up to  $2\frac{1}{2}$ in. diameter, if necessary. 12/- extra.

**The GRADO MANFG. CO., 64, Pershore Street, BIRMINGHAM.**

Telephone—1187 Midland.

*In answering this advertisement it is desirable to mention "The Motor Cycle."*

# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### A.J.S.

A.J.S., new 1916, 6hp., and 2½hp. models actually in stock.—Moss, Wem. [X8748]

A.J.S. Models in stock, with sidecars.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

1916 A.J.S. 6hp., brand new; £84.—Hicking, Small-dale Bottom, Bradwell, near Sheffield. [4542]

A.J.S., 2½hp., 2 speeds, in real nice order; £28.—Perry and Co., 337, Euston Rd., London. [4798]

1916 A.J.S. 4hp. Combination, in stock.—Williams, A.J.S. Expert, Chapel Ash Depot, Wolverhampton. [X8677]

A.J.S., 1914, 2½hp., 2-speed, clutch, watch, complete accessories; £37; owner on active service.—Apply, Haines, 169a, Lower Clapton Rd., N.E. [4736]

A.J.S., 1914, 6hp., detachable wheel, cane sidecar, wind screen, curtains; £65.—Apply (where on view), Sunbeam Depot, 57, Holborn Viaduct, E.C. [4677]

A.J.S., 1914, 2½hp., 2 speeds, clutch, kick starter, new owners, all accessories, overhauled and re-enamelled; £39.—Lieut. Clarke, 22, Palace Rd., Streatham Hill. [4526]

A.J.S. 1912 6hp. Twin Combination, 2-speed, countershaft gear, clutch, and kick starter; £48.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [4117]

## Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone: 766.

Telegrams: "Perfection."

### NEW 1916 MODELS.

LEVIS, 2½ h.p., 2-stroke .....	£32 0
SUNBEAM, 3½ h.p., 3-speed .....	£73 10
EXCELSIOR (American), 7 h.p., 3 speeds ..	£75 0
GALTHORPE Minor, 2-seater .....	185 gns.
NEW IMPERIAL, 2½ h.p., variable magneto	£38 0
DOUGLAS MODELS.—Orders booked now.	

### (U.S.A.) EXCELSIOR,

1916, 7 h.p., 3-speed model, 84×89, countershaft gear chain drive, mechanical and hand lubrication, high-tension magneto, multiple-disc clutch with dual control, kick starter, 2 gallons petrol capacity; £75.

Exchanges quoted. Easy Payments arranged. Sole Yorkshire distributors. Trade supplied.

### NEW 1915 MODELS.

*CONNAUGHT, 2½ h.p., 2-speed .....	£41 16
*WOLF-J.A.P., 2½ h.p., 2-speed .....	£38 0
*ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke ..	£36 10
*ROYAL RUBY-J.A.P., 2½ h.p., 2-speed ..	£39 10
*ROYAL RUBY, 6 h.p., 3-speed .....	£87 0
U.S.A. EXCELSIOR, 7 h.p., dyn. lighting, etc.	£71 10
*Cash offers wanted.	

### PERFECTION SIDECARS

to suit American Excelsior and Harley-Davidson machines, 28 x 3 Dunlop tyre, grey coach-built body and chassis .....

£13 10

### SOLO MACHINES.

1915 4½ h.p. 2-speed LINCOLN-ELK, as new	£38 10
1913 3½ h.p. ROVER, 3-speed .....	£37 10
1913 3½ h.p. F.E. RUDGE .....	£26 10
1913 3½ h.p. ROVER, Grado gear .....	£27 10
1912 3½ h.p. 2-speed TORPEDO .....	£19 10
1912 3½ h.p. ZENITH-GRADUA .....	£26 10
1912 3½ h.p. 2-sp. BRADBURY, chain drive ..	£29 10
1912 3½ h.p. 2-speed F.E. PREMIER .....	£27 10
1912 2½ h.p. DOUGLAS, kick start .....	£21 10
1912 3½ h.p. 2-speed F.E. HUMBER .....	£26 10
EXCELSIOR, 3½ h.p., 3-speed, Druid forks ..	£19 10
KERRY, 3 h.p., magneto, Saxon forks .....	£12 10
5½ h.p. Magneto REX, spring forks .....	£12 10
N.S.U., twin, 2-speed, spring forks .....	£15 10
TRIUMPH, 3 h.p., magneto, new tyres .....	£18 10
REX, 5½ h.p., 2-speed, wants attention .....	£12 10
P. & M., 3½ h.p., 2-speed, chain drive .....	£27 10
S.P.K., 3½ h.p., 3-speed countershaft .....	£25 10
REX, 1910, 5-6 h.p., 2-speed, F.E. ....	£22 10
REX, 1909, 5-6 h.p., 2-speed, F.E. ....	£18 10
REX, 3½ h.p., magneto, spring forks .....	£11 15

### SIDECAR COMBINATIONS.

Brand New 6 h.p. REX Sidette .....	£69 10
1914 3½ h.p. 3-speed ARNO and Sidecar ..	£36 10
1914 6 h.p. REX Sidette, almost as new ..	£53 10
W.C. WILLIAMSON and Sidecar (new) ....	£89 15
1913 7-9 h.p. QUADRANT and Sidecar .....	£49 10
1912 3½ h.p. 2-speed PREMIER and Sidecar	£33 10
1910 3½ h.p. 2-speed REX and Sidecar .....	£24 10
3½ h.p. 2-speed P. & M. and Sidecar .....	£19 10
REX 5½ h.p., 2-speed, and Sidecar .....	£22 10

### MISCELLANEOUS.

New 8 h.p. W.C. WILLIAMSON Cy-cl-ca	£126 0
New RITZ 4-cyl. 2-seater Light Car .....	£145 0
1915 FORD, 2-seater, detachable wheels ..	£85 0
1915 No. 2 Grand Prix MORGAN .....	£115 0
MORGAN, 1914, hood, screen, lamps, speedometer, overhauled and repainted .....	£79 10
G.W.K., 2-seater, all accessories .....	£92 10
ROVER 8 h.p. 4-seater, all on .....	£59 10
RENO 15 h.p. 4-cylinder Touring Car .....	£65 0
PREMIER 7-9 h.p. 2-seater Light Car .....	£67 10
1916 12 h.p. New Type OVERLAND .....	£225 0
New Mechanical Horns .....	17/6
New Acetylene Tail Lamp, post free .....	1/4

Cash Offers Wanted.

WANTED.—Second-hand Douglas, for cash.

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### Alldays.

ALLON.—All models on view; send for catalogues.—Colmore, 44, Finsbury Pavement, City. [4828]

1915 8 h.p. Alldays Combination, 3 speeds, lamps, etc.; £60.—H. Wright, Arlesley, Beds. [X8741]

ALLDAYS Allon, all models: immediate delivery: easy terms 2½ extra.—Referee Cycle Co., 332, High Holborn. [0763]

ALLDAYS Allon, 1916, 2-stroke, 2 speeds, brand new, must be sold; what offers?—Hudson, 326, Euston Rd., London. [4796]

ALLDAYS Matchless, 2-stroke, Stewart speedometer, climb anything; £20, or exchange.—H.S., 33, St. Stephen's Rd., Bow, E. [4610]

ALLON, 2½hp., 2-speed countershaft, clutch model; cost £48 with accessories last month; powerful, speedy, and absolutely perfect throughout; accept £33/10.—Pears, Oculist, Kingswood, Bristol. [X8633]

ALLDAYS Allon 2-stroke Motor Cycles from £34 to £52/10; early delivery; deferred terms from one-quarter down, balance by 12 monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Alldays Allon motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4057]

### Antoine.

ANTOINE, 6hp., nearly new sidecar, 2 speeds, Bosch, smart turnout; seen running, trial; £18/10.—Spechley, 45, Church Rd., Acton. [X8737]

### Ariel.

ARIEL 1914, 3½hp., countershaft 3-speed, Ariel coach sidecar; £45.—58, Castle Bar Rd., Ealing. [4237]

3½hp. Ariel, perfect, fast, good tyres; bargain; £19/10; exchange.—J. Rodway, 149, Merton Rd., Wimbledon. [4705]

2½hp. Ariel, mag., B. and B. spring forks, good 26 x 2½ tyres, very low; £10, offers, or exchange.—Ginn, Carleton, Carlisle. [4727]

ARIEL, 1916, all models in stock; ladies taught free by lady tutor; write for deferred payments terms; Ariel's special agent.—Jones, Garage, Broadway, Muswell Hill. 'Phone: Hornsey 2562. [4360]

6hp. Ariel Combination, latest model, twin, countershaft 3-speed gear, Lucas lamps, horn, accessories, carefully used, expert examination invited; bargain; £65.—Inglewood, Gravelly Hill North, Birmingham. [X8426]

ARIEL, 3½hp., 1912, semi-T.T., fast and flexible, multi gear, free engine, complete, this machine has just been overhauled and re-enamelled and plated by the makers at a cost of £12, and is honestly worth £35; accept £25, very genuine bargain.—Layton's Garage, Bicester, Oxon. [X8715]

### Auto-Wheels.

UTO-WHEEL, quite new, perfect condition, cycle attached; any trial; 13 gns.—Apply, 81, Culvert Rd., Battersea. [4776]

WALL Auto-Wheel for sale, very little used, in good condition; accept £10.—Hairsine, Warwick House, Eastington, Brough. [X8580]

## MOTOR CYCLES FOR SALE.

## Auto-Wheels.

**A**UTO-WHEEL de Luxe; £15/15, 28/3 monthly; converts any cycle to a motor.—Juno Showrooms; 248, Bishopsgate, London. [4805]

**A**UTO-WHEEL, good condition, with Premier 3-speed cycle, complete; £9, or would separate.—Ansell, Whitehall Rd., Gray. [X8535]

**B**.S.A. Auto-Wheel, fitted to B.S.A. Auto model bicycle, in splendid condition, ridden only 900 miles; owner enlisted; £16/10.—Hucklebridge, 133, Sloane St., London, S.W. [X8651]

**A**UTO-WHEEL Model de Luxe, B.S.A., 14h.p., good condition, practically new, £7, also Raleigh roadster, 3-speed, 24 frame, heavy roadster tyres, specially built for Auto-Wheel, good as new, £6; sell complete, or separate; cash; reason for selling, have motor combination.—Box 369, c/o The Motor Cycle. [X8590]

## Arno.

**A**RNO Motor Cycles from £38 to £50; early delivery; deferred terms from one-quarter down, balance by twelve monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Arno motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4055]

## Bat.

**3**h.p. Bat, Bosch, new belt, good order; £8.—Barrett, Chapel Mews, Hove. [4554]

**B**AT-J.A.P. 1912 2-speed 7h.p. Combination, splendid condition, just overhauled; £26.—P. Nicholls, Crewkerne. [X8525]

**B**AT-J.A.P. 1913 Combination, 6h.p. Bosch, 2 speeds, countershaft, kick, perfect; £36/10.—I. Ebner St., Wadsworth. [X8420]

**6**-8h.p. 1914 Bat, 3-speed gear, clutch, excellent condition, powerful, reliable machine; £38.—Seen Ross-leigh's Garage, Edinburgh. [X8626]

**B**AT-J.A.P. 1911, 4h.p., F.E.P. and H. lamps, new tyres, all accessories, recently overhauled; £19.—3, Aldwych Terrace, Ulverston. [X8665]

**B**AT-J.A.P. 1915 Combination, 3-speed, ridden only 3,000 miles, in excellent condition; £70.—Hucklebridge, 133, Sloane St., London, S.W. [X8446]

**B**AT-J.A.P. 1915 5-h.p. Combination, luxuriously sprung, 3-speed countershaft, Lucas fittings, Amco carburettor, fast machine, owner driven; cheap for cash sale.—Whitehouse, Engineer, Great Bridge. [X8294]

**B**AT-J.A.P. 1913 8h.p. Combination, B. and B. carburettor, Bosch shaft driven mag., countershaft gears, sidecar, Swan de Luxe, hood and screen, all accessories, in tip-top condition, take 3 anywhere; £55.—E. Macmillan, King's Langley. [X8623]

**B**AT-J.A.P. 1914, 6h.p. J.A.P. engine, countershaft sidecar, new 650x65 Dunlop combination back tyre, Jones trip speedometer, lamps, electric horn and sidecar lamp; £62.—The Premier Motor Co., Aston Rd., Birmingham. [4822]

**19**15 8h.p. Spring Frame Bat, and Bat spring wheel sidecar, purchased Easter, only driven 2,000 miles, exceptionally well looked after, would almost pass muster for new, 2 pairs handle-bars, one of the smartest outfits running; great bargain, £70; guaranteed faultless.—Hucklebridge, 133, Sloane St., London. [X8643]

## Bown.

**B**OWN-VILLIERS, 1916 (brand new), 2½h.p., mag., 2 speeds, countershaft; cost £38/10, on price £29 gns; easy terms.—Wadsworth Motor Exchange, Ebner St., Wadsworth Town Station. [X8421]

## Bradbury.

**19**12 Bradbury, excellent order; £25.—Parker and Son, St. Ives, Hunts. [4745]

**19**08 Bradbury, with 1916 Binks, racing splendidly; £12.—L1277, c/o The Motor Cycle. (D) [4592]

**B**RADBURY, 1913, 3½h.p., 2 speeds, free engine, all accessories; owner with Expeditionary Force; £24, no offers.—Dunstan, Royal Engineers, Wheelers' Shop, Haynes Park, Bedford. [X8726]

## Brown.

**B**BROWN 3½h.p. and Sidecar, 2-speed N.S.U. gear, very good order; £25; easy payments if desired.—Jones, Garages, Broadway, Muswell Hill. [4361]

**B**BROWN, 3½h.p., fitted in Rex frame and sidecar, in splendid order, new Dunlop tyres, Drip feed, handle start, very low; £17.—Abbott, Witton Gilbert, Durham. [X8621]

**3**½h.p. Brown, mag. ignition, good tyres, spring forks, complete; must sell; £11/10, or offer; seen after 7 or Sundays.—252, St. Ann's Rd., South Tottenham, N. [X8438]

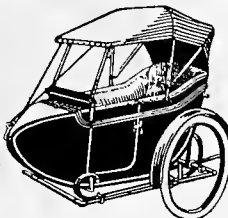
## B.S.A.

**B**.S.A., new 1916 models K and H in stock; go waiting.—Moss, Wem. [X8749]

**B**.S.A. Models H and K in stock; immediate delivery.—Colmore Depot, 261, Deansgate, Manchester. [4664]

## CORONET Sidecar Chassis

Is designed for long life, and has a wonderful reserve of stability, and is safe on greasy roads. Luggage carrier built into frame. Cannot shake loose, and is a boon when touring.



£10 15s.

Send for Illustrated Catalogue describing these well-known Sidecars.

EXCHANGES.

TRADE SUPPLIED.

We can give immediate delivery of all models and suitable for any make of machine.

## SIDECARS FOR HARLEY-DAVIDSONS, EXCELSIORS, and INDIANS.

We make a special Sidecar, enamelled French grey to match, 28 x 3in. tyre, apron to cover entire body, and four-point attachment. .... £13 10 Immediate Delivery.

## 7-9 h.p. HARLEY-DAVIDSON.

11, electrically equipped, 3 speeds .... £76 13  
11F, standard 3-speed model .... £68 5  
Cash Offers Wanted.

## CASH OFFERS WANTED.

4½ h.p. STAR, big single, brand new 3-sp., chain drive, kick starter; listed £68 ss. .... £55 0  
1916 7-9 h.p. HARLEY-DAVIDSON .... £80 15  
1916 ditto, electrical model .... £89 0  
6 h.p. A.J.S., 1915, lamps, horn, speedometer, Sidecar with screen .... £78 0  
7 h.p. INDIAN, 1916, Powerplus, only run 800 miles .... £69 15  
2½ h.p. WOLF, 1916, 2-stroke, 2-speed .... £33 10  
6 h.p. REX de Luxe, 1913 2-speed model, with ½ h.p. Sidecar .... £35 15  
6 h.p. ZENITH, 1911, Zenith gear .... £25 15  
3½ h.p. TRIUMPH 1910 model .... £18 15  
3½ h.p. LINCOLN-ELK, 1912 model .... £15 15  
5 h.p. INDIAN, 1915, 3-speed, finished red, beautiful condition .... £57 15  
4 h.p. ZENITH, 1912, variable gear .... £25 0  
3½ h.p. PREMIER, 1912, 2-speed .... £22 15  
3½ h.p. RUDGE, 1912, free-engine model .... £19 15  
3½ h.p. P. & M., 1909, 2-speed, chain drive, with Sidecar .... £19 15  
3½ h.p. SINGER, 1912, 3-speed model, with cane Sidecar .... £25 0  
3 h.p. HUMBER Tricar .... £4 15  
3 h.p. LINCOLN-ELK, 1911, magneto .... £12 15  
3½ h.p. TRIUMPH, 1911, 2-speed model, with Sidecar, lamps, and horn .... £23 15  
2½ h.p. PREMIER, 1912, 3-speed model .... £20 15  
1915 MORGAN, 700 x 80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. .... £89 0  
3½ h.p. HUMBER, 1911, 2-speed .... £17 15  
3½ h.p. P. & M., 1912, kick starter .... £27 15  
3½ h.p. PREMIER, 1911, B.S.A., 2-speed .... £18 15  
1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn, and lamps .... £89 15

## MISCELLANEOUS.

New Complete Sidecar Chassis .... £ 2 19 6  
New Coach-built Body, side door .... 2 17 6  
New £5 Weatherproof Magneto, single .... 3 10 0  
Good Sidecar, complete .... 1 12 6  
1916 Binks Carburettor, Your old carburettor taken in exchange.  
Light Car Chassis, with 6½ h.p. De Dion engine, 2 speeds, good tyres .... £12 15 0  
Speedwell Sidecar Chassis, with 2½in. tyre 2 19 6  
New 2½ h.p. Petrol Stationary Engine, mag., 2 flywheels; listed £22 ros. .... £15 15 0  
£13 Burbury Coach Sidecar .... 6 15 0  
Cane Sidecar, enclosed body .... 3 15 0  
New Projectile Cane Sidecar .... 8 5 0  
Wanted, B. & B. Lightweight Carburettor. Wanted to buy Lath, about 6½in. centres.

## BOOTH'S MOTORIES, PORTLAND PLACE, SKIRCOAT ROAD, HALIFAX.

Phone: 1062.

Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## B.S.A.

**B**.S.A.—All models and sidecars in stock; cash or easy payments.—Colmore, 44, Finsbury Pavement City. [4827]

**19**16 Model H B.S.A. in stock.—Jones, Garage, Broadway, Muswell Hill. Easy payments if desired. [4834]

**B**.S.A., 1914, 4½h.p., 3 speeds, countershaft, coach-built sidecar; £45.—Percy and Co., 337, Euston Rd., London. [4802]

**B**.S.A., new models. I have a good stock of model H and No. 2 sidecars; no waiting.—Hucklebridge, 133, Sloane St., London, S.W. [X8447]

**B**.S.A., 1915, 4h.p., chain-cum-belt, 3-speed, complete; accept £45, worth quite £50, cash only.—Layton's Garage, Bicester, Oxon. [X8724]

**B**.S.A., model K, and No. 2 sidecar, wind screen, Lucas lamps, Long horn, May, 1915, little used; £61.—91, Kingsfield Rd., Watford. [4699]

**B**.S.A., 4½h.p., 1916 K models, chain-cum-belt, 3-speed, kick starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton, London. [X8688]

**B**.S.A., four models of H and K actually in stock; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4460]

**19**15 B.S.A., 4½h.p., 3-speed chain drive, Millford coach sidecar, sound, reliable, and economical combination; £58.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [10552]

**B**.S.A., new £64 model, with new P. and H. lamps and horn (all unpacked), also almost new Projectile sidecar, their best model, costing £30; what offers?—Veitch, 114, Askew Rd., Shepherd's Bush. [4819]

**B**.S.A., 1916, model K, 4h.p., chain-cum-belt, countershaft 3-speed, used once, guaranteed unsoiled and perfect; cost £62, must sell because of serious illness, accept £55; will transfer warranty.—Tollady, Hemingford, Bicester, Oxon. [X8723]

**B**.S.A., August, 1913, 2-speed, Gloria cane sidecar, very fast, extremely reliable, everything lovely condition, Lucas 3 in. head light, 25/- horn, watch, new Dunlop back, Whittle belt; £42, close offer considered; only wants seeing.—Leach, 25, Coppenhall Terrace, Crewe. [4522]

**B**.S.A., 1916.—We can deliver the famous model K from stock, the finest 4h.p., 3-speed countershaft machine on the market; price £62; exceptional exchange quotations, extended payment propositions of any reasonable character entertained. We are B.S.A. specialists, and our mechanics test and tune every machine before delivery.—Layton's Garage, Bicester, Oxon. Phone: 35. [X8722]

## Calthorpe.

**C**ALTHORPE-J.A.P., 2½h.p., with Enfield 2-speed gear, brand new; £35.—Moss, Wem. [X8753]

**C**ALTHORPE Junior, 1914, excellent order; bargain; £14.—Jackson, Troonmoor, Trowbridge. [4586]

**C**ALTHORPE Junior, 1914, 2 speeds, excellent condition; £16/10.—Darke, Draper, Sutton, Surrey. [4624]

**C**ALTHORPE-J.A.P., 1915, 2 speeds, lamps, Klaxon, etc.; £26/10.—11, Luna Rd., Thornton Heath Clock, S.E. [4602]

**C**ALTHORPE-PRECISION, 1914, 2½h.p., 2-speed, excellent condition; £16/10.—Bristow, 23, Bickersteth Rd., Tooting. [4777]

**C**ALTHORPE-J.A.P., 2-speed, 1916 machine, not done 150 miles; £26.—Colmore Depot, City Agency 44, Finsbury Pavement. [4826]

**C**ALTHORPE-PRECISION, 2-speed, new condition; bargain, owner going to France, £18.—L.C., 45, Fairlaw Av., Chiswick Park, W. [4663]

**C**ALTHORPE-J.A.P.'S, single speed and 2-speed models in stock.—Jones, Garage, Broadway, Muswell Hill. Easy payments if desired. [4835]

**C**ALTHORPE-J.A.P., July, 1915, done 1,000 miles, splendid condition; £28; eye trouble cause of sale.—Daniell, 73, Parsons Green Lane, Fulham. [4617]

**C**ALTHORPE, 1916, latest model, 2-stroke, Enfield 2-speed gear, just arrived from works; £32/11.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4577]

**C**ALTHORPE-J.A.P., 1916, latest model, 2½h.p., Enfield 2-speed gear, just arrived from works; £37/16.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4576]

**C**ALTHORPE Motor Cycles, 1916 models.—Just arrived: 2-stroke 2-speed 31 gns., J.A.P. 2½h.p. 2-speed 36 gns.; easy terms arranged.—Stores, 118, Gt. Portland St., W. [10777]

**C**ALTHORPE.—These splendid little models in stock; £37/16; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4451]

**C**ALTHORPE, latest 1916, 2-speed models in stock; cash or exchange, no waiting; also a few brand new 1915 models, slightly soiled, at reduced prices.—Eagles and Co., High St., Acton, London. [X8686]

**C**ALTHORPE, brand new, 2½h.p., 2-stroke, h.b. controlled mag., aluminium footboards, Moseley tyres. Druid forks; £28/16, or deposit £8 and 12 payments of 39/5.—Seen at Juno Showrooms, 248, Bishopsgate, London. [4806]



## MOTOR CYCLES FOR SALE.

## Campion.

- CAMPION**, 3½ h.p., 1911 model, Bosch. Drmids, very smart; £14.—224, Belgrave Gate, Leicester. [X8709]
- CAMPION-N.S.U.** Twin Lightweight, perfect order; cheap.—Ames, Market Place, Long Eaton. [X8448]
- 1915½** Campion, like new, Villiers 2-stroke, Spray, Dunlops, horn, tools; £20/10.—Electrician, Studley Royal, Ripon. [X8601]
- CAMPION-VILLIERS**, 1915, excellent condition throughout, overhauled, complete; £22.—Layton's Garage, Bicester, Oxon. [X8720]

## Centaur.

- TO** Amateurs willing to modernise old machine.—3½ h.p. Centaur, chain drive, £5.—Goldsmith, Cobham, Surrey. [X4561]

## Chater-Antoine.

- CHATER-ANTOINE**, 3½ h.p., Bosch. B. and B., spring forks, low, perfect; £9.—47, Leigh Rd., East Ham, Essex. [X4723]

## Chater-Jap.

- 1914** 8 h.p. Chater-Jap, 3-speed, 650x65 tyres, lamps, horn, speedometer, coachbuilt sidecar, hood and screen, in perfect order; £50; easy payments if desired.—Jones, Garage, Broadway, Muswell Hill. [X4357]

## Chater-Lea.

- CHATER-LEA** 1911 6 h.p. Twin Combination, 2-speed, P. and M. gear, coachbuilt sidecar; £27.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [X4118]

## Clyno.

- 1912** Clyno, sidecar, 2-speed, kick starter; owner enlisted; £25, or offers.—McNaughtan, 10, Johnston St., Paisley. [X8579]

- CLYNO** 1914 Combination, 6 h.p., 3 speeds, counter-shaft, a real good machine; £45.—Percy and Co., 357, Euston Rd., London. [X4795]

- CLYNO** (1914), 6 h.p., 3-speed, new pistons, 3 new tyres, spare wheel, splendid condition; £57.—Lt. Palmer, 47, Chestnut Av., Leeds. [X8444]

- CLYNO**, 1915, 6 h.p., 3-speed, clutch, kick starter, condition as new; bargain; £50; any trial.—Lieut. Norman, 621 Coy. A.S.C., Catterick. [X4560]

- CLYNO** Combination, 1912, Lucas head lamps, rear lamp, horn, and mirror, 5 gn. speedometer, perfect order; offers.—8, Lowlands Rd., Harrow-on-the-Hill. [X8492]

## Connaught.

- 1916** Connaught Miniature, single and 2-speed, in stock.—Williams, Chapel Ash Depot, Wolverhampton. [X8679]

- CONNAUGHT**, 2-stroke, 2½-3 h.p., nearly new, 1915½, £19; must be sold at once.—1, Campbell Rd., Croydon. [X7994]

## Dayton.

- DAYTON**, 1913, 2 h.p., first-class condition; £11/15.—Rose's Garage, Uxbridge. [X4740]

## Douglas.

- DOUGLAS**, 1911, good order; £18/10.—12, Myddleton Rd., Bowes Park. [X4764]

- 2½** h.p. Model U Douglas in stock, 3 speeds; 50 gns.—4 Cross, Agent, Rotherham. [X8647]

- DOUGLAS**, 1914, T.T. Lucas lamp, horn; £34.—50, West, End Lane, Hampstead. [X8573]

- 1914** T.T. Douglas, 2-speed, perfect condition; £25, bargain.—H. Wright, Arlesey, Beds. [X8740]

- DOUGLAS**, 1911, just overhauled, excellent condition; £16/10.—Jackson, Ironmonger, Trowbridge. [X4587]

- 1911** Douglas, splendid condition, tyres nearly new; £17.—Thorn, 43, Mortimer Rd., Kensal Rise. [X8745]

- DOUGLAS**, 1911, 2½ h.p., splendid condition, road tyres; £12/10.—101, Tooting Bee Rd., Tooting, S.W. [X4622]

- DOUGLAS**, 1913, clutch, 2 speeds, speedometer, lamps, etc.; £22.—11, Luna Rd., Thornton Heath, Clock, S.E. [X4601]

- 1914½** Douglas, 2½ h.p., kick start, clutch model, 2-speed; £38.—Fazakerley, 5, Ashton Rd., Droylsden. [X4022]

- DOUGLAS**, 1913, 2½ h.p., 2-speed, perfect condition; £21; seen by appointment.—Victor, 80, Huntley St., W.C. [X4530]

- 4** h.p. Douglas, 1915, 3-speed gear, clutch, and kick starter, perfect order; £45.—Lewin, Wadcroft, Kettering. [X8425]

- DOUGLAS**, 1912½, good condition, new Dunlop tyres; £23.—Coxons, 26, St. Jude's Rd., Wolverhampton. [X8427]

- 1915** Douglas, new May, 2 speeds, Lucas lamps, picked machine; £41.—10, Norwood Crescent, Southampton. [X8431]

- DOUGLAS**, 1915, 2½ h.p., 2-speed, lamp, horn, speedometer, and spares; £36.—2nd. Lt. Smith, R.A.-Moss, Woolwich. [X8624]

- 1913** Douglas, 2½ h.p., 2-speed, T.T., perfect condition, speedometer, etc.; £30.—Smith, 43, Montpelier Rd., Kenilworth Town. [X4760]

- 1913** T.T. Douglas, 2½ h.p., 2-speed, good lamp sets, new tyres, last machine; £31, or nearest offer.—Arthur, Ashted, Surrey. [X8680]

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SUN-VILLIERS, 2½ h.p., 2-speed	£37 0
SUN-V.T.S., 2½ h.p., single-speed	£30 16
SUN-V.T.S., 2½ h.p., 2-speed	£38 0
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B.S.A., 4½ h.p., ditto, chain-cum-belt	£62 0
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INDIAN, 5 h.p., 3 speeds, Model B	£70 0
INDIAN, 7 h.p., 3 speeds, Model C	£78 0
ENFIELD, 3 h.p., 2-speed, T.T.	£52 10
ENFIELD, 6 h.p., Combination	£89 5
LEVIS, 2 h.p., Popular model	£32 0
B.S.A., 4½ h.p., and No. 2 Sidecar	£80 18
ENFIELD, 6 h.p., electrical model	£105 0
ROYAL RUBY, 2½ h.p., lady's, 2-speed	£38 0
ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke	£36 10
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TRIUMPH, 1912, 3½ h.p., 2-speed	£30
REX, 1914, 6 h.p., 3 speeds, accessories	£52
REX, 1914, 6 h.p., 2 speeds, coach-built	£42
REX, 1913, 6 h.p., 2 speeds, cane Sidecar	£32
SUNBEAM, 1914, 6 h.p., 3 speeds, Sidecar	£82
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EXCELSIOR, 1915, 8 h.p., Combination	£78

## SOLO MOUNTS.

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ALLDAYS-MATCHLESS, 2½ h.p., 2-speed	£25
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ZENITH, 1913, 3½ h.p., Gradua gear	£38
ROYAL RUBY, 1915, 2½ h.p., J.A.P., 2-speed	£35
RUDGE, 1914, 3½ h.p., Multi, as new	£38
ENFIELD, 1915, 3½ h.p., 2-speed twin	£43
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DOUGLAS, 1914, 2½ h.p., 2-speed, kick start	£41
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SINGER, 1915, 10 h.p., dynamo	£230
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- £10**—Douglas, 1910, good condition, wants timing; sacrifice.—82, Humbolt Rd., Hammersmith. [X4619]
- DOUGLAS**, 1911, 2-speed, clutch, in good order (one exception); what offers? going cheap.—Letters, M., 17, Rosemont Rd., Acton. [X4599]
- DOUGLAS**, 1914½, 2½ h.p., T.T., 2-speed, re-enamelled and overhauled new tyres and lamps; £37.—109, St. Michael's Rd., Aldershot. [X4630]
- 1915** 2½ h.p. 3-speed Douglas, with special light weight Godiva sidecar; best offer over £50.—Stewart, Ardough, Londonderry. [X7460]
- DOUGLAS**, T.T., 1913, 2½ h.p., 2-speed, good condition, lamps, horn, all complete; £30.—Fair, Creamery Farm, Farley, Otley. [X8591]
- DOUGLAS**, 1915, 4 h.p., 3 speeds, kick starter, and Douglas coachbuilt sidecar, a nice lot; £65.—Percy and Co., 337, Euston Rd., London. [X4799]
- IMMEDIATE** Delivery new Douglas, 3-speed, 1915 3-speed, 1914 2-speed, both as new; written guarantees willingly.—Gibb Gough, Gloucester. [X189]
- DOUGLAS**, W model, £56/14, not done 30 miles, clutch, kicks, too high for owner, tools, horn; £50, net.—Thomas, Head Teacher, Pontyemmer, Glamorgan. [X4770]
- 1915** Douglas, 2½ h.p., 2-speed T.T. model, lamps and horn, machine had very little use, equal to new; £42.—The Premier Motor Co., Aston Rd., Birmingham. [X4823]
- DOUGLAS**, September, 1914, 3½ h.p., 2-speed, kick starter, Lucas lamps and horn, only ridden 500 miles, condition like new; £45.—Hilder, 15, Reginald, Bexhill. [X4607]
- DOUGLAS**, 1913, 2½ h.p., 2-speed, clutch, kick starter; £29.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [X4116]
- DOUGLAS** for Sale, T.T., Oct., 1914, 2½ h.p., 2-speed, no clutch, lamps, horn, speedometer, perfect condition, run 1,000 miles; £42.—Rauken, 11, Spence St., Edinburgh. [X4842]
- DOUGLAS**, late 1913, new lamp, mudguard, chain, spring brackets, good tyres, powerful, fast, very economical; £30.—Lieut. Clarke, 22, Palace Rd., Streatham Hill. [X4527]
- 1913** 2½ h.p. Douglas, clutch, kick-start, footboards, upturned handle-bars, just overhauled, excellent condition; £30.—Robinson's Garage, Green St., Cambridge. [X4683]
- WAR** Office Douglas, latest pattern, specification as list, 2 Lucas lamp sets, horn, all spares, ridden 250 miles only; £52.—Robinson's Garage, Green St., Cambridge. [X4682]
- DOUGLAS** 4 h.p. Combination, late 1915, mileage 500, top-hole condition throughout, unscratched; cost £85, fully equipped, bargain, 60 gns.; any trial.—Box L1,226, c/o The Motor Cycle. [X4317]
- 1915** Douglas, 2½ h.p., War Office model, all black finish, purchased new last Dec. lamp, horn, speedometer, spare belt; £48.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [X4042]
- DOUGLASES**—Order the new 1916 models now, which are due in just after Easter; orders issued in strict rotation.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X4452]
- 2½** h.p. Douglas, 2-speed, clutch model, engine just overhauled, T.T. bars, new back tyre, lamps, horn, pump, spares, new belt and 2 tubes; first cheque 224 secures; owner under offers for France.—Artichoke Cpl. Potter, Buryvale, Hershaw, Surrey. [X8654]
- DOUGLAS** Agents and Specialists. We refrain from mentioning 1916 models, as at present there is no likelihood of obtaining deliveries. We can supply and deliver the latest models brand new at rock bottom prices. Tel.: 388. T.A.: Bicycles.—Robinson's Garage, Green St., Cambridge. [X4678]
- DOUGLAS**, 1915, 2½ h.p., 2-speed, War Office model, mileage only 600, Stewart speedometer, P. and H. head light, tail lamp, knee-grips, horn, tools, 2 leather cases, spare tube and case, plate numbers, perfect condition, driven by officer now in France; cost £60 and last December, accept £45 cash, genuine bargain.—To view apply, C. H. Watson, 366, Streatham High Rd., S.W. T.N.: Streatham 232. [X4591]
- Enfield.**
- L**ATE 1914 Enfield Combination, practically new; £55.—37, Arlington Rd., Surbiton. [X4706]
- 1916** Brand New 2½ h.p. 2-stroke Royal Enfield; what offers?—Hurst, Church St., Poulton-le-Fylde. [X4564]
- 1915** 3 h.p. Enfield, all accessories, done 2,500 miles; £37/10, cost £56 May.—Burns, Newbury. [X8313]
- ROYAL** Enfield Twin Lightweight, 2-speed; any trial; splendid condition; £28, or offer.—497, Old Ford Rd., Bow. [X4614]
- ENFIELD**, March, 1916, 3 h.p., £52/10 model, once used, substantial reduction.—Box 334, c/o The Motor Cycle. [X7982]
- ENFIELD** 3 h.p. Twin, 1914, Watford, horn, lamps, all tools, condition perfect; £35.—Powell, Artillery St., Montgomery. [X8662]
- NEW** Royal Enfield, 6 h.p., 2-speed and free engine, Enfield combination sidecar, cannot take delivery; £85 for quick sale; never been on the road.—Hear, 137, Whalley Rd., Accrington. [X7886]

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DOUGLAS, War Office Model £54 12

DOUGLAS, Model V, 2-speed £50 8

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ENFIELD combination £29 5

SPARKBROOK, 2-stroke £40 0

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1914 A.J.S., 5-6 h.p., 3-speed combination £70

1915 DOUGLAS, T.T., 2½ h.p., 2-speed £45

1914 3-speed 2½ h.p. NEW HUDSON and  
coach sidecar £48

1915 2-stroke 2-speed VELOCETTE £28

1913 2½ h.p. Ladies' DOUGLAS £38

1914 INDIAN Combination, 7-9 h.p., 2-sp. £55

1914 DOUGLAS, T.T., 2½ h.p., 2-speed £38

1914 RUDGE, 5-6 h.p., shop-soiled £35

1913 RUDGE, 3½ h.p., Phillips pulley £25

1912 MOTOCOCHE, 2½ h.p. £15

1915 JAMES, 4½ h.p., James Canoelet Sc. £65

1915 3-speed HARLEY and Swan Sidecar £60

1914 2-speed IXION £22

1914 CONNAUGHT, 3-speed £30

1914 3-speed CLYNO, and coach Sidecar £60

1915 7 h.p. MATCHLESS and coach side-  
car £78

1913 3½ h.p. ALLDAYS, 2-speed £22

1911 2-speed HUMBER £15

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1914 SINGER, dynamo lighting £175

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STANDARD £175

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1913 FORD, 4-seater £70

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ENFIELD, 1916, 3h.p., just arrived from works;  
£52/10.—Wilkins, Simpson, and Co., 11, Hammer-  
smith Rd., London. [4581]

ENFIELD Combination, 1912, 6h.p., 2-speed, coach-  
built, all accessories; £48; perfect.—Leighton's,  
opposite Wood Green Station. [4829]

ENFIELD 3h.p., Twin, new May, 1915, in splendid  
condition, with tyres little worn, 2 Lucas lamps,  
and speedometer; £45.—Cliff and Sons, Eltham. [4707]

ENFIELD 2-stroke, 1914, 2-speed, Palmer tyres, in  
splendid order, guaranteed; £36; easy payments if  
desired.—Jones, Garage, Broadway, Muswell Hill. [4356]

ENFIELD, 1916, 2-stroke, 2½h.p., 2-speed, and free  
engine, just arrived from works; £42.—Wilkins,  
Simpson, and Co., 11, Hammersmith Rd., London. [4580]

2½h.p. Royal Enfield, twin, as new, fitted everything  
very best, absolutely perfect; 18 gns.; called up;  
bankers' references.—Hurst, Church St., Poulton-le-Fylde.  
[4565]

ENFIELD 6h.p. and 8h.p. models actually in stock;  
deferred payments by arrangement.—Lamb's,  
151, High St., Walthamstow, and 50, High Rd., Wood  
Green. [4458]

6h.p. Enfield Combination, done 2,600, guaranteed  
perfect and unscratched, lamp set, horn, speedo-  
meter; genuine bargain, £50.—Empson, Gamlingay  
Sandy. [4655]

ROYAL Enfield, 1912-13, 6h.p. combination, just  
overhauled, new tyre, 2 lamps, and generators, me-  
chanical horn; £39.—57, East Terrace, Fairlaw Park  
Sydenham, S.E. [4728]

1914 6h.p. Enfield Combination, bought from makers  
November, 1914, speedometer, lamps, horn, new  
tyres, luggage grid, tools, spares, perfect condition; trial;  
£63.—Samp, 72, Park Rd., Farnborough, Hants. [X8641]

ENFIELD, 6h.p., 1916 electric model, with hood  
and screen; £105; only shop-soiled; deferred  
payments by arrangement.—Lamb's, 151, High St.,  
Walthamstow, and 50, High Rd., Wood Green. [4459]

ENFIELD 1916 Combinations.—We have them in  
stock; cash price £39/5. Exceptional exchange  
quotations; extended payment propositions of any  
reasonable character entertained.—Layton's Garage,  
Bicester, Oxon. [X8718]

Excelsior.

EXCELSIOR (American), 1915½, 7-9h.p., 3-speed,  
clutch, kick start, electrically equipped; absolute  
bargain, £48.—Nesma, 7, Exhibition Rd., South Ken-  
sington. [X8498]

7-9h.p. Excelsior, 1914, 2 speeds, with underslung  
coach sidecar, splendid order and condition, done  
1,500 only; £45, or exchange lightweight and cash.—  
91, Baltic Rd., Sheffield. [X8594]

F.N.

F.N. Motor Cycle, 2½h.p., 2-speed, new; £40.—Shand,  
Banchory. [4548]

4½h.p. 4-cyl. F.N., 1912, clutch model, perfect; £22/10.  
—T. Winter, 24, Mount Pleasant, Louth. [X8675]

F.N., 1912, 4-cyl., 2-speed gear and clutch, splendid  
condition; £26.—5, Heath St., Hampstead. [4731]

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C.B. sidecar, topping condition; £27/10.—  
Garaged H.D.C. Motors, Hendon. [4704]

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higher power.—163, Railway Approach, Shepherd's Bush.  
[4618]

1913-14 F.N., 4-cyl., 5-6h.p., 2 speeds and clutch,  
back seat, beautiful machine, with accessories,  
lamp and horn; £30, a bargain; owner leaving for France.  
—F.N. Motor Works, Kimberley Rd., Willesden Lane.  
[4566]

Harley-Davidson.

BRAND New Harley-Davidsons.—See below.

MODEL F. 7-9h.p., 3-speed; £68.—The Premier  
Motor Co.

MODEL J. 7-9h.p., 3-speed, with dynamo electric  
lighting outfit; £75.—The Premier Motor Co.

THE Above are guaranteed brand new; standard specifi-  
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SPECIAL Gloria Sidecars, to match; 19 and 25 gns.  
You save £17 by purchasing your new combina-  
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livery carriage paid to any address.—The Premier  
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1916 Harley-Davidsons, all models in stock.—Below.

7-9h.p. Harley-Davidson, model 11F, purchased Oct.,  
1915, perfect condition; £55.—Parker and Son,  
St. Ives, Hunts. [4744]

HARLEY-DAVIDSONS, 1916 models; immediate de-  
livery from stock.—Colmore Depot, 261, Deansgate,  
Manchester. [4667]

HARLEY-DAVIDSON Models in stock, complete  
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Rd., Brighton. [0713]

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mediate delivery, also several new 1915 1½ models  
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and 31, Renshaw St., Liverpool. [4539]

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1916 8 h.p. ENFIELD Combination ..... 87 gns.

1916 6 h.p. J.H. Combination ..... 90 gns.

1916 6 h.p. NEW HUDSON ..... 72 gns.

1916 6 h.p. NEW HUDSON Combination ..... 80 gns.

1916 2½ h.p. NEW HUDSON, 2-sp., 2-stroke £38 0

1916 2½ h.p. OMEGA-J.A.P., 2-speed ..... 38 gns.

1916 2½ h.p. OMEGA, 2-stroke, 2 speed ..... 38 gns.

1916 8 h.p. British EXCELSIOR Combina-  
tion, Jardine 4-speed gear ..... £98 0

1916 5-6 h.p. British EXCELSIOR, Sturmer  
countershaft 3-speed gear ..... 68 gns.

1916 4½ h.p. British EXCELSIOR, Sturmer  
countershaft 3-speed gear ..... 64 gns.

1916 FORD Touring Car, 20 h.p. £135 0

1916 FORD Chassis, 20 h.p. £115 0

1916 FORD Van, 20 h.p. £130 0

1916 20 h.p. FORD Ambulance ..... £135 0

1915 12 h.p. TRUMBULL Cycle Car, 4-cyl.,  
water-cooled, detachable wheels, all on £120 0

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1914 6 h.p. ENFIELD Combination, speedo-  
meter, lamps, etc., very smart ..... £62 0

3½ h.p. NEW HUDSON, 3-speed, combined  
drive, lamp, horn, etc. .... £33 0

3½ h.p. ROVER, 1913, 3-speed ..... £29 0

1914 8 h.p. Red ZENITH Comb., very fast £59 0

1915 WOLF, lightweight, 3-speed ..... £25 0

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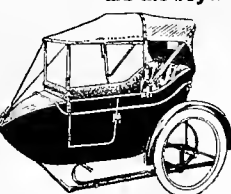
3½ h.p. 1908 TRIUMPH, fine goer ..... £17 0

3½ h.p. 1909 REX de Luxe, 2-speed, handle  
starting ..... £19 0

1913 FORD, English body, Bosch magneto,  
disc wheels ..... £94 0


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1915 Harley-Davidson Combination. 1,000 miles, speedometer; £70.—William, 8, Holmwood Gardens, Brixton Hill. [X8650]

1915 Harley-Davidson 7b.p. Combination, dynamo lighting, perfect; 70 gns., bargain.—Blake, 218, Westbourne Grove. [X4658]

1916 Harley-Davidson, 11F, kick starter, Empress sidcar; optional exchange considered.—Beane, Matlock Bath, Derbyshire. [X8630]

HARLEY-DAVIDSON, 11F, 1915, solo, Lucas accessories, tools, mileage small, fine condition; £58.—Frith, 326, Essex Rd., N. [X4642]

HARLEY and Sidcar, electric, 1915-16, as new, done only 1,000 miles; cost over £100, take £75.—Leighton's, opposite Wood Green Station. [X4851]

1915 Harley-Davidson, 7-9h.p., 3-speed, model 11F, and new Montgomery coach sidcar; £68.—Elee and Co., 15-16, Bishopsgate Av., Cannonville St., E.C. [X0551]

HARLEY-DAVIDSON, Oct., 1915, model 11C, 4h.p., with coachbuilt sidcar. Dunlop heavy tyre, absolutely new; price £58.—Salter, 580, Old Kent Rd., London, S.E. [X4784]

HARLEY-DAVIDSON, 7-9h.p., 1915, with Canoelet sidcar, tandem model, hood and screen, guaranteed brand new, with lamp, horn, and speedometer; best offer.—Guest, Mill Mead, Skewsbury. [X7796]

HARLEY-DAVIDSON, in stock, with or without sidecars; have one for 1916. 1915 riders say they're "simply it." Deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X4450]

1915 Harley-Davidson, 7-9h.p., 3-speed, clutch model, fitted with Mills-Fulford sidcar, and dust cover, speedometer, lamps, mechanical horn, tools, and spares; £60, or nearest offer.—Sgt. Selby, 6th Co., R.E., Binckley Barracks, Weymouth. [X4524]

HARLEY-DAVIDSON 1915 4-6h.p. Motor Cycle, P. and M. lamp and horn, speedometer condition, with 20 gns. coachbuilt sidcar (practically new), and fitted with hood, screen, and apron, for sale; war bargain; owner grouped.—18, Wharf St., Stockton-on-Tees. [X4355]

1915 Harley-Davidson, delivered November, 1915, 7-9h.p., 3-speed clutch model, new Palmer cord car size tyre on rear wheel, fitted with very smart almost new Mills-Fulford sidcar, upholstered in green, wind screen, dust cover, etc., unused Dunlop heavy tyre fitted; price £68.—Vincent Motor Co., Rugeley Camp, nr. Stafford. [X4266]

## Hazlewood.

HAZLEWOOD, 1913, 2½h.p., 3 speeds, Stewart speedometer, lamps, etc.; best offer near £19.—31, Beechwood Av., Thornton Heath. [X0795]

## Henderson.

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## Hobart.

1911 Hobart Lightweight, open frame, 3 speeds, T.T. bars, etc.; ideal beginner's machine; cheap, £13/10.—136, Dalnally Rd., E. Croydon. [X7787]

HOBART-VILLIERS, 1915, very fine condition throughout, overhauled, complete; £22/10, very great bargain.—Layton's Garage, Bicester, Oxon. [X8719]

## Humber.

HUMBER, 2h.p., like new; £17, or cycle part.—46, Mary Rd., West Bromwich. [X8746]

HUMBER Lightweight, 2h.p., up to date, perfect; £12/10.—Hennan, 18, Foster Hill Rd., Bedford. [X8684]

HUMBER, Oct., 1913, 2 speeds, handle starting, coach sidcar; £34.—30, Church Rd., Southgate Rd., London. [X4724]

HUMBER Twin, Tourist Trophy model, in first-class order; splendid value, £20.—Crypto, 14, Mortimer St., W. [X8265]

2½h.p. Twin Humber, 1914, splendid condition, lamps, horn, good tyres.—Marchant, Baker St., Weybridge. [X8620]

HUMBER, 3½h.p., sound machine; seen running; bargain, £5/15.—Speckley, 45, Church Rd., Acton. [X8736]

HUMBER, 3½h.p., 1913, 2-speed, handle starter, with Gloria underfolding sidcar; £30.—29, St. Leonard's St., Bow. [X4751]

HUMBER Motor Bike and sidcar frame, in good running order, just overhauled; £30.—Box 368, c/o The Motor Cycle. [X8622]

LATE Humber, 2-speed, free engine, Binks carburettor, tyres excellent; bargain, £23.—Pooley, 1, Wandle Rd., Forest Hill. [X4585]



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Model 140, 3½ h.p., twin, 2-speed.

6 h.p. coach-built combination.

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NORTON, 3½ h.p., Brooklands Road Special.

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ZENITH, 1918, 3½ h.p., clutch model, with Gradua gear, head lamp, back lamp, and horn

ZENITH, 1915, 3½ h.p., countershaft gear and clutch, head lamp, back lamp, horn, speedometer, Empress Sidcar with wind screen

INDIAN, 1914, 7½ h.p., spring frame, 2-stroke, and clutch, electric lighting, set, electric horn, speedometer, mirror, and coach-built Sidcar, with screen

INDIAN, 1915, 5 h.p., 3-speed, and Special de Luxe Sidcar

RUDGE-MULTI Combination, 1913, 3½ h.p., coach-built, fitted with hood and screen

A.J.S., 1912, 6 h.p., countershaft gear, chain drive, head lamp, horn, rear lamp, and Gloria coach-built sidcar

JAMES, 1915, 2½ h.p., 2-stroke, 2-speed, Lucas lamp set, rear lamp and horn

DOUGLAS, 1914, 2½ h.p. Model V., 2-speed, head light and tail lamp

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## MOTOR CYCLES FOR SALE.

## Humber.

3½ h.p. Humber, 1911, 2-speed Roc, wicker sidcar, excellent condition; £25, or offer; must sell.—S. W. Daniels, High St., Clapham, Beds. [X4525]

HUMBER, 3h.p., 2-speed and free gear box, chain drive, hand clutch, tyres good, M.L. magneto, B. and B.; £12/10.—Charles, Garlands, Caterham. [X8598]

6 h.p. Humber, 2-seater, 3-speed, reverse, Bosch, entirely renovated and overhauled, in splendid condition; £22/10; photo.—224, Belgrave Gate, Leicester. [X8710]

HUMBER, 1913, 3½h.p., 2-speed, torpedo sidcar, new belt, nearly new tyres, machine just overhauled; £22.—Harland, Officers' Club, Rugeley Camp. [X8661]

HUMBER, 1912, 3½h.p., 2-speed N.S.U. gear, free engine, all accessories, 1915 came sidcar; must sell; perfect order; £29, worth £35.—168, Archway Rd., N. [X4589]

HUMBER, 3½h.p., 2-speed; free engine, Canoelet coachbuilt sidcar, lamps, mirror, accessories, splendid condition; £27, or near offer.—135, Woodbridge Rd., Ipswich. [X4700]

1914½ Humber, 3½h.p., 3-speed, and lamp, guaranteed not done 3,000 miles, recently overhauled by makers, splendid condition; £40.—Capt. G. Millyard, 2/1 Herefordshire Regt., Bedford. (L) [X8599]

LIGHTWEIGHT 2½h.p. Twin Humber, perfect condition, very fast, Lucas head light and generator, rear light, spare belt; genuine bargain, £18, no offers.—K., 15, Houghton Rd., Dunstable, Beds. [X4562]

## Indian.

INDIAN, new 1916 5h.p. model in stock; no waiting.—Moss, Wem. [X8751]

PRACTICALLY NEW 5h.p. 1915 3-speed Kick Starter Indian; £55.—Slaw, Langholm Rd., East Boldon, Durham. [X8762]

INDIAN, 1914½, 7-9h.p. combination, 2-speed, mileage 2,000; £48.—25, Hermitage Lane, Child's Hill, N.W. [X4641]

INDIAN, 7h.p. model F, power plus, 1916, with luxurious sidcar, brand new.—Ayscough, Penarth Hotel, Penarth. [X8574]

INDIAN, 5h.p. twin, coachbuilt sidcar, accessories, without fault or blemish; £35.—14, Dodyrooke Rd., West Norwood. [X4675]

INDIAN, 7h.p., 1914, and red Canoelet sidcar, perfect order, extremely comfortable; £50, offer.—32, St. Helens Rd., Hastings. [X8538]

1915 Indian, 5h.p., with Phoenix 1916 racing pot-ter sidcar to match, oil in perfect order; £63.—Salter, 46, Burges Rd., East Ham, E. [X4414]

INDIAN, 1914, 7-9h.p., T.T. model, clutch, extra fine condition, speedometer, mechanical horn; £35.—Layton's Garage, Bicester, Oxon. [X8715]

1914 7-9h.p. Indian, 2-speed, spring frame, electric equipment, Montgomery de Luxe sidcar, hood, screen; bargain, £52.—Langan, 292, Kingsland Rd., London, N. [X4741]

INDIAN, 1914, 7h.p., condition unscored, tyres not marked, fully equipped, 2 speeds, electric light, speedometer, etc.; only run 510 miles; £50.—Knowles, Studley, Warwickshire. [X8600]

INDIAN, 7h.p., 1914 model, with Swan sidcar, excellent condition.—Carlsh, Ltd., 314 and 316, Enston Rd., London. Tel.: Museum 3146. T.A.; Ac Carlsh, Enston Road, London. [X4624]

BRAND New 1915 5h.p. Indian, 3 speeds, clutch, done 600 miles solo work, unscored, all accessories; owner in France; cost £75, first £60 gets it.—Rector, Finningley, Doncaster. [X4768]

INDIAN, 7-9h.p., late 1915, 3-speed, rear sprung, and Millford sidcar, electric and acetylene lighting, every imaginable accessory, absolutely perfect; £55.—14, Dodyrooke Rd., West Norwood. [X4674]

INDIANS, model B £70, model F Powerplus £90, and C Powerplus £75; also sidecars to suit; exchanges; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X4433]

INDIAN Late 1913 Combination, 2-speed, clutch, kick starter, Indian 20 gns. sidcar, lamps, horn, excellent condition throughout; trial given; exceptional bargain, 37 gns.—1, King St., Acton. Phone: 1578 Chiswick. [X4718]

1914 7-9h.p. Indian Road Racer, clutch model, in excellent condition, good speedometer, lamps, horn, and tyres, one tyre new; £32, no offers; on view Monmouth; owner at Frost—Box L1,249, c/o The Motor Cycle. [X4377]

## Ixon.

1915 Ixon, 2½h.p., accessories, splendid condition; £18.—Empson, Gillingham, Sandy, Beds. [X4656]

IXION, 2-speed, footboards; immediate delivery; exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [X4396]

IXION-PRECISION, 4h.p., special engine, and de luxe coachbuilt sidcar, wind screen, locker, and special cover, 3 speeds, free, best Lucas lamps and generators, Lucas black horn, mirror, and £5/5 Cowey speedometer, 2 spare valves and tappets complete, new spare driving pulley, 2 tyres, new tube, spare belt, and new spare carburettor, College leg shields, guaranteed, just on 3,000 miles; lot £44, called up, no carriage paid, cost £94.—Emery, Marlow, Upper From., Caversham. [X4714]

# THE MOTORCYCLE

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## The Employment of Prisoners on the Roads.

**R**EPLYING to questions asked in the House of Commons last week, Mr. Tennant said that, in addition to work found for German prisoners of war in this country in their camps, such as making mail bags, a number were employed in works of public utility, such as labouring on farms and *road making*, at several places in the neighbourhood of their camps, and arrangements were now being worked out for their employment on an extensive scale in timber cutting and work in mines; but as such work would take them into districts which were, as a rule, but scantily populated, somewhat extensive preliminary preparations were necessary. It was a fact that Germany had employed her prisoners in agricultural and other work of a nature to give economic help to Germany. It was hoped to solve shortly the difficulties which had hitherto been found in employing prisoners in small parties, such as were required by farmers, when it was not possible, owing to distance, to accommodate them in camps. We regard this decision as good, if somewhat belated. Readers will remember that we advocated the employment of prisoners of war for road work more than a year ago—to be precise, on March 25th, 1915—but, of course, we recognised that many difficulties would have to be overcome and suitable arrangements made before it would be safe to entrust bodies of such men with tools in sparsely populated districts, and we think the Government have acted wisely. Much work needs to be done upon our main roads, and the sooner it is taken in hand and the more thoroughly it is carried out the better, for the damage caused to our highways by military transport has been very great. Country lanes have, of course, not suffered so much from military traffic in most districts, but the lack of labour has made itself noticeable in many places. This combined with the extremely bad weather experienced during the

winter has left the roads in very poor condition. Unless this damage is rectified in the near future it is likely that the foundations of many of our roads will have to be entirely rebuilt before the pre-war surfaces can be restored, or the roads rendered really satisfactory.

## Tyre Imports Prohibited.

**T**HIS is an age of restrictions and prohibitions, and consequently the decision of the Board of Trade to prohibit in future the import of rubber tyres produced in countries abroad will create no real surprise. As a matter of fact, the decision was reached at the time motor vehicles were prohibited, but we believe that in consequence of pressure put upon the authorities the restriction applying to tyres was removed, only, however, to be reinstated a few months later. The move, of course, is by no means intended as a set against our Allies or friendly neutral countries. It is of the greatest necessity in the interests of the nation to retain in the British Isles the gold necessary to carry on the war, but this object cannot be achieved by importing goods, the demand for which home manufacturers are well able to cope with. It is but one link of a chain all designed to attain the same end, and there seems to be no question of doubt that—at any rate so far as our Allies are concerned—the prohibition will be waived as soon as the war is over, even if an import tariff be instituted.

As regards prices, seeing that stocks of rubber tyres in these Isles are not really low, it is not considered that these will be raised for some time to come at any rate. The amount of motoring being done compared to pre-war days is infinitesimal, and what is indulged in is purely recreative or by men on business bent, so that the consumption of tyres does not nearly approach the level of the days of peace. There are many other things to which this prohibition might with advantage be also made to apply, but we will not attempt to enumerate them all.





### Gott Strafe England!

I possibly suffer from the unenviable distinction of being the only Englishman whom the Germans do not hate! At any rate, I have just received news from a civilian interned in the big concentration camp at Ruhleben that he has read one of my articles reprinted in a German motoring journal, which referred to me in quite complimentary fashion!

### Wheeling a Heavyweight.

A veteran rider remarked to me the other day that he had regretfully taken to the baby two-stroke, because increasing years had not lightened the labour of wheeling his pet 7 h.p. twin about when its engine was temporarily at rest. The obvious answer was, "Why wheel it?" The heaviest twins are easily manipulated if the rider straddles them with the clutch out, in lieu of leading them about by the handle-bar.

### Decarbonisation on Car Engines.

Readers who are *au fait* with the trend of motor car design will be aware that decarbonisation problems are being tackled with real earnestness in that sphere. Until the last year or so, the decarbonisation of a motor car engine was a perfectly fiendish job. It necessitated the removal of either one or two heavy castings, consisting of from two to four cylinders, complete with their heads and water jackets. It was barely possible for a Hercules to tackle it single-handed, even with the aid of blocks, chains, and hooks; if he did, it would take him many hours. The normal procedure took two men the best part of a day. Then the detachable cylinder head became increasingly popular, but even this improvement fell short of the ideal. It enabled an amateur to decarbonise a four-cylinder 20 h.p. engine single-handed in two hours; but it rendered the valves extremely inaccessible, as valve caps were eliminated; and if piston rings required attention, the piston at fault had to be drawn out through the bottom of the crank case. *Per contra*, some authorities hold that the elimination of the valve caps reduces the tendency to knock (usually called "pinking" by car drivers), as each valve cap represents a lump of almost uncooled metal, and so leads to uneven expansion, and to steam pockets in the water jackets. The car world is now moving towards the following design of engine: (1) Detachable cylinder head; (2) including overhead valves, which come away with the "loose head"; and (3) the cylinder barrels being cast separate from the top half of the crank case, so that the piston rings are accessible from above in the event of their failing.

### Decarbonisation of Motor Cycle Engines.

It is obvious that the above progress is on lines adapted to vertical four-cylinder engines, and is, therefore, largely devoid of meaning for users of motor cycles, amongst whom the four-cylinder engine is little known. Still, several deductions may be drawn. A four-cylinder engine of this type, if mounted in a two-

wheeler, would be free from the only important criticism to which four-cylinder motor cycles are at present subject. Again, decarbonisation is an even greater nuisance to us than it is to car owners; and whilst the nuisance is being annually reduced for car owners, it is actually becoming worse amongst us, as the various types of twin-cylinder gradually gain the mastery over the vertical single-cylinder. Our designers ought to be doing something. Car design suggests that the detachable cylinder head, with overhead valves, is the way out. So far as motor cycles are concerned, this would only be a return to the original De Dion practice of fifteen years ago; and it is now emphasised by the probable introduction of steel cylinders on future engines. At the present moment, the job of decarbonising most horizontal twins and all the big V twins is about as long and toilsome as it can possibly be. But it is plainly an easy matter:

(a) To construct a simple and gasproof joint between a cylinder barrel and its head.

(b) To construct overhead valves, which are fracture proof.

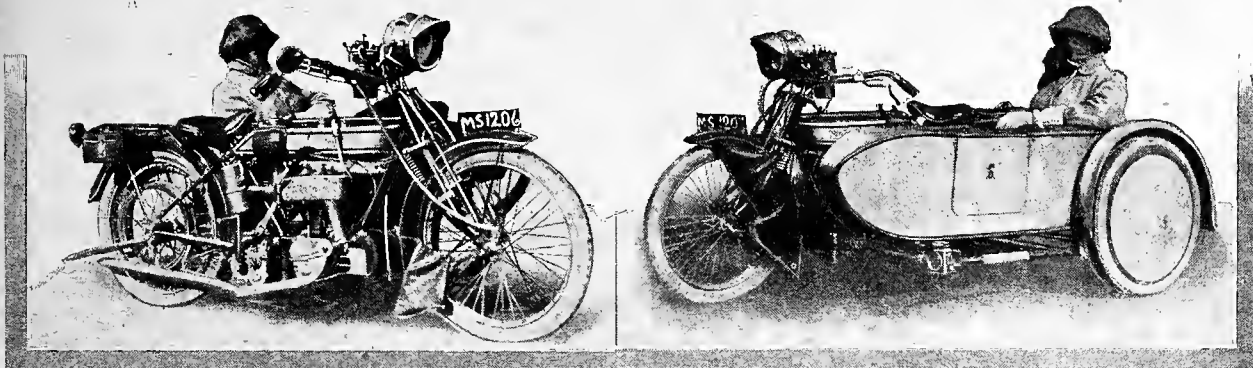
This single alteration would reduce the time required for decarbonising many twin-cylinder engines by about 75%. Why are our designers so unnecessarily stationary?

### Four Speeds v. Three.

The average motor cyclist regards the provision of a fourth gear ratio as an academic question (if he is a 'Varsity man') or as a talking point (if he has trade connections). I will go so far as to say that no rider accustomed to four gears will readily return to three. The position is as follows. You must have your top gear pretty high for road-burning and ticking down grades. You must have a real emergency low gear, which will rule out mountains. Between these extremes you may either have one intermediate ratio, which must serve two functions—it must take you along at a decent speed under circumstances where the top gear is just too high, and it must give you violent acceleration on hills where a top gear rush is impracticable, or moderate acceleration where the going is too tricky for lively work on a  $4\frac{1}{2}$  gear, e.g., in thick traffic. Now a single intermediate gear ratio can only combine these two functions on a very light and powerful machine, where the percentage of power to weight is rather high, e.g., on a  $3\frac{1}{2}$  h.p. 150 lb. T.T. pattern mount. On heavy solo machines, and *a fortiori* on sidecar machines, you very often need a gear which is only fractionally lower than top gear—say,  $5\frac{1}{2}$  instead of  $4\frac{1}{2}$ —but a  $5\frac{1}{2}$  gear means a slow get-away in traffic or round a bad corner at the foot of a steep pitch; and in sidecar work this slight reduction down to second gear is useless. So the three-speeder usually has a compromise intermediate of  $6\frac{1}{2}$  or  $7\frac{1}{2}$ , which is either too high or too low to be ideal in nine cases out of ten, but the four-speed box gives you all you want.

# THE FIRST THOUSAND.

An Officer's Impressions of a Big Single Sidecar Outfit.



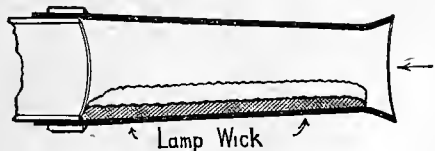
The 4 h.p. Norton sidecar referred to in the accompanying article.

**T**HE following notes on the running of a big single sidecar outfit may interest those readers who are already sidecarists, and may convince some who are contemplating the acquisition of a sidecar that it is not at all necessary to indulge in a big 1,000 c.c. engined twin in order to enjoy thoroughly satisfactory sidecaring.

The machine in question is a 1916 4 h.p. Norton three-speed countershaft machine and a sporting model Norton sidecar.

The engine is the 82 x 120 mm. 633 c.c. long stroke single, which Mr. Norton has designed primarily for sidecar work. The cylinder casting is a good piece of work, and usually excites admiration because of the sensible size and disposition of the cooling fins. The crank case is devoid of all dirt-lodging crevices, and is remarkably oiltight even under the extremely liberal lubrication to which I treat my engine.

The C.A.V. British magneto I have enclosed in a home-made leatherette shield, and will interest me no more until the engine goes into dock for a clean up. The plug I am using is my sole remaining memento of Hun-land, to wit, a single-point Bosch.



Air funnel attached to Binks carburetter with lamp wick to catch blow-back petrol.

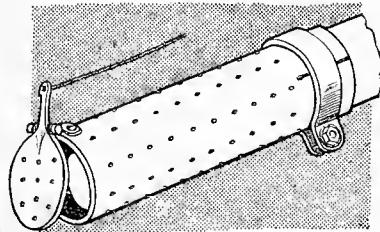
A Binks three-jet carburetter supplies the gas. With No. 2 petrol I am using jets No. 00, 4, 8 respectively. I have removed the bottom air adjustment clip and fitted a long air pipe, retaining the gauze at the inner end of the pipe. I find that dirt does not choke up the gauze nearly so quickly when it is placed in this position as when the gauze is placed over the end of the main air pipe.

On the bottom of the air pipe I have placed a strip of thin lamp wick. The petrol "blow back" is absorbed by this wick, and is vaporised by the ingoing air. The plain air pipe naturally catches this blow back, but gives it up to the ingoing air in an improperly

vaporised condition. The wick gives the petrol up in a very finely atomised state. The idea is at present being tested, and I have come to no definite conclusion about it. I should like some opinions on it. My carburetter is certainly *delightfully automatic* and *economical* since fitting the above.

## The Silencing Arrangements.

I have had a plain T.T. exhaust pipe fitted in place of the standard tangential silencer and pipe. I enjoy the deep rumble that issues from the region of my back wheel when the engine starts, but unfortunately the police authorities have no ear for music, so I have had to devise a means of putting on a pianissimo stop.



Exhaust pipe extension and quietening device.

A piece of steel tubing 8 in. long, which was just a tight fit over the end of the T.T. pipe, was chosen. I drilled about eighty  $\frac{3}{16}$  in. holes in it, and over one end I fitted a hinged lid, also perforated by a number of  $\frac{3}{16}$  in. holes. This fits over the end of the TT pipe, and in towns the lid can be closed down, and the engine exhausts with remarkable silence through the small holes. In the open country open exhaust can be enjoyed with a reasonable degree of silence.

## The Transmission.

The gear box fitted is this year's Sturmey-Archer countershaft, and to my mind it is the finest one extant. It is as near foolproof as anything can reasonably be, and gear changing can be done with the ease and silence of a Rolls-Royce gear box. I have the chain-cum-belt model, giving me 5.14 to 1 top gear,  $8\frac{1}{2}$  to 1 second, and about  $13\frac{1}{2}$  to 1 bottom. When sent out the machine was fitted with an engine sprocket giving higher ratios. The fitting of the lower ratio sprocket has been a great improvement in respect of flexibility. Naturally top speed on the level has dropped (about 5 m.p.h.), but the average road speed has improved.

### The First Thousand.—

The clutch (cork insets h.b. controlled) has been a treat. I am contemplating fitting dual control to the clutch operation by fitting a pedal and Bowden wire stop on the right footboard. I can thereby utilise the one Bowden wire for both hand and foot control.

Belt wear has been excellent. Slip has been practically non-existent, and the breaking of one fastener hook has been the only trouble to record. I am using a Lycett rubber-leather belt, and it is doing very well.

### A New Cooling Device.

To add to the efficiency of my engine I have designed and made an auxiliary radiating system, using copper, with its high specific heat as the most suitable medium, and I flatter myself the appearance is considerably less unsightly than the average auxiliary radiator set. The copper takes on an excellent shine and looks very well. I hope in a short time to give some figures, temperatures, etc., which will substantiate the opinion I already have of the efficiency of my device. On starting the engine, with the machine stationary, the radiators soon become warm and then moderately hot. In 200 yards after starting the heat has been almost entirely dissipated. Hills such as Dover Castle, Folkestone, etc., can be roared up on second gear *all out* 25-28 m.p.h. with the back of my bare hand pressed on either radiator. Within twenty-three seconds of stopping the radiators become unbearably hot to the bare hand, showing there is efficient heat conduction between cylinder and radiators. Lubrication under these circumstances is excellent, as the oil in the cylinder walls never attains to a very high temperature. I expect to find that carbonisation will be markedly reduced, and my petrol consumption over the same roads, etc., has improved from 68 m.p.g. to 72-74 m.p.g. Considering that my running is mostly done in a hilly portion of Kent, and involves about five miles of traffic work for every nine or ten miles of open country, I consider my petrol consumption is quite good. I have hopes of testing it on a long run, and am counting on over 80 m.p.g.

### The Arrangement of the Controls.

Wide semi-T.T. bars give excellent control of the machine, but are not so comfortable over a long distance as the much maligned T.T. bar. Terry's links have replaced the pair of rigid links at the top of my Druid forks, and I know of no better 12s. 6d. worth that can be spent on a machine. They absorb the

more horizontal road shocks that escape the damping of the main Druid springs, and render the handle-bar as vibrationless as a well sprung sidecar. To watch them at work on a pot-hole road is a revelation. They absorb vibration like a blotting paper soaking up ink.

My clutch control I have placed at my left hand, valve lifter and throttle controls together on the right bar, and the seldom used front brake lever I have placed in the inside position on the left bar. This I have found the most convenient arrangement.

The sidecar is the Norton sporting model, semi-streamline body, disc wheel, all finished in lilac blue. Four-point attachment to the excellent

Norton frame sidecar lugs is used. My sidecar can be detached or coupled up in a very few minutes.

The sidecar is very comfortable to ride in, and the very accessible locker behind the passenger in the bulbous tail is a convenience that must be experienced to be appreciated. Petrol, oil, and wet weather riding apparel can be conveniently stored here; and, thanks to excellent suspension of the sidecar body, they do not shake about.

The outfit holds the road excellently, steers well, and is very comfortable for both driver and passenger. When geared about  $4\frac{1}{2}$  to 1 I have attained 51 m.p.h. on the level with a ten and a half stone passenger, so that the engine has got plenty of vim in it.

### Easy Starting.

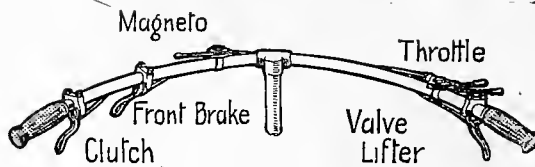
The reliability has been monotonous. I have not needed to apply a tool to the machine, except to replace a broken belt fastener hook. The engine starts every day I use it first or second kick from cold, *no injection*, and does its day's work with the regularity of a Waltham watch.

I always feel sorry for those riders who write *The Motor Cycle* for advice on their engine starting troubles. Copious injections of petrol overnight or just previous to their daily struggle, frantic pushing

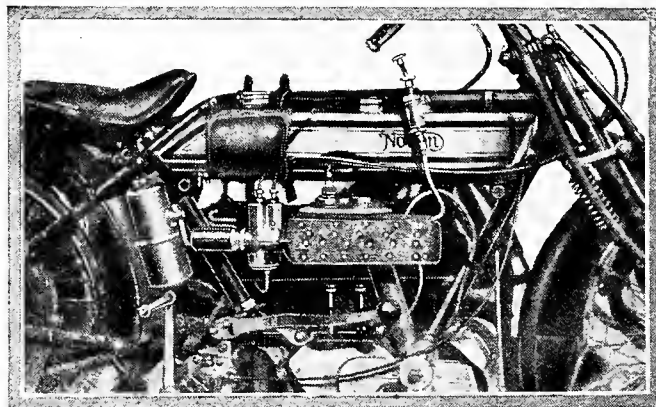
or kicking at a starter, can all be avoided by a little care and adjustment carried out by the rider himself.

For lighting the outfit I have two F.R.S. head lights supplied by a Low generator. With varying lighting restrictions everywhere, the controllability of the flame given by this generator is most enjoyable. The generator certainly does everything the makers claim for it. My Dunlop tyres still have their original quota of air, and wear of studs is not yet in evidence. To say I am pleased with my outfit is superfluous.

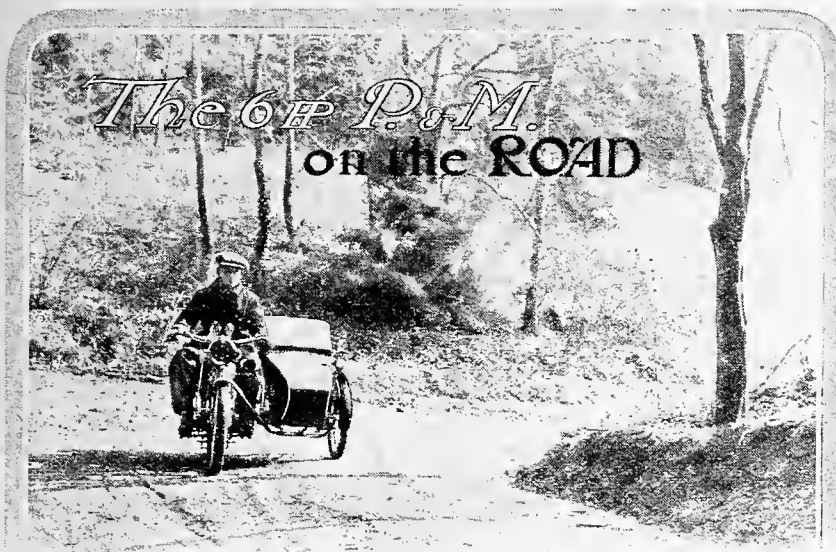
ALEXANDER LINDSAY, M.B., CAPT., R.A.M.C.



Arrangement of control levers on Capt. Lindsay's Big Four Norton.



The Big Four Norton, showing auxiliary copper cooling device designed by Capt. Lindsay.



The 6 h.p. P. and M. taking the bend on Combe Bottom. At the point shown the gradient is 1 in 5; the P. and M. climbed the hill twice in succession with a full load.

UP to within a short time ago we had had very little road experience of the new 6 h.p. (76 mm.  $\times$  85 mm.) 90° P. and M. twin, but when the invitation was received from Mr. B. Mariani to take an extended run in one of these combinations we accepted it with alacrity. It was as long ago as November 19th, 1914, that we described this fine machine, and since that period some little improvement has been made, but naturally as the whole of the firm's output has been taken over by the Government, very little attention has been devoted to the new model.

#### The Four-speed Gear.

At the present time it has reached the stage of almost complete finality, with the exception of the change speed gear mechanism, which still needs simplification. We may recall that the P. and M. four-speed gear box is a combination of the dog clutch gear and the well-known expanding P. and M. The dog clutch gear merely serves the purpose of lowering the ratios of the P. and M. gear, and no matter whether the gear box is in use or not the expanding gear serves as a friction clutch on either of the speeds. The small lever shown on the tank in the illustration is drawn backwards so that the dogs are engaged. This means that the two lower gears are in operation. Therefore to start, the pedal on the gear box is kept horizontal; this puts the gear in neutral. To start, the pedal is pressed down with the heel and the drive is taken up on the low gear, while pushing forward the pedal engages the second speed, but to engage the third speed the pedal and the lever have both to be actuated at the same time. To engage the top the lever only is pushed straight forward, and the exhaust valve lifted or the throttle shut. The company is now engaged in designing a simple gate which will enable all these operations to be carried out by means of one lever.

The chief modification in the machine in which we were taken out is the dynamo drive, which is taken

off the layshaft of the gear box and is carried out in a very simple and efficient manner. A detail improvement has also been made in the actuation of the dog clutches; this is now carried out by means of a rack and pinion operating the worm which moves the fork in the gear box and shifts the dogs.

The outfit reached the appointed place dead to time, and within a very few minutes we were ably piloted westwards out of London by Mr. Chidley, one of the P. and M. demonstrators. Emerging from Roehampton Lane at Alton Road, which is quite a respectable gradient with a sudden approach, the machine astonished us by climbing on top speed, especially as it is a hill which calls for a change down on most motor vehicles. Kingston Vale is exceedingly rough, and over this surface we were pleased to note the exceedingly comfortable riding of the sidecar. The back possesses a

very deep spring cushion, and the body itself is, moreover, suspended on very carefully selected C springs, which render the riding most luxurious; in fact, it would take a very expensive car to provide such comfortable riding as the P. and M. sidecar affords. Kingston Vale was taken at a very comfortable speed, and here we appreciated the even running of the engine and the absence of vibration.

Our journey was continued along the main Portsmouth Road, past the Hut, and on through Ripley to the fork a mile from that village, where we turned to the left, and went through West Clandon to Newlands Corner, taking the hill which was the scene of the Army and Navy hill-climb last autumn. This caused another surprise, as the engine comfortably took that quite considerable gradient on third speed, and accelerated well after the first bend had been negotiated. All the time we had been travelling against a very stiff north-westerly gale, but this happened to be more or less in our favour as we took the hill. Near the summit rain came down in torrents, and we stopped for shelter under some friendly trees. Here we met several wounded soldiers from an adjacent hospital enjoying an outing in the country. Two were walking, one was driving a pony chaise, when suddenly another pony chaise came hurtling down the hill "all out" with the seat empty, and the pony apparently out of control. The pony made for the sidecar like a bull at a gate, but fortunately saw it in time and swerved to the left, missing a water cart by a hair's-breadth, and bolted away out of sight. Its acceleration as the gradient increased must have been extremely rapid. What happened to it we know not. The incident evidently caused no little amusement to the one or two convalescent men who followed afterwards.

#### Up Combe Bottom.

We next made our way down the beautiful road which flanks the hill, from which the finest view is



**The 6 h.p. P. & M. on the Road.—**

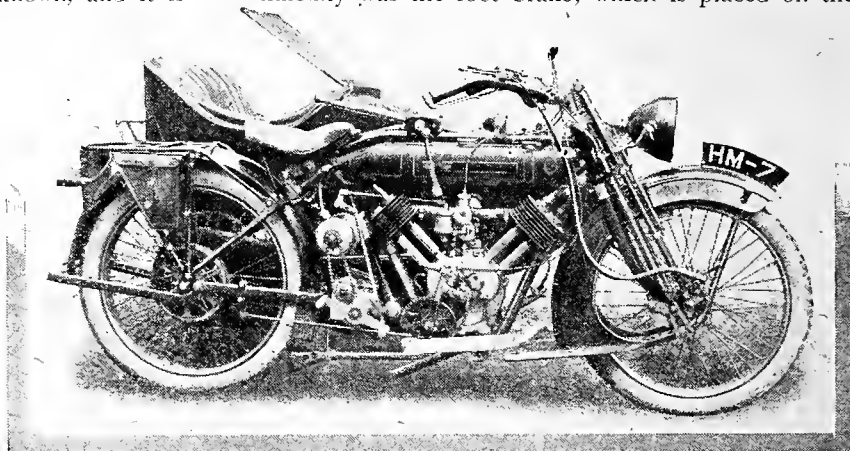
Surrey can be observed, and, passing the Silent Pool, we made for Shere. At the entrance to the village there is a signpost pointing to Effingham and Leatherhead. Taking the acute angle curve we made our way up the country lane which ultimately terminates in Combe Bottom, a well-known Surrey test hill, which was included in the One Day Trial some three years ago. Even now it is not very well known, and it is quite a good test. The surface was extremely rough, and became worse as we got higher, and necessitated a change to third speed, especially as we had received a rather bad check at the bottom through meeting a herd of beautiful Jersey cattle. The surface, though rough and loose in places, was negotiable, but at the corner, just where the gradient is 1 in 5, the road was tolerably good, and the climb was made in excellent style on second speed. Here we stopped and took a few photographs, then continued over the high land and through the woods, whose winter sombreness was just beginning to be relieved by the vivid green of the budding larches.

Then we joined the Leatherhead-Guildford road, following this as far as Effingham, where turning left again we met the Portsmouth Road, and stopped at the Hut for tea.

**A Tenacious Mount.**

Afterwards we took over the combination and found it to be exceedingly comfortable to drive, possessing ample acceleration, wonderful staying power, smooth running thanks to the excellent balance of the 90° twin, plenty of power, but not very much speed, though we must admit we did not attempt to push it at any time. It gave us the impression of being an exceedingly comfortable machine which was capable of keeping up an even pace all day and under all conditions.

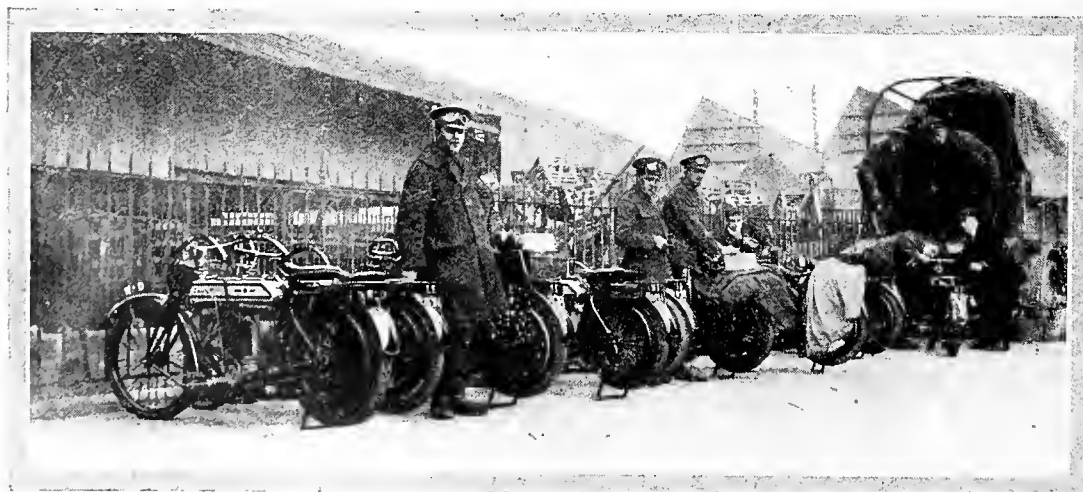
There is practically no slowing for hills, and the way the machine battled against the heavy head wind on the outward journey was quite a revelation. The position of the driver was comparatively as comfortable as that in the sidecar, and certainly the Lycett saddle on which we were seated was exceedingly well sprung. We found the change speed with the two pedals and lever not too difficult. The only real difficulty was the foot brake, which is placed on the

**A SIDECAR OUTFIT DE LUXE.**

The 6 h.p. 90° twin P. and M. This machine is not at the moment on the market, though it has been on the road eighteen months. Upon the conclusion of peace it will be offered to the public as a thoroughly tested article. Dynamo lighting, a four-speed gear, and all enclosed chain drive are features.

near side of the machine instead of the off side, where we had been accustomed to find it with our old reliable 3½ h.p. of the same make.

Altogether it was an exceedingly enjoyable ride, and we found the machine, after practical road experience, to be in every way worthy of the famous firm which produced it. Although times without number the engine was allowed to slow down to such an extent that any ordinary engine would have konked itself to a standstill, the new 90° P. and M. twin stuck to it magnificently, and never a sign of a knock or konk could at any time be discerned.

**LOADING UP MILITARY RUDGES.**

Twelve of these were returned to the factory for repairs, and they were in such bad condition that the work cost over £180. Only necessary repairs were carried out, as the machines, so the makers were informed, "were for the training of novices." Surely it would be better to enlist expert riders for the despatch riders' section of the R.E.!

## MILITARY NOTES.

News of Military Motorists from Many Parts.

## MUD IN MESOPOTAMIA.

WE have heard a good deal of mud in Flanders and mud in Macedonia from the military motor cyclists' point of view. But mud with riders in Mesopotamia has not been called attention to before now. However, the photograph we are enabled to reproduce, through the courtesy of Motor Cyclist R. V. George, who is attached to an M.T., A.S.C., Company in Mesopotamia, shows that it is not only in Flanders and around Salonika that our despatch riders find the roads rough going at times. Strictly speaking, a true comparison cannot be made between France and Mesopotamia, as the former has roads, however bad they may be at times, whereas in the case of the latter it is desert pure and simple.

The photograph provides a graphic idea of the camel track mud, in that the machine—a 1915 Triumph—is standing up without stand assistance. The machine is standing just as George got off it. In the wet season the camel tracks are most difficult to follow, as well as being trying to ride upon.

A REMINISCENCE OF THE  
"CLAN MCTAVISH."

READERS will remember the description in *The Motor Cycle* a few weeks ago of the experiences of an Australian on board the *Clan McTavish*, the boat that put up such a plucky fight with the German raider, the *Möwe*. The Australian in question, Arthur Du Bois, of Sydney, was on his way home to enlist in the Motor Machine Gun Section, but he gave his parole to the Germans who captured the *Clan McTavish*, and consequently, when he finally landed in England, the Foreign Office refused him permission to take up combatant service. However, Du Bois is now driving a car for the Society of Friends, who are doing so much good work for the refugees behind the firing line in France. At present he is stationed about twenty-five miles from Verdun, and when the wind is in a certain direction he can hear firing quite plainly.

## BETTER THAN THE TRENCHES.

AT a mechanical transport depot near London the motor cycle men sleep in what were at one time horse boxes. The men have made them extremely comfortable, and besides being used for sleeping purposes—four men to each box—they are also used for the storage of motor cycles.

## TRACING WAR-MADE FRIENDS.

PUBLICATION in our Military Notes of letters (the last in our issue of April 27th) from P. O. G. L. Rossiter has led to a reader, who was a



"SOME" MUD.

A military rider's Triumph standing up in the mud without stand assistance on the road to Zubair, Mesopotamia.

comrade of his in the early days of the war, hearing of his whereabouts. The reader in question, R. L. Nye, who is now a despatch rider with the Royal Flying Corps, was with Rossiter at an R.N.A.S. camp near Dunkirk, and the two had many a game of ship's quoits together.

On several occasions our "Naval and Military Notes" have been the means of war-time acquaintances tracing one another.

## THE ACTIVE SERVICE PRESS.

TO the list of papers published, and in many cases printed also, just behind the firing line in France, given in our issue of March 23rd, must be added that named *The Brazier*, and through the courtesy of a reader who is in the

A.S.C., M.T., we have had an opportunity of seeing a copy of *The Brazier*, which is printed at the Front by the 16th Battalion the Canadian Scottish. *The Listening Post*, by the way, is also the publication of a Canadian regiment—in this case, the 7th Canadian Infantry Battalion. Both are excellent publications, and contain some very amusing portions.

We have just received the April, being the second, number of *On Service*. It is published at G.H.Q. by the members of an A.S.C., M.T., Ammunition Park. It is even more amusing, if that were possible, than the first number. Lt. S. A. Rowlandson is publisher, the paper being edited by one of the park sergeants with the assistance of the N.C.O.'s and men.

PERTH (W.A.) MOTOR CYCLISTS  
ON ACTIVE SERVICE.

TWENTY-FIVE members of the Perth (Western Australia) Motor Cycle Club are now on active service. Perth is not a large place—the population is only 36,000—so that it is quite a good record.

## THE DANGERS (?) OF DESPATCH RIDING.

IN our issue of April 20th, page 376, we drew attention to a lurid account, in an American contemporary, of the dangers to which despatch riders are exposed when on duty. It was stated that out of a corps of thirty-one riders with whom the writer started on duty at Ypres only four were alive when he left.

Needless to say, this is a greatly exaggerated statement, and if any proof is required it is furnished by a letter from a D.R. attached to the 50th Div. (Northumbrian) Sig. Coy. This section has served in France for over twelve months, and so far it has never had a casualty due to shell fire or other similar risks.

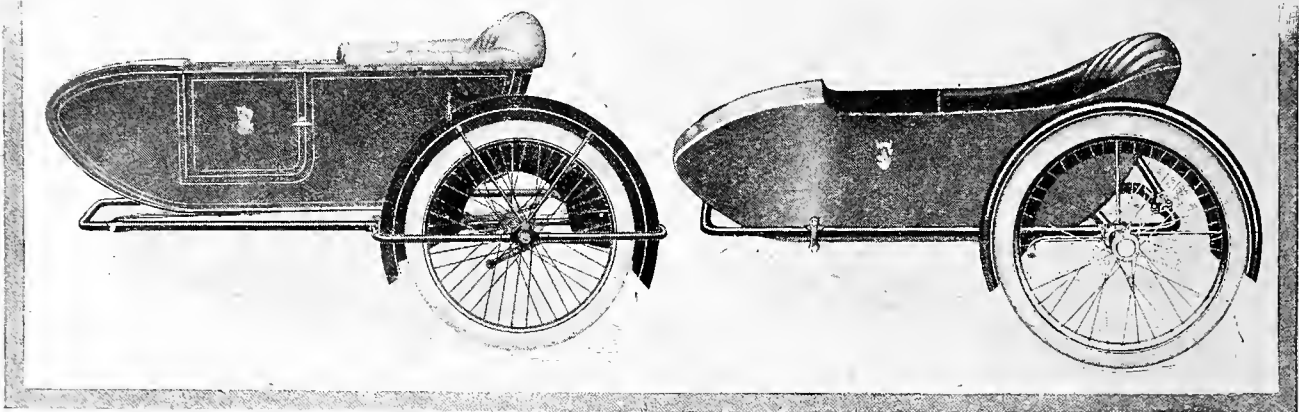
The members of the section are shown in the illustration on this page.



Despatch riders of the 50th (Northumbrian) Division Signal Company who have seen over twelve months' active service. From left to right (front row) Cpl. L. Barton, Art.-Cpl. C. Armstrong, Cpls. Duffy, O. Birse, and Crute; (middle row) Cpls. J. Wood, Taylor, W. Dixon, Sgt. Bartram, Cpls. Todd, T. Hudson, and Baker; (back row) Cpls. T. Turnbull, F. Monty, Thornton. Preston, and Hacking.

## EMPIRE SIDECARS.

Large Range of Models from a Splendidly Equipped Factory.



Military and lightweight models of the Empire sidecars.

**A**MONG the many different sidecars manufactured by Messrs. Lowe's Empire Sidcar Co., of Great Charles Street, Birmingham, probably the most attractive is the "Military" model. This has been specially designed for hard work, and is being supplied in large quantities for service purposes. Its general appearance is very pleasing, while the careful attention to detail, combined with good workmanship, make it a most suitable outfit for really hard work.

The main chassis is rectangular in shape, and is built of extra heavy gauge cold drawn weldless steel tube. The wheel is supported on both sides by means of a special frame constructed to carry it. The wheel is thus carried in a similar manner to the rear wheel of a cycle, which entirely does away with any risk of broken or strained wheel axles. Although the wheel is entirely enclosed by the frame, the accessibility for tyre repair is practically unaffected, as it is very readily removed. The forks in which it is supported are slotted, so that directly the nuts are released the wheel drops downwards, and can then be easily removed from the frame. When in position the wheel is securely locked in the frame by two recessed washers which fit over the spindle and engage in a corresponding recess in the auxiliary frame. Between these recessed washers and the locking nuts are two washers

honeycombed with holes. The wheel is then locked up by the usual spindle nuts, which are prevented from unscrewing by a set screw which engages with the drilled washers.

### Mudguard Attachment.

An extremely good point about the chassis is the method of attaching the mudguard, owing to the fact that the frame encircles the wheel it is possible to support the guard from both sides, and the fact that it is attached at several points eliminates to the greatest possible extent any tendency to rattle. The guard is wide and fitted with a deep valance. A most substantial stand is provided to jack the wheel up for adjustment or tyre repairs.

Four-point attachment is adopted, and a variety of clips may be obtained suitable for practically all the leading makes of cycles. The connections are all quickly detachable, and consist of heavy steel forgings of a rather novel design. The two sockets which fit one within the other are held tightly together by means of a flat wedge-shaped bar, which is driven into a socket machined through the two fittings. When tight, it is locked firmly in position by means of a set-screw.

The diagonal rear attachment stay on all Empire models is attached to the chassis as near the wheel as possible—a very sound construction, and a point often

omitted in modern sidecar construction. The body is sprung back and front, the rear springs being of the C variety with shackles, while the front are flat laminated. The plates on which the springs rest are all brazed to the chassis, the springs being clamped down by substantial plates and bolts. A point worthy of note is that all nuts are castellated and fitted with split pins.

The body is of the coachbuilt pattern, and is made of hydraulically pressed steel panels. It is thoroughly well upholstered, and can be finished in any colour to match any machine. A similar model to the Military is the Empire American, this being fitted with a 28in. wheel, and painted to suit the leading American machines.

### The Lightweight.

Another interesting model is the lightweight. In this model the sporting shaped body is underslung through the rectangular chassis, so that a very low riding position is obtained.

During our visit to the Empire works we were much impressed by the size and the completeness of their equipment. We understand that, although the firm is fully engaged on executing Government contracts, it is in a position to supply and give prompt delivery to the trade or public with practically any of its models, owing to an enormous reserve stock.

## A CHEMICO BODY SHIELD.

**W**E were present on Wednesday last week, at Anderton's Hotel, at the demonstration of the Chemico body shield, lately introduced by the County Chemical Co., Ltd., Bradford Street, Birmingham. The body shield consists of a waistcoat which may be used to protect the front and also the back of the body from bayonets, bomb splinters, revolver bullets, shrapnel, and other projectiles, except those of high velocity unless they be more or less spent. The shield is composed of a series of forty-two strips of material, treated with a resin-like chemical, and arranged somewhat in the manner of the slats of a venetian blind, while khaki colour

cloth covers the whole. Though thick, it is light, weighing 4½ lb., while it is also waterproof. There is no metal whatever in the body shield. In explaining the claims for it, Mr. Wilfred Hill, chairman of the company, said that he considered it to be also invaluable for the protection of the tanks of aeroplanes, motor cars, and motor cycles. It covers a large area of the body, and is treated with a chemical which renders it anti-septic. The first test consisted of an attack on the body shield, which was strapped over a large sack of bran, by a soldier armed with a rifle and bayonet. The soldier lunged vigorously at the dummy, but did not succeed in pene-

trating the body shield. Next about ten shots from a revolver were fired at it, and of these only four succeeded in penetrating the material, which was explained by the company as being due to the fact that the dummy had been dented by the attacks of the bayonet. We should have been interested to have seen the effect with an automatic pistol, which has a muzzle velocity of about 1,150ft. per second, against the 750ft. per second muzzle velocity of the .455 Service revolver. We are confident, however, that the body shield would be capable of saving a number of casualties such as are inflicted daily by half-spent projectiles.

# THE DUBLIN EASTER TRIAL.

A Belated Report of an Event that had an Exciting Ending.

OWING to circumstances that do not call for any apology from us or from our usually reliable Irish correspondent, beyond a statement that the six days rebellion in Dublin somewhat upset the wonted regularity of the postal and telegraphic communication with the Emerald Isle, we were unable to publish in the usual course a report of the one day trial of the Dublin and District Motor Cycle Club held on Easter Monday. And for the reason that most of the members of the club since that date and up to the present have been "on active service" in their native city, and district as members of the Motor Cycle Volunteer Despatch Riders' Corps, no results of the trial are available, although in the ordinary course of events they would by now be ancient history. The trial has, however, an historic interest, if only by reason of the fact that it will probably be the last event of the year under the auspices of the club.

When the competitors reached Donnybrook on the conclusion of the trial on Easter Monday afternoon they heard of the insurrection that had taken place in Dublin during their absence. They were inclined to regard it as a joke, and were little upset by the news that no trams had run from mid-day; but those of them who had to cross the city to reach their respective homes soon found it was a joke of a very serious nature. Of their adventures—perilous adventures in many cases—much might be written, but the columns of *The Motor Cycle* are hardly the place to record them. Suffice to say that none suffered any casualties.

## The Starters.

The competition took the form of a reliability trial over a distance of about 145 miles, the greater part of the course lying amongst the mountains of Co.

Wicklow. It looked at one time as if it would be impossible to hold the event, as, owing to the pronounced shortage of petrol that had been experienced in Dublin for some time past, it was with great difficulty that the club was able to arrange for a supply at the turning point at Woodenbridge. The uncertainty as to the event coming off caused the entry to be on the small side, only thirteen names, being sent in for the event, and of these twelve took part, their names being as under:

W. J. Henderson (7-9 Harley-Davidson sc.)  
T. Woods (2½ Allon)  
D. Doolin (2½ Douglas)  
S. Allen (3½ James)  
P. H. Hurse (4¼ B.S.A.)  
P. J. Fox (3½ Sunbeam)  
L. Carter (7-9 Excelsior sc.)  
S. Redmond (3½ Indian)  
C. B. Franklin (7-9 Indian sc.)  
A. Carton (7-9 Indian sc.)  
M. C. McDonough (4¼ B.S.A.)  
W. T. Jameson (5 Indian)

The start took place from Inchicore, and the competitors were sent away at one minute intervals from nine o'clock.

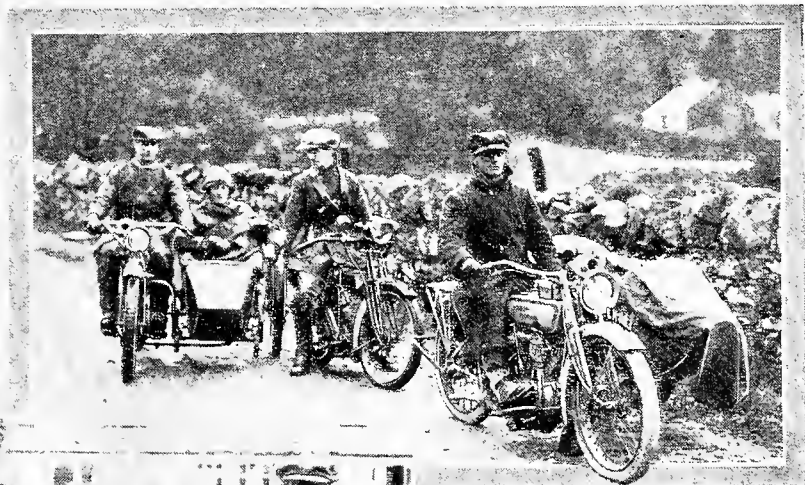
## A Sporting Route.

The route ran through Rathcoole, Naas, and Ballymore-Eustace, where the men

turned eastward to Hollywood, crossing the mountains by Wicklow Gap. The long ascent was in fair order, and few of the competitors were penalised. From Laragh the military road was followed over the mountains to Drumgoff, and from the valley of Glenmalure to Aughavanagh and Aughrim, and thence down the valley to the luncheon place, at Woodenbridge.

After an hour's interval the return journey was resumed, and the route was traversed in the reverse direction as far as the Vale of Clara, this section proving no less severe than when taken from the north. The competitors then proceeded to Rathdrum, Rathnew, and Ashford, to make once more the ascent of the mountains by Ballymacroe Hill and Roundwood to Sally Gap. From that point the military road was again followed to Glencree Reformatory, and, after passing through the valley of Glencree, the last test hill of the day, the Devil's Elbow at Glencullen, was tackled. This proved a very severe climb, but all of those who survived up to this point succeeded in climbing it.

The weather conditions were very bad for the greater part of the day, and the



(Top) Waiting in the Vale of Glenmalure. The riders, left to right, are: C. B. Franklin, S. Allen, and W. J. Henderson. (Left) D. Doolin (2½ h.p. Douglas) checking in at Woodenbridge. On the left is P. J. Fox (3½ h.p. Sunbeam) and on the right T. Woods (Allon).



### The Dublin Easter Trial.—

severity of the course resulted in the proportion of finishers being remarkably small. Those who finished were:

T. Woods (2¼ Allon)  
C. B. Franklin (7-9 Indian sc.)  
P. H. Hulse (4¼ B.S.A.)  
L. Carter (7-9 Excelsior sc.)  
A. Carton (7-9 Indian sc.)

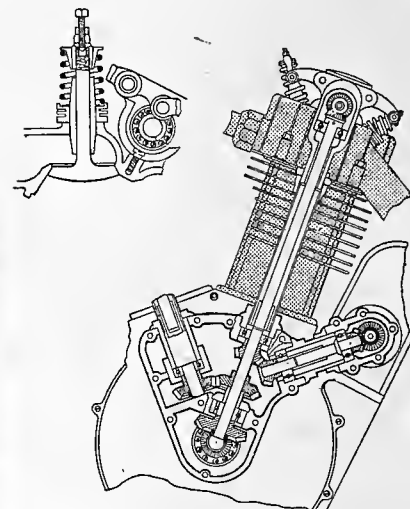
Owing to the rebellion, the military authorities have taken charge of the petrol supplies in Dublin, and none of the importers can deliver spirit to civilians without a military order. This

does not mean that supplies are altogether unavailable. Spirit is being issued in limited quantities to retailers, and they are free to supply their customers.

### NOVEL VALVE GEAR.

THE accompanying sketch shows, a novel method of overhead valve gear, the novelty being in the bevel drives. It is a patented design of an American, Andrew Strand, of St. Paul, Minn., and the object is to lessen fric-

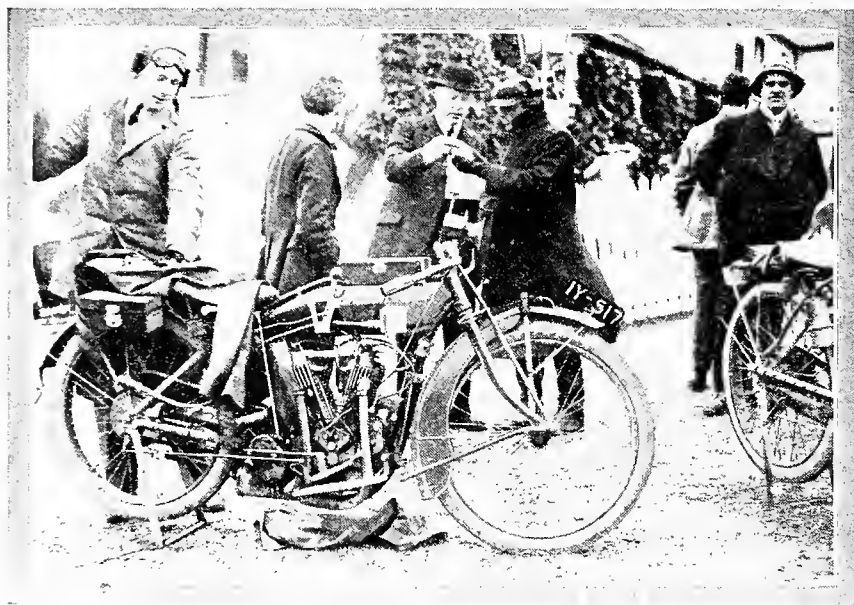
tional stresses caused by the valve gear and thus obtain more speed. The design involves the use of seven pairs of bevels, and we understand that it is being employed on the twin-cylinder Cyclone models.



Bevel-operated overhead valve gear mechanism used on an American machine.

From the drawing it will be noticed that the main shaft carries a bevel pinion meshing with a bevel gear on the end of a shaft parallel with one of the cylinders.

The forward shaft carries another set of bevels to drive the shaft for the rear cylinder of a twin-cylinder engine and a third set to drive the magneto. The valves in each case are operated by cams on an overhead shaft acting upon their respective rockers.



Scene at a control. The figure on the left is D. S. Jameson (5 h.p. Indian), a midshipman on H.M.S. "Canada," who took part in the trial.

## The Instanter Vulcaniser.

WE have received a sample of the Instanter vulcaniser from Morris, Russell and Co., Ltd., 75, Curtain Road, E.C. It is claimed that a tyre repair can be effected by its aid in ten minutes.

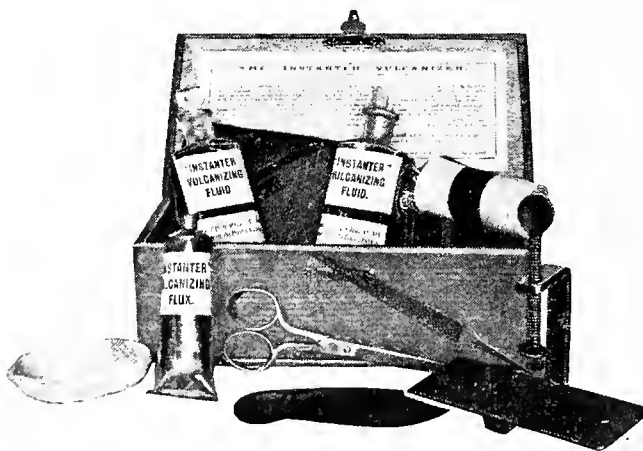
To repair a cut or puncture the tube is first of all nipped together with the fingers exposing the cut or puncture. The edges are then cut with the scissors, which makes the hole a little larger, and leaves the edges ready for repairing. Next the tube is rasped round the hole, as in the case of vulcanising by the hot process; the cut is bevelled, so as to form an extended V. This ensures the plastic rubber

entirely filling the hole. The part to be repaired is then well dressed with vulcanising flux, which is contained in the lead tube. When practically dry the

following procedure is followed: A piece of the plastic rubber, rather larger than the size of the cut or hole, is cut off, then a second piece a little larger still. These are placed in the china dish, and on them is poured a small quantity of vulcanising fluid, just sufficient to cover the plastic rubber, and here it should be allowed to remain not longer than eight or ten seconds.

The plastic rubber is then removed from the dish, and when the moisture has evaporated the smaller piece is pushed into the hole, and immediately the larger piece is placed over it. The tube is next put into the small press, and should be well screwed down. After about five minutes it may be removed from the press, and after the tube has been exposed to the air for a few minutes it has been permanently repaired. The repair should not be trimmed for at least six hours, but this is only necessary for appearance sake.

The same method can be employed for repairing a cut in an outer cover. In this case it is as well to allow ample time for the repair to set firmly. The whole outfit is contained in a neat and well made wooden box.



The Instanter vulcanising outfit, the method of operation of which is described on this page.

# "THE MOTOR CYCLE" RECRUITING SECTION.

Central Office for Motor Machine Gun Service :

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

**N**EARLY a hundred recruits were enrolled in the ranks of the Heavy Section, Machine Gun Corps, last week, the men in every case being experienced car drivers or motor cyclists. The larger number presented themselves at Coventry on Tuesday, but there was quite a good number of candidates at Nottingham on Wednesday. After Tuesday's inspection the men were billeted in Coventry that evening, and proceeded to the training centre next morning.

We think it well to repeat, in view of the large number of applications which are being received, that men may only enlist for immediate service, and that letters need not be written at all, provided the particulars on this page are noted and applicants attend one or other of the inspections arranged.

## This and Next Week's Arrangements.

This week Mr. Geoffrey Smith, Editor *The Motor Cycle*, attended at Coventry Recruiting Office on Tuesday, the 9th inst., and will be at 20, Tudor Street, London, E.C., on Saturday afternoon next, the 13th inst., between 1.30 and 4.30 p.m.

Next week's arrangements are as follow :

COVENTRY.—Recruiting Office, Little Park Street, Tuesday, May 16th, 11 a.m. to 4.30 p.m.

MANCHESTER.—Iliffe and Sons Ltd., Century Buildings, 199, Deansgate, May 17th, 2 to 4 p.m.

The following are the particulars of enlistment in the Heavy Section, Machine Gun Corps :

Applicants must be experienced car drivers or motor cyclists, able to execute ordinary running repairs.

Pay, 1s. 2½d. per day, all found.

Enlistment for duration of war.

Usual separation or dependants' allowance.

Age limits, 19 to 40.

Applicants must be fit for General Service abroad, or for Garrison Duty abroad.

## Last Week's Recruits.

Ainsley, F. W., Durham.  
Angleleri, A., Hereford.  
Arnold, T. A., Newark.  
Baines, W. S. S., Broomhill.  
Baker, E. W., Dudley.  
Barber, D., Downham Market.  
Barnard, E. A., King's Lynn.  
Bell, D. J. R., Alyth.  
Berney, M., Portsmouth.  
Bladon, F., Cannock.  
Bocock, W. E., Collingham.  
Broad, L. S., Cardiff.  
Brown, L., Tunstall.  
Burford, W., Henley-on-Thames.  
Byford, D., Leicester.  
Cade, A., Stamford.  
Cadman, F. L., Hay.  
Callow, H. A., Coventry.  
Capps, F., Downham Market.  
Carrington, B., Nottingham.  
Clutterbuck, F. J. O., Berkeley.  
Crawshaw, S., Cowder.  
Crouch, W., Sutton St. Edmunds.  
Cumberland, H. L., Cliptone.  
Davis, G. T., Llanbyther.  
Dawson, E., Burnley.  
Dyson, H., Hipperholme.  
Evertson, F. C., Droithwich.  
Fowles, F., Forest Gate.  
Francombe, R. F., Plymouth.  
Gormley, A. J. C., Edghaston.  
Greatrex, G., Walsall.  
Halsted, G., Ryde, I.O.W.  
Hamsford, J. S. H., Maidenhead.  
Hargreaves, H. A., Birmingham.  
Harmer, R. H., Hucclecote.  
Harris, T. F., Shrewsbury.  
Haye, H., Sutton-in-Ashfield.  
Hengham, A., Derby.  
Herbert, A. J., Wisbech.  
Hildige, A., St. Helens.  
Holmes, A. W., Nottingham.  
Hopkinson, J. L., Retford.  
Hutchinson, R. L., Leeds.

Johnson, G. C., Sheffield.  
Jones, M., Sutton-in-Ashfield.  
Joyce, C., Fletching.  
Kirk, E. A., Hammersmith.  
Kirk, H. W., Hammersmith.  
Knott, G. L. B., Lincoln.  
Lamond, A. McG., Dundee.  
Leaver, A. H., Bristol.  
Lodge, E. B., Dewsbury.  
Mallin, A., Tipton.  
M'Dowall, J., Ayr.  
Martin, P. W. H., Market Harboro'.  
Mason, R., Dalton-in-Furness.  
Mason, R. E., Dewsbury.  
Moore, S., Chester.  
Neil, J. H., Catford.  
Nicholls, G. F., Coventry.  
North, A., Cambridge.  
Oshorne, D., London.  
Phillipotts, H. P., Leintwardine.  
Pipier, L. H., Poole.  
Ponder, B., East Harling.  
Powell, G., Abergavenny.  
Redshaw, V., Hull.  
Rees, T. J., Abercarnaid.  
Robinson, A., Preston.  
Shaw, T., Burnley.  
Sidwell, G., Coventry.  
Smith, E. J., Brecon.  
Smith, W., Thurston.  
Stedman, B. J., Stamford.  
Stratton, J. N., Redditch.  
Such, T., Redditch.  
Tassell, E. W., Bedford Park.  
Wadman, A., London.  
Wain, J. W., Bradford.  
Wallace, N., Newcastle-on-Tyne.  
Warner, A. F., Wolverhampton.  
Watts, D. B., Swansea.  
Wharton, A., Grimshy.  
Wilberforce, W. A., Knutsford.  
Williams, A., Cambridge.  
Williams, W., Rhos-on-Sea.  
Wilson, J. A., Crewe.



A fine batch of recruits, accepted by the Editor at Coventry on Tuesday of last week, for the Motor Machine Gun Service



## TIME TO LIGHT LAMPS.

GREENWICH TIME.

May 11th	...	8.5 p.m.
" 13th	...	8.9 "
" 15th	...	8.12 "
" 17th	...	8.15 "

### Enterprise.

We know one young and enterprising designer, in whose running shed one may see a different make of machine almost every week, and here's luck to him!

### Spring Frames and Rough Roads.

The road surfaces are getting worse and worse, and no improvement is to be expected till the war is over. Riding a spring frame Powerplus Indian over the week-end, we were fully able to appreciate its merits, and we have a spring frame mount on order.

### A New "Extravagance" Poster.

The latest effort by the National War Savings Committee begins as follows: "ARE YOU HELPING THE GERMANS? You ARE helping the Germans when you use a motor car for pleasure." We are happy to see that motor cycles are not included. It is almost too much to expect that this committee regards motor cycling as an economical method of travelling, but it certainly looks like it.

### A One-armed Motor Cyclist.

A rider, who is minus his right arm, was seen riding a Douglas in Coventry one day last week. Though the roads were greasy and the traffic heavy, he seemed quite happy, and had the machine apparently under excellent control. A foot-operated bell on the right side foot-board was used as a warning instrument.

### The Mono-wheel.

It has been stated in print that the secretary of the Auto Cycle Union in suggesting a wheel tax has omitted to consider the Auto-wheel, which, having three wheels, would be liable to a tax of £3 3s. We have never before been aware that an Auto-wheel had more than one wheel, nor were we aware that a tax could be demanded for a pedal cycle.

### Motor Cyclist Specials Wanted.

We are requested to state that vacancies exist for motor cyclists in the Metropolitan Special Constabulary, Transport Department. Men interested must be ineligible for the Army or Navy, and application should be made to Room 581, Scotland House, Embankment, Westminster. The service is entirely voluntary, but a small allowance is granted towards running expenses.

## SPECIAL FEATURES

THE FIRST THOUSAND. THE 6 H.P. P. AND M. ON THE ROAD.  
IRISH EASTER MONDAY TRIAL.

### Silence.

Some motor cycles are still far too noisy. Many of the heavy sidecar combinations, which have plenty of room for a spacious silencer, are inadequately equipped in this respect, and the police seem keener on speed than silence, in the London area at any rate.

### The Further Restriction of Imports.

An additional list of prohibited imports has been officially announced, which includes rubber tyres and tubes for motor-cars and motor cycles.

### The Portsmouth and Southampton Roads.

The Portsmouth Road as far as Guildford is in a condition which may be described as fair to good. The Hog's Back, towards Farnham especially, is very rough, but steam rollers are at work on it at two places. The repairs are being carried out with Tarmac. There is plenty of tar about just now, and, as usual, the top dressing being meagre, it flies up all over the machine. The police trap from the cemetery to the horse trough in Kingston Vale was busy on Saturday last. It was amusing to see the uniformed man trying to flatten himself out against a doorway.

### A Transvaal Race.

We are informed that a road race from Volkhurst to Vakkerstroom and back, a distance of thirty-six miles, was won by a rider mounted on a 1913 model 3½ h.p. Rudge. The roads were in a very bad state owing to heavy rains, and most competitors suffered from slipping belts.

### Artist and Motor Cyclist.

One of the most favourably criticised pictures now being shown at the Goupil Gallery, 5, Regent Street, in aid of the Star and Garter Building Fund, is one, by Mr. Eric Kennington entitled "Kensingtons at Laventie." Mr. Eric Kennington's work will not be unknown to our early readers, as he ably illustrated a series of stories which appeared in *The Motor Cycle* in 1905. His favourite means of locomotion is an Auto-wheel, and it is interesting to note that he served at the Front with the regiment the incident concerning which his brush records. His father is a well-known artist, and his brother a clever electrical engineer, a keen motor cyclist, and now one of the leading technical experts with the Remy Electrical Co., the American motor cycle lighting and ignition specialists.



ROAD RACING IN SPAIN.

R. Escala (6 h.p. Enfield sidecar), winner of the sidecar class in the Carrera Cup trial, held in the neighbourhood of Barcelona over a distance of seventy miles one day last month. Second and third places were secured by Motosacoche and Indian riders respectively.

**Daylight Saving.**

Daylight Saving, which is to come into force on Sunday, the 21st, will be welcomed heartily by all road users, especially in these days of lighting restrictions.

**Troops on the Road at Night.**

Several regrettable accidents have occurred, since the commencement of the war, through vehicles running into troops on the march at night. We understand that the Army Council has recently issued instructions to the effect that troops marching along roads at night will invariably be preceded by an advanced party carrying a white light, and followed by a rear party carrying a red light.

**The Trial in the Peak District.**

We have been asked to state that the Sheffield and Hallamshire M.C.C. had no connection with the above trial, which was held on Easter Monday, and we are further informed that, while the trial was advertised as an "open competition," no permit had, in fact, been obtained from the A.C.U., which made it impossible for many well-known riders of the Sheffield district to compete, even if they had wished to do so. The account published by *The Motor Cycle* made it quite clear that the trial was privately organised.

**Imports and Exports.**

A further decrease in the numbers of motor cycles imported is to be noted, though the value of parts has gone up considerably according to the latest Board of Trade returns, which are for the month of April. Exports, we are sorry to note, show a considerable drop both as compared with the previous month and the same month of last year. However, it is to be hoped that this is only temporary. The returns as applied to the whole trade of the country are satisfactory, in that exports show a very appreciable increase and imports a small increase.

The actual figures for motor cycles are :

**IMPORTS.**

	April, 1916.	March, 1916.	April, 1915.
Number .....	349	378	476
Value, complete machines	£14,279	£4,209	£25,619
Value, tyres and parts ..	£17,810	£10,321	£13,535

**EXPORTS.**

	April, 1916.	March, 1916.	April, 1915.
Number .....	626	1,093	942
Value, complete machines	£29,487	£49,305	£40,298
Value, tyres and parts ..	£24,105	£30,613	£31,074

**Motorists and Taxation.**

The A.A. and M.U. has received a great number of protests against the proposed new taxes from motorists resident in all parts of the United Kingdom. In the main these protests emanate from the professional and business classes, such as surveyors, doctors, clergymen, farmers, commercial travellers, veterinary surgeons, etc., and it is clear that if the present proposals are passed into law they will operate harshly against men of moderate means and the owners of cars used for utilitarian purposes. The A.A. and M.U. has already approached the Chancellor of the Exchequer, and recommended (a) reduction of the tax on the 16-26 h.p. class, (b) relief for old cars, (c) abatement or exemption where cars are used for public work, and (d) modification of the proposed taxes on motor

cycles and the rejection of the horsepower basis for this class of vehicle. The proposed abrogation of the licences already issued is also being carefully considered by the Association. These licences indicate that, having paid the amount stated, the person in question is entitled to use his car or motor cycle up to December 31st, 1916, without further payment. It is clear that many motorists only paid this duty on the assumption that the terms of the licence would be adhered to by the Government, and that by such payment they were guaranteed the use of their cars for the whole year without further duty being imposed.

**Racing in the Argentine.**

A 100 kilometre race for the Argentine Championship was run off at Buenos Ayres some few weeks ago. The course was a flat, oval, dirt track, of which sixty-one laps were required to make up the 100 kilometres. First place was secured by the rider of a four-cylinder Henderson (time 73m. 16s.); second and third places were taken by Indian riders.

**Twist-handle Controls.**

Those who drive all kinds of machines are in a better position to judge as to the best methods of control than the designer who drives his own machines only. Changing as we do from British to American and American to British, we cannot speak too highly of the Bowden lever, which is less tiring to operate, and it is easy to see whether it is shut or open. Last autumn we rode an American four-cylinder fitted with Bowden levers, and the result was splendid. When they are allowed to import again, American makers should pay more attention to British tastes.

**Easy Starting.**

We referred recently to the number of queries we were receiving on the subject of difficult starting. We find just the same trouble ourselves on machines which come our way for trial, and makers might well give this matter more careful attention. So far the easiest machine to start which we have yet come across is the vibrationless and ever handy Douglas. In fact, all horizontally-opposed twins are notoriously easy starters.

**Another Wounded Soldiers' Outing.**

It is proposed to hold another outing for wounded soldiers similar to that which was so successfully carried out in February last. All riders of Harley-Davidson motor bicycles are asked to co-operate. It is proposed to pick up the men from St. Thomas's Hospital at noon on Saturday, May 20th, and to take them down to a destination which will be announced later, where they will be entertained by artists in a similar manner to the last occasion, which was so successful and so heartily appreciated.

**A Munition Workers' Paperchase.**

Messrs. Burney and Blackburne recently organised a pedal cycle paper chase for their employees, which was a great success. In the event motor cycles played quite a conspicuous part, several of the directors being mounted on Blackburnes, while the trail was laid by that well-known competition rider, J. S. Holroyd, who, at the termination of the proceedings, won a 500 yards scratch cycle race. Our older readers will remember how much pedalling practice he used to get when he rode the old-time lightweights.



TYPICAL FRENCH DESPATCH RIDERS AND THEIR MOUNTS.

From left to right : Auschitzky (Clément), Lamanry (Triumph), and Delavière (Rover). The steel helmets and the generally smart appearance presented by the men will be noted. M. Auschitzky, whom we have to thank for the photograph speaks very highly of the running of the machines illustrated.



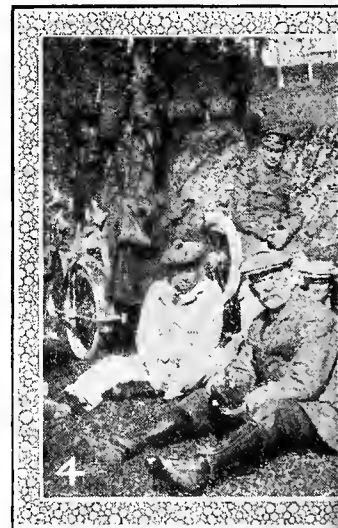
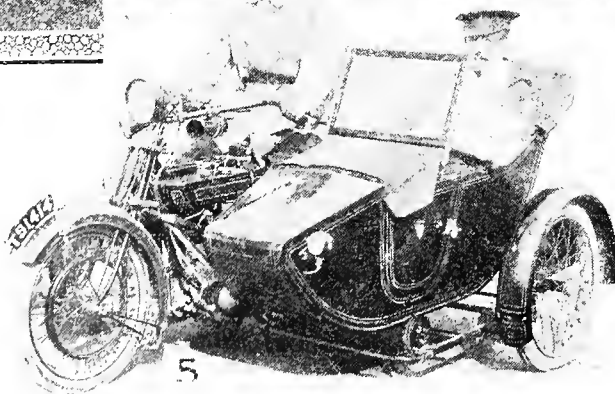
## WOUNDED SOLDIERS' OUTING IN SCOTLAND:

**M**EMBERS of the Dundee Motor Cycle Club are to be congratulated upon the success attending the outing they arranged for wounded soldiers early last week. The principal factors that made it so successful were the fine weather, the excellent response of owners of sidecar outfits, and the energy displayed by Messrs. Myles and David Mann in the arranging of the programme.

Sixty-two wounded men were picked up at midday at the Eastern War Hospital, Dundee. The route followed was *via* Birkhill and Coupar Angus to the wooded hills of Binham and Dunkeld. At the latter place the Scottish Horse had placed a suitable field at the disposal of the club, and here tea and a smoke were enjoyed before resuming the homeward run.



1. General view of the tea



2. The organiser's party. 3. Some of the guests enjoying a sun bath. 4. After tea. 5. Mr. I.

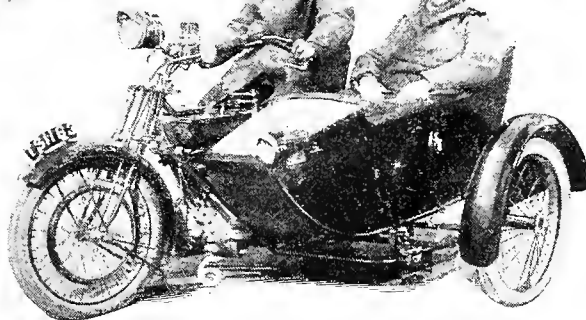
## SIXTY-TWO HEROES IN SIDECARS.

It is hardly necessary to add that the soldiers enjoyed the outing immensely, and already plans, we are informed, are in preparation for a second trip in the near future.

Quite a feature of the outing was the interest displayed by the riders in the large fleet of sidecar outfits that were seen to best advantage at the tea stop. Naturally with sixty-two machines together it was a good opportunity for inspection and comparison, and the delight of the owners of the newer machines was interesting to see. Most of the well-known makes were represented, Enfields and A.J.S.'s being in the majority. The only lady rider was mounted on an 8 h.p. Enfield. There was only one cycle car—the Humberette that occupies a prominent position in the centre photograph.



the number of sidecars will be noted.



camera and a smoke.

ann, organiser of the event, takes a soldier in his sidecar, likewise Mr. Myles (No. 6).

## ENCLOSED OR OPEN CHAINS.

### The Pros and Cons of the Two Systems.

**T**HOUGH most experienced riders are strongly in favour of the enclosed chain drive, there is no doubt that a good deal still remains to be said in favour of the open drive from countershaft to rear wheel. In order to warrant its existence a chain case needs to be made on very substantial lines, with as few overlapping joints as possible, and it should consist, as far as possible, of solid aluminium castings with good wide joints and ample provision in the way of anchorage.

There is no question that the properly enclosed chain drive is ideal, and its one "fault" lies with the motor cycling public, not with the system itself. With this system a broken chain is a very rare occurrence; one will probably ride two or three seasons without experiencing such a thing, but if, finally, it does occur, the open chain advocate at once points an enthusiastic finger and exclaims, "I told you so!"—A single instance of a broken chain and a damaged gear case is sufficient to prejudice the motor cycling community of a given locality for at least a year, and therefore if disaster of this kind can be rendered less likely by the use of specially heavy chains, then this extra strength is certainly a property to be desired.

Personally, I have experienced no transmission troubles of any kind in 15,000 miles riding with enclosed chain drive, but this is probably because I occasionally look inside the chain case. It is quite conceivable that a large number of riders, using machines of this description, are likely to forget all about their transmission system for months on end, and in such cases of neglect the time may come when one of the chains develops a weakness and finally breaks, with the usual sad results.

#### Periodical Inspection.

Many manufacturers have adopted the enclosed chain drive for one or another of their models, but riders must not imagine that, because the chains are enclosed, it is approaching a criminal offence to look inside. The chains should be carefully inspected every 3,000 miles after the initial slack has been taken

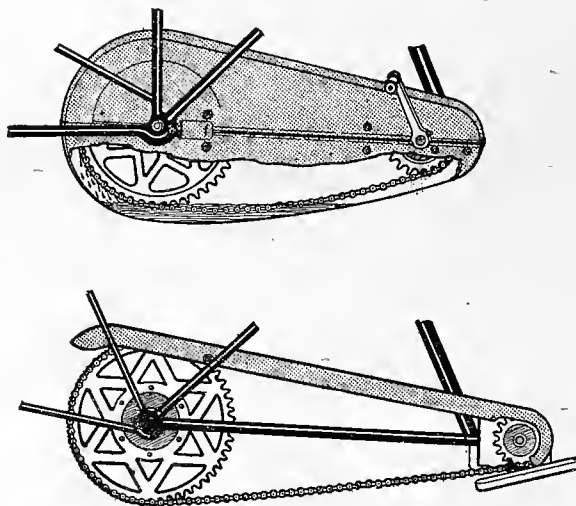
up, and the inside of the chain cases should be cleaned out if necessary. If this is done, nothing cheaper and better than the enclosed chain drive can be arrived at, but large inspection ports are certainly necessary.

If chains are not totally enclosed, they must either be kept in good condition or renewed periodically. The chain case, however desirable it may be, can only be regarded as an extra fitment which is susceptible to damage, and the rider who is willing to keep his chains in good condition will probably find no cause for complaint against the open rear chain. The business of looking after it is its most objectionable feature, and a great many riders make the mistake of keeping their

chains covered with oil or grease. The "wet" dressing simply accumulates grit, which destroys the wearing qualities of the chain. Open chains should be kept well lubricated but as dry as possible. This is easily effected by boiling the chain periodically in really stiff grease, containing plenty of graphite, and by allowing all the superficial grease to drain off before the chain is restored. It is quite a fallacy that any harm can be done to the material of a chain by boiling it; the tempering temperature of metal is so high that any kind of lubricant would vaporise and burn long before it was reached.

For colonial use the open rear chain is unquestionably the thing. Chain cases are apt to become damaged on the extremely rough roads that exist in most pioneer lands. The engine and the transmission need to be well up, and there should be nothing about the lower portion of the machine that can interfere with the drive by becoming dented or damaged. Even the cases from the engine sprocket to the countershaft should be well up and out of harm's way. In British Columbia I often rode with a priest, who used a British-made motor cycle, and the countershaft chain case was the cause of so much trouble that finally we committed it to a watery grave.

Moreover, the extreme strains to which the transmission of a machine is often subjected in the Colonies makes one nervous as to the welfare of the chains unless they are visible and instantly accessible. H.M.B.



Examples of enclosed and open chain drives.

## MOTORING IN BRAZIL.

WE have been glancing through copies of *Auto-Propulsao* of Rio de Janeiro, and it is good to know that Brazilian automobilism in all its branches is nourished by a real live technical paper. *Auto-Propulsao* covers motoring, motor cycling, aviation, and motor boating, and though it has only been in existence a little over twelve months, it is making good headway.

In suggesting an exchange with *The Motor Cycle*, the editor of our contemporary writes: "There is not doubt that you is not going to get a great profit with the exchange of your authoritative big magazine, with our modest publication, as a child having nothing good to offer his father."

The Metropolitan Machinists' Co. make a feature of Watsonian sidecars, which they have in all weights from 47 lb. upwards, suitable for lightweight motor bicycles. They also sell twelve different patterns of motor cycle handle-bars to suit all tastes, and give special attention to providing hoods and windscreens for sidecars.

It is interesting to have to record that the Metropolitan Machinists' Co. is one of the few firms which supply petrol in the City of London.

### Average Prices OF Second-hand Machines.

WE give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted, otherwise the last average is given, if within five weeks.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.B.C.	1915	3½ 4-speed	—	£63
A.J.S.	1915	6 3-sp. sidecar	—	£92
"	1914	6 3-sp. sidecar	—	£56
"	1915	2½ 3-speed	—	£47
"	1915	2½ 3-speed T.T.	—	£50
"	1914	2½ 2-speed	—	£38
Allon	1915	2½ 2-stroke	—	£34
Bat	1915	8 3-sp. sidecar	—	£70
"	1913	6 2-sp. sidecar	—	£32
Blackburne	1915	3½ 3-speed	—	£53
Bradbury	1914	6 3-sp. sidecar	—	£59
B.S.A.	1915	4½ 3-sp. sidecar	—	£60
"	1915	4½ 3-speed	—	£47
"	1914	4½ 3-sp. sidecar	—	£51
Calthorpe	1915	2½ 2-speed	—	£27
"	1914	2½ 2-speed	—	£15
Campion	1915	6 sidecar	—	£51
"	1915	2½ 2-stroke	—	£21
Clyno	1914	6 3-sp. sidecar	—	£51
"	1913	6 3-sp. sidecar	—	£33
Douglas	1915	2½ 3-speed	—	£45
"	1915	2½ 2-speed	—	£40
"	1915	2½ T.T.	—	£48
"	1915	4 3-sp. sidecar	—	£64
"	1914	2½ 2-speed	—	£37
"	1914	2½ 2-speed T.T.	—	£30
"	1913	2½ 2-speed	—	£30
"	1913	2½ 2-speed T.T.	—	£30
Cov. Eagle	1915	2½ 2-stroke	—	£25

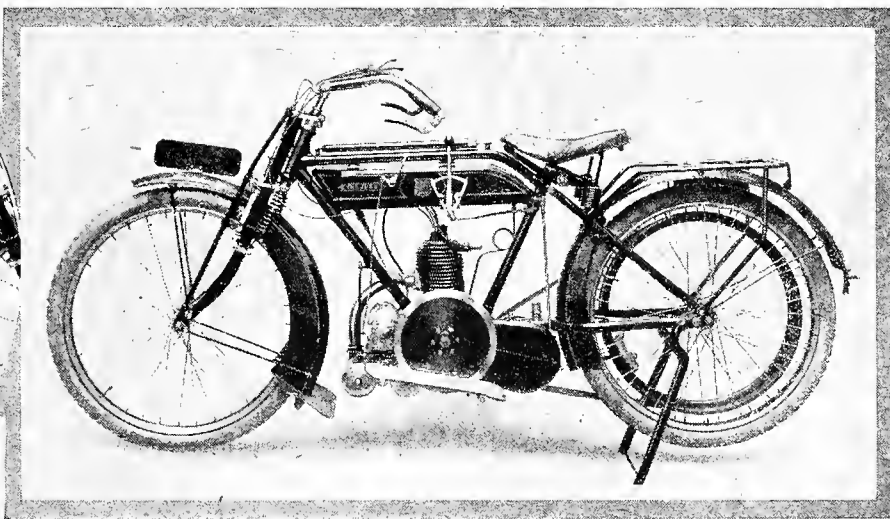
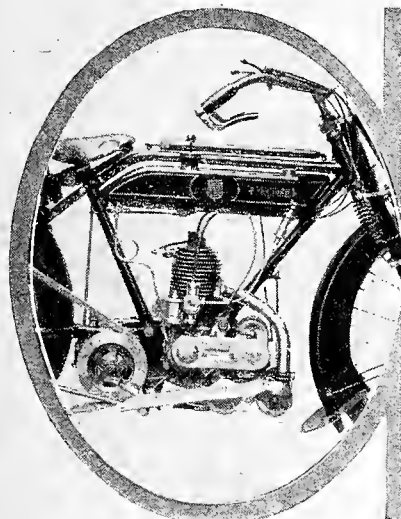
Make.	Year.	H.P.	Average for last week.	Latest average obtainable
Enfield	1916	6 2-sp. sidecar	—	£87
"	1915	8 2-sp. sidecar	—	£74
"	1915	6 2-sp. sidecar	—	£74
"	1914	6 2-sp. sidecar	—	£59
"	1913	6 2-sp. sidecar	—	£47
"	1915	3 2-speed	—	£41
"	1914	3 2-speed	—	£35
Excelsior (A)	1915	7 3-speed	—	£50
H.-Davidson	1915	8 3-sp. sidecar	—	£69
Henderson	1913	4-cylinder	—	£29
Hobart	1915	2½ 2-stroke	—	£30
Humber	1914	2½ 3-speed	—	£26
"	1913	3½ 2-sp. sidecar	—	£26
Indian	1915	7 3-sp. sidecar	—	£75
"	1915	7 T.T.	—	£48
"	1915	5 3-speed	—	£55
"	1915	5 3-sp. sidecar	—	£62
"	1915	3½ 3-speed	—	£18
"	1914	7 2-sp. sidecar	—	£50
"	1914	7 2-speed	—	£45
"	1914	7 T.T.	—	£34
James	1915	3½ 3-speed	—	£48
"	1915	4½ 3-sp. sidecar	—	£64
"	1914	4½ 3-sp. sidecar	—	£47
Lea-Francis	1914	3½ 3-speed	—	£48
Lewis	1915	Popular	—	£24
Matchless	1915	8 3-sp. sidecar	—	£63
"	1914	8 3-sp. sidecar	—	£71
"	1913	8 3-sp. sidecar	—	£50
"	1913	6 2-sp. sidecar	—	£43
Motosacoche	1913	2½ multi gear	—	£14
New Hudson	1915	2½ 2-speed	—	£28
"	1912	2½ 3-speed	—	£19
New Imperial	1915	2½ 2-speed	—	£26
Norton	1915	3 T.T.	—	£46
New Ryder	1915	2½ 2-speed	—	£27
O.K.	1915	Junior 2-sp.	—	£22
P. & M.	1915	3½ W.O.	—	£59
"	1914	3½ 2-sp. sidecar	—	£50
"	1913	3½ 2-sp. sidecar	—	£38
Premier	1915	3½ 3-speed	—	£44
"	1914	3½ 3-speed	—	£20
"	1914	3½ 3-sp. sidecar	—	£48
Rex	1913	6 2-sp. sidecar	—	£34
"	1914	6 2-sp. sidecar	—	£49
Rover	1914	3½ 3-sp. sidecar	—	£42
"	1913	3½ 3-speed	—	£38
"	1913	3½ 3-sp. sidecar	—	£35
"	1912	3½	—	£24
Royal Ruby	1915	2½ 2-stroke	—	£24
Rudge	1915	3½ Multi T.T.	—	£52
"	1914	3½ Multi sidecar	—	£44
"	1914	3½ Multi	—	£36
"	1913	3½ Multi	—	£28
"	1913	3½ Multi sidecar	—	£35
Scott	1913	3½ 2-sp. sidecar	—	£38
Sunbeam	1915	3½ 3-speed	—	£60
Triumph	1915	2½ 2-sp. 2-stroke	—	£35
"	1914	4 3-speed	—	£40
"	1914	4 3-sp. sidecar	—	£50
"	1913	3½ 3-speed	—	£34
"	1913	3½ 3-sp. sidecar	—	£48
Tyler	1915	2½ 2-sp. 2-stroke	—	£26
Williamson	1914	8 2-sp. sidecar	—	£68
Wolf	1914	2½	—	£18
Zenith	1913	8 Gradua sidecar	—	£52
"	1914	6 Gradua sidecar	—	£48

## THE 2½ h.p. LIGHTWEIGHT JUNO.

## Two-stroke Villiers Engine. Single and Two-speed Models.

RECENTLY we had an opportunity of inspecting the latest model 2½ h.p. Juno at the premises of the Metropolitan Machinists' Co., 248, Bishopsgate, E.C. Its motive power is a 2½ h.p. Villiers two-stroke engine, and the drive is by the usual combined chain and belt to the back wheel. An Albion two-speed gear box is fitted. Lubrication is effected by means of a Best and Lloyd sight drip feed, from which the oil drips by gravity to the induction pipe. We also noticed another model in which the oil is led direct to the crank case. We were pleased to remark the large size of the filler caps on the tank.

The machine is well equipped, having a separate spark control and Brooks B150 saddle, a good luggage carrier, and also a metal cased toolbag. The same type of machine is sold with single speed. Yet another model Juno is the 6 h.p. J.A.P.-engined twin, with combined chain and belt drive and three-speed countershaft gear; it is especially suitable for sidecar work.



The 2½ h.p. two-stroke two-speed Juno.

The left-hand view is that of the flywheel side of the power unit. (See description above.)





### Paraffin as a Fuel.

Sir,—I have read your correspondence and "Questions and Replies" about running on paraffin. This subject interests me very much, as I am doing a lot of riding on burning paraffin without any petrol added. The Excelsior Co. made me an engine (5.6 h.p. single) with a low compression, and fitted up the machine with a three-jet Binks and tank divided to hold six pints of petrol at the back, one and a quarter gallons of paraffin in the middle, and a quart of oil at the front. I have just completed 1,000 miles, and find that I can get more miles out of paraffin, but not so much power. I am getting some Binks fuel to try, but it has not yet arrived.

If it had not been for paraffin I should have had to put the machine by. It takes very little petrol to get the machine warm, and both taps are near the saddle; it is no bother to switch off to paraffin. Of course, up hills I turn on the petrol. I am running a big coachbuilt sidecar; my passenger and I weigh twenty-two stone. I had the valve caps off the other day, and found all cleaner by far than I expected, and shall not decarbonise for at least another 1,000 miles. I am also using Spots in both spirits.

JOHN S. ROBSON.

### Top Feed Carburetters.

Sir,—This matter seems to be causing some attention, and, as far as I am able to judge, the bottom feed is superior in many respects, and, taken all round, is the more desirable form.

I notice in a letter from Messrs. Brown and Barlow that they are comparing the top feed with the bottom feed with *toggle mechanism*. Toggle mechanism is quite unnecessary and a positive disadvantage in a motor cycle carburetter, whereas float chambers constructed like the Amac and our own are freed from all these complications. It is not necessary to have top feed in order to abolish the objectionable toggle mechanism. A disadvantage of top feed is the screwing on of the lid. Large diameter threads are bad to start, and are constantly getting put in cross-threaded, and when a float chamber has to be cleaned out the petrol pipe has to be disconnected and the lid screwed off, and it is difficult to unscrew one without unscrewing the other, and so on, and the life of the needle comparing the top feed and the bottom without toggle mechanism is identical, and any dirt coming through the top feed has to filter through the petrol, and stands a much better chance of being drawn into the jets, choking them up.

The top feed arrangement was tried in very considerable quantities years ago, and found wanting.

Messrs. Brown and Barlow state that an advantage of the top feed is that, when the carburetter is flooded, the petrol level in the float chamber is not raised, and that the flood is over immediately the tickler is released. I am afraid I cannot follow this at all, as when the float is pushed down by the tickler the needle is also pushed off its seat and the petrol pours in from the top, and consequently the level must be raised.

Nearly the whole of the troubles in connection with flooded carburetters are caused by the lack of a proper filter between the tank and the float chamber, as fluff in the petrol prevents the needle closing on its seat.

C. BINKS, LTD.

## LETTERS to the EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

Sir,—I have read with much interest the various letters which have appeared in your paper from time to time regarding top feed carburetters.

Twelve of the machines under my charge are fitted with this type of carburetter, and we have found them efficient in every way. With regard to wearing qualities, these machines have now been running for twelve months on active service in England, and the total cost of repairs for these twelve carburetters consists of one new float. I think a repair bill of a few shillings for a grand total of over 80,000 miles (chiefly over bad roads) speaks for itself.

We never find trouble when it is necessary to examine interior of float chamber. Union under tank and clip under mixing chamber are unscrewed, and float chamber and jet come away for inspection. What could be easier or quicker?

I have met riders who have suffered from choked carburetters when a small gauze has been fitted in the float chamber lid. In every case I have effected a cure by removing this gauze and fitting a combined filter and tap. (Best and Lloyd) in place of the usual petrol tap.

I have had experience with all types of carburetters, and am of opinion that the top feed will take some beating.

MOTOR CYCLIST SERGEANT.

### Four-cylinder Motor Cycles.

Sir,—It was with great interest that I read Mr. Thompson's letter *re* the four-cylinder F.N. I should be greatly obliged if he could find time to give a more detailed description of the alterations he has made.

I ride a 1913 two-speed four-cylinder F.N. myself, and consider that, with one or two alterations, it would be quite the best proposition of the day for size and weight and power.

Mr. C. H. Vowels, in a letter in your last issue, demands plugs in the centre of the cylinder head, but, according to my experience, it is purely a matter of luck which position suits the plug best.

A single-cylinder 4 h.p. J.A.P. which I had was fitted with plugs over inlet, and also in the place of compression tap. By changing the h.t. wire from the *centre plug* to the one *over the inlet valve* a most marked difference in running was noticed, the engine accelerating as if the throttle had been opened. A similar test with another engine of a different make resulted in no difference of either power or speed.

The chief fault of the F.N. I consider to be the oiling system, which is wasteful, besides putting oil where it is not wanted, causing the valves to stick in the guides when starting from cold.

The mechanical inlet operation would certainly give more power at slow speeds and an easier start from cold, but I consider that well-adjusted automatics will give *almost* equal results, with the advantage of fewer working parts (difficult to oil), and with four points less for air leakage.

I am, nevertheless, interested in Mr. Thompson's statement that he has a four-cylinder F.N. with mechanical inlets of his own design, and would very much like to know exactly how it was carried out.

C. FREEMAN.

### Carbonisation.

Sir,—Many of your readers must have been conscious of a feeling of envy when reading in your paper that some of your correspondents are able to defer the messy operation of decarbonising their cylinders until they have run over 5,000 miles. I am one of those less fortunate ones, who have, so far, found it necessary to decarbonise after each 500 miles. I drive a well-known twin-cylinder combination with

mechanical lubrication, and some experiments I carried out lately seem to throw considerable light on this question of carbonisation, and may be of interest to your readers.

Needless to say, I have tried more than one brand of lubricating oil for air-cooled engines. I used to endeavour to get easy starting by using an oil of medium body, but soon found that such an oil was liable to produce rather more carbon than a heavier oil. After use such an oil drawn off from the crank case was found to be black in colour, very thick when cold, but thin and watery when hot. Its flash point had undergone a drop of 28° from 208° C. (that of the original oil) to 180° C.

It is obvious that the lubricating oil had undergone "cracking" in the cylinder, with deposition of carbon and formation of substances of lower flash point.

Two of the main factors which influence the "cracking" of mineral oils are present to a varying degree in all internal combustion engines, viz., (a) high pressure and (b) high temperature. Both of these factors are variable in motor cycle engines, and any condition which tends to increase them will increase the amount of carbon deposited. For example, the more the throttle is opened (with consequent increase of speed) the greater will be the average internal pressure. Overloading the engine, using too high a gear, and use of too big a jet would all tend to raise the average temperature of the cylinders.

To maintain clean cylinders the following conclusions seem fairly obvious:

1. Do not use too large a jet.
2. Do not use too high a gear.
3. Do not overload a sidecar combination, nor drive at too great a speed.
4. Do not delay changing down on hills.
5. Use as heavy a lubricating oil as is practicable.
6. Provided ignition and timing are in order, do not worry about easy starting.
7. Maintain cylinders as cool as possible.

Condition 3 is stated broadly, as different machines will vary a lot in their capacity for speed, and in what constitutes overloading.

These conclusions suggest that a low compression, efficiently cooled engine should maintain the cleanest cylinders, other conditions being equal.

I should be interested to hear the opinions of others, who have given any thought to the "reasons why" of carbonisation.

THOMAS A. DAVIDSON.

### An Efficiency Formula.

Sir,—With reference to the question of hill-climbing formulae, it has occurred to me that the general use of a simple formula which would enable any rider to test the efficiency of his engine would be of some service to motor cyclists.

In competition work the time element is an important item in deciding the winner, but the average tourist, so long as he can climb a hill with certainty, does not attach much importance to m.p.h.—in fact, generally prefers to climb at a moderate pace.

Leaving out, then, the time taken, the factors to be taken into consideration are: Capacity of cylinders, total weight, gear ratio, and gradient. The efficiency will be:

$$\frac{\text{Capacity} \times \text{gear ratio} \times \text{gradient}}{\text{Weight}}$$

For example, a 1,000 c.c. engine geared 6 to 1 may be found to pull a total weight of 800 lb. up a gradient of 1 in 8. In this instance the efficiency is:

$$\frac{1,000 \times 6 \times 8}{800} \text{ i.e., } 60.$$

Should the owner be dissatisfied with this result and tune his machine to surmount a gradient of 1 in 6, he will have increased the efficiency to 45 and will be correspondingly gratified.

This method of determining the efficiency of an engine would enable a comparison to be made of different machines without bringing them into actual competition, and the test can be carried out on any hill the gradient of which is known.

It would be a distinct advantage to the seller of a second-hand machine to be able to guarantee a good efficiency rating.

A reversal of the formula will be very useful in enabling the prospective tourist to form a fairly exact estimate of

how his machine will behave under hitherto untried conditions. The gradient climbable will be:

$$\frac{\text{Weight in pounds} \times \text{ascertained efficiency}}{\text{Capacity in c.c.} \times \text{gear ratio.}}$$

Say a 900 c.c. twin, total weight 600 lb., with an efficiency of 50. This will climb a gradient of:

$$\frac{600 \times 50}{900 \times 6} = 5\frac{5}{6}$$

or, roughly, 1 in 6. If the contour book shows that steeper inclines will be met with, gear will have to be lowered or weight discarded.

As a general rule, when the actual efficiency has not been ascertained, it may be assumed that a machine in good tune will climb a gradient of

$$\frac{W \times 50}{\text{One in } \frac{\text{Capacity} \times \text{gear ratio}}{50}}$$

This should be of use to intending tourists.

R. H. CHURLEY.

### Motor Cycle Taxation.

Sir.—It would be ungracious for any motorist to allow *The Motor Cycle's* efforts in regard to the proposed tax to pass unheeded. Thousands of us gave up pleasure motor cycling, when called upon, that petrol might be saved. We used our machines for business or professional purposes only. Then the tax was doubled. The answer many must give is the abandonment of a useful servant, and consequent loss of petrol tax as well as machine tax. The editor has proposed a reasonable solution, and I hope it will be adopted.

A.B., 23.

Sir,—Regarding the proposed extra tax on motors, I am writing you as a lady sidecarist to whom motoring means not only pleasure but renewed health and vigour. I want to offer a suggestion. It may not be new, or feasible, but at any rate the mere fact of writing it may relieve my feelings, which are more than hot, on the matter. Could not a list be compiled showing the sum total of motors which will have to be given up if the tax comes into force, and which will also give the amount of money the Government will lose by imposing the tax? I would gladly send not only my own name, but all the names of persons in this district so affected. Is it not rather mean to get our hard-earned guinea for the year before letting us know we should be taxed to this proposed outrageous extent? If we have to give up the motor (and there seems nothing else for it), we lose nearly four months' pleasure out of the twelve months paid for (we usually motor through the winter). Having myself a tendency to consumption, I am obliged to avoid all pleasure that means contaminated or vitiated atmosphere of any kind. Since I have been out in the fresh air I have found great improvement in my health, both physical and mental. If the motor goes I shall have to keep to the house altogether, as I cannot walk far without exhaustion. I manage to do all my own housework, bake my own bread and economise, and stint myself in clothes so as to be able to afford the motor at all, and it "goes against the grain" to have to give it up. Our income has gone down owing to the war, and the cost of living has gone up by leaps and bounds since we got our beautiful new 6 h.p. Enfield last August.

I cannot help thinking that if motorists would band together and get the matter properly represented at "head-quarters," something might be done. Why is there no tax on ordinary cycles? One-third of our local mechanic's time is taken up with repairs to ordinary push-cycles, and most of the riders could pay at least a small tax. This surely would lessen somewhat the need for such drastic treatment of motorists.

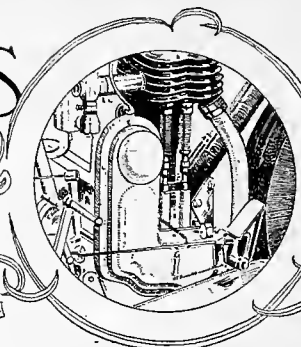
I was trying to muster up courage to tackle driving the machine myself, as my husband can only take me out on Wednesday afternoons and Sundays, but I hardly think it worth while to begin now. We shall either have to sell the machine at a great loss, or else garage it till better days come. We cannot possibly find the extra tax.

We have taken your paper now for over two years, and I always read everything (except the purely technical parts) with great interest.

Apologising for this lengthy effusion,

ETHEL M. WILLOUGHBY.

# QUESTIONS AND REPLIES



## Gear for Sidecarring.

**?** (1.) What is the proper gear ratio for running my machine with sidecar attached to get the maximum speed with minimum wear and tear on engine? (2.) How do you find the proper gear ratio? (3.) What will be the new tax on my  $3\frac{1}{2}$  h.p. three-speed 1913 Triumph?—D.L.C.

(1.) You should use as high a gear as possible without causing the machine to labour. You will probably find this will be about 5—1. (2.) To find what the gear is you count the number of times the engine revolves to one turn of the rear wheel. (3.) The tax on your machine will be £3 3s.

## † Making a Starting Device.

**?** My  $3\frac{1}{2}$  h.p. Rover sidecar is fitted with an Armstrong Mark III. three-speed hub, and, as you know, I cannot start the engine without putting the machine on the stand. Is it practicable to fit a free wheel on the outer flange of the adjustable pulley, and then reverse the pedalling gear to bring the chain wheel on the same side of the machine? I could get a larger chain wheel if necessary, and bring the gear to, say, fifty-six (or even larger) teeth on the large wheel and sixteen teeth on the free wheel. Perhaps you can make some suggestion, if you do not think the above idea any good. Would you recommend fitting a decompressor to assist in starting—if so, what pattern? I rather like the type which lowers the compression by means of an auxiliary chamber and has no outlet to the air. Do you think I could make the machine start slower by fixing up some arrangement to control the bottom air (B. and B. carburettor, 1912) and then giving less throttle opening? It draws a lot of bottom air, as I seldom have the air lever wider open than the throttle, even when going fast.—W.T.M.

It is quite possible to fix up a starting device such as you suggest, and we have seen it carried out with more or less success several times, but the free wheel is in action the whole time the engine is running, and is, therefore, called upon to perform very heavy work. Owing to the speed of the engine this rapidly wears out, and requires frequent injections of oil to keep it free at all. If you could devise some system incorporating a free wheel which could be disengaged from

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

the engine-shaft after the engine has been started it would be more satisfactory. A decompressor would probably assist you in starting. There are several perfectly satisfactory auxiliary fittings on the market, and we favour the pattern with the double-seated valve. Your carburettor is evidently not adjusted properly. Possibly there is an air leak between the carburettor and engine, or the choke tube may be too large. Either of these may prevent you getting a sufficiently rich mixture for starting easily. Bind all doubtful points between the carburettor and engine with adhesive tape.

## Testing the Compression.

**?** How can I ascertain whether I have good enough compression on a 6 h.p. twin Enfield, as on this machine there are no pedals?—R.W.S.

If the compression will skid the back wheel when pushed along with the valve dropped your compression is sufficiently good for ordinary purposes.

## Engine Choking.

**?** My machine is fitted with a  $2\frac{1}{2}$  h.p. M.A.G. engine, and has a fixed-jet carburettor. Whenever it is necessary to run for any length of time on three-quarters throttle it suddenly misfires and comes to a standstill. Except when starting, the air lever must always be kept open, otherwise the engine misfires. What is the matter with the machine? Is it too large a jet?—H.S.

It certainly does look as if the jet were rather too large. The stoppage might quite well be due to choking, caused by too strong a mixture. Try fitting a smaller jet.

## A Motor Cycle for Business Purposes.

**?** I am thinking of purchasing a motor cycle and sidecar, which I intend to use as a means of conveyance of tools and materials in connection with my business. It will be used by me and my employees, and may sometimes be required to be driven solo on errands. Shall I have to pay any taxation provided my name and address are painted on the sidecar?—W.G.H.

You will not have to pay any local taxation licence provided the box body is always kept on the machine. If you use it for solo purposes the authorities will argue that when the box is detached it is quite possible to use it for pleasure riding; and then you will get no exemption, nor would you if an ordinary passenger body were fitted.

## Converting a Lubricator.

**?** I have connected the auxiliary oil pump of my mount up to my drip feed, as I did not find the latter satisfactory, but now I find I cannot force the oil through with a reasonably strong spring. I might mention that my pump has two valves, so that a tap is not necessary. My machine is a 1913  $2\frac{3}{4}$  h.p. Enfield. Could you tell me the best thing to do? The engine also gets very hot. Is there any cure for it? Everything is in perfect order. Should I advance the magneto timing? How much oil ought I to use? I live in a very hilly district.—H.G.B.

We should think there must be something choking the feed pipe, otherwise there is no reason why the oil should not be forced through the drip feed. Make sure the springs of the ball valves are not too strong. The most usual causes of overheating are insufficiently strong valve springs, too large a jet, stopped-up air supply to carburettor, choked silencer outlet, and ignition insufficiently advanced. Do not alter the ignition timing unless you are sure the engine would stand more advance. About the correct ignition timing would be with the piston on top dead centre the contact points should be just breaking with the ignition fully retarded. The little cardan shaft on this machine which drives the magneto is very apt to wear the base on the magneto spindle, and gradually to retard the ignition, when overheating is almost certain to result.

## PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

**Water in the Carburetter.**

**Q.** Will you kindly tell me what is wrong with my  $3\frac{1}{2}$  h.p. single-cylinder machine? Not having used it since Christmas I got it out and injected a little petrol in the engine, and after a lot of pushing it started and then stopped after going about fifty yards. Several times it did that, and once the silencer caught fire, but happily no damage was done. I was rather puzzled, so I took the carburetter down and cleaned it, and found three drops of water in the bottom. The machine acted just the same after I had put it on again. I might say the magneto is all right, as it was seen to before starting and a little adjustment made. Being rather a novice I hardly know what to do. Would it be advisable to get a new carburetter, as I think mine is a rather old one? I shall be very glad if you can give me a hint or two as to what to do.—E.W.

We think that the trouble is undoubtedly due to water in the carburetter. You may have succeeded in getting out what there was in the carburetter, but there is probably some still left in the tank. It will not mix with the petrol, but remains in globules at the bottom. Sometimes it gets into the petrol pipe, and finally into the carburetter. Water being transparent, if you hold up the jet to the light, even if there is water in it, it looks quite clear. All you can do is to persevere, and carefully clean every part of the petrol system, and we think that the trouble will cease. The reason why the machine runs for fifty yards and then stops is that it runs on the amount of petrol you

inject. The silencer catching fire was probably due to neat petrol being carried into the silencer, and fired by the next charge. A new carburetter seems hardly necessary. You might look to the contact breaker rocker arms, which may be stuck through the damp swelling the fibre bush. This frequently happens after a machine has been laid aside for some time.

**Timing for Touring.**

**Q.** My cycle is a  $3\frac{1}{2}$  h.p. single two-speed (Badcock's by-pass fitted). High gear, variable from about  $4\frac{1}{2}$  to 7 to 1; low from 9 to 14. I use it in very hilly country, with sidecar for a passenger who is unable to walk. So that power on hills is the essential requisite, and speed is not at all of importance. For that purpose (1) what timing of valves and magneto would be most suitable? (2.) If the total weight were 700 lb., what would be the maximum gradient surmountable? (3.) At what stage of wear should the facings of the drum clutches for high and low gear be renewed? I have been troubled sometimes with slip. The thickness now is about  $\frac{1}{16}$  in.—W.P.

(1.) Absolutely standard, viz., arrange exhaust valve to close when piston is on top dead centre; inlet to open immediately after. With sidecar, time spark to take place when piston is on top of the stroke with ignition half retarded. (2.) This depends upon the power developed by your individual engine. (3.) Do not trouble to replace these until clutch slip occurs. If the clutch slips and adjusting does no good, then it will be necessary to have new bands fitted.

**READER'S REPLY.****Refusal to Fire.**

"R.A." has perhaps timed his magneto so that the points open on the wrong segment. I have had that experience with my  $2\frac{3}{4}$  h.p. Douglas; everything seemed correct, but it refused to fire until the h.t. cables were crossed (i.e., each cable led to the opposite plug), then the firing was perfect. The trouble had been that the points had been timed to break on the wrong segment, therefore the spark was occurring on the top of the exhaust strokes instead of on the compression strokes. My h.t. cables are still crossed.—W. HANCOCK.

**RECOMMENDED ROUTES.****DUNSTABLE TO SKEGNESS.—J.S.**

Dunstable, Ampthill, Bedford, Buckden, Stilton, Peterborough, Crowland, Spalding, Boston, Wainfleet, Skegness. 100 miles approximately.

**BISLEY TO BLANDFORD.—D.G.H.**

Bisley, Farnham, Alton, New Alresford, Winchester, Romsey, Cadnam, Ringwood, Wimborne Minster, Blandford.

**PETERBOROUGH TO MAIDENHEAD.—G.H.**

Peterborough, Stilton, Buckden, Bedford, Ampthill, Dunstable, Tring, Amersham, High Wycombe, Great Marlow, Maidenhead.

**DUNSTABLE TO NOTTINGHAM.—J.S.**

Dunstable, Woburn, Newport Pagnell, Northampton, Husbands Bosworth, Leicester, Loughborough, Nottingham. 85 miles approximately.

**BIRMINGHAM TO LLANDUDNO.—J.A.**

Birmingham, Halesowen, Stourbridge, Bridgnorth, Much Wenlock, Shrewsbury, Llangollen, Corwen, Bettws-y-Coed, Llanrwst, Llandudno.

**EXETER TO BRISTOL.—C.F.**

Exeter, Cullompton, Wellington, Taunton, Bridgwater, Highbridge, Cross, Churchill, Bristol.

**LIVERPOOL TO BIRMINGHAM.—A.W.**

Liverpool, Runcorn, Northwich, Holmes Chapel, Newcastle-under-Lyme, Stone, Weston, Rugeley, Lichfield, Sutton Coldfield, Birmingham.

**BLACKPOOL TO RHYL.—J.E.W.**

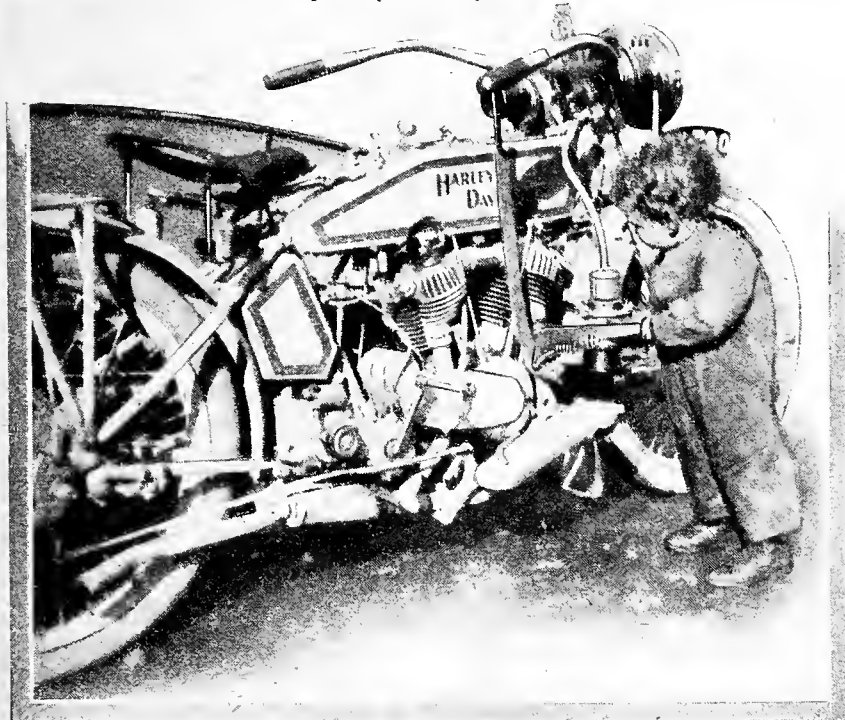
Blackpool, Preston, Ormskirk, Liverpool, ferry to Birkenhead, Queensferry, Flint, Holywell, Rhyl.

**MARKET HARBOUROUGH TO BATH.—W.G.W.**

Market Harborough, Calthorpe, along Watling Street to Daventry, Byfield, Banbury, Chipping Norton, Burford, Cirencester, Malmesbury, Chippenham, Box, Bath.

**NOTTINGHAM TO SKEGNESS.—J.S.**

Nottingham, Bingham, Grantham, Boston, Wainfleet, Skegness. 70 miles approximately.

**DOING HIS BIT!**

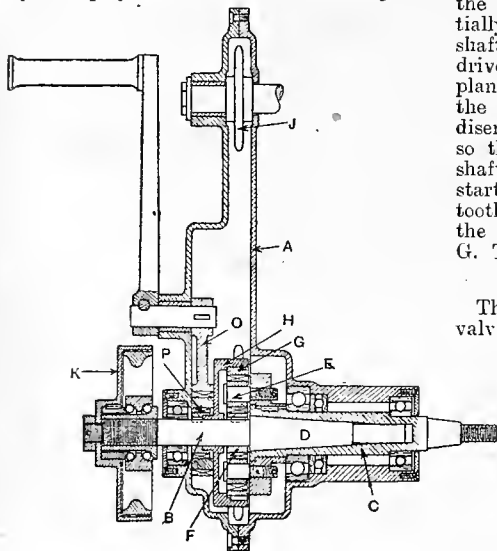
The three-year-old boy of a Sidmouth motor engineer who insists upon helping to carry on the business during his father's absence on war work. With a spanner nearly as large as himself, the little boy is attaching a lever to the brake pedal which he is unable to reach with his foot.



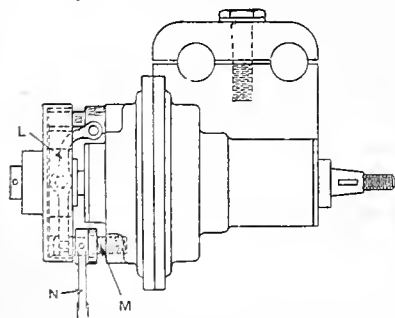


### An Epicyclic Countershaft Gear.

By the mechanism illustrated there is provided a free engine and a two-speed gear, the lower ratio of which is afforded by an epicyclic train. In the casing A



are mounted two co-axial shafts B C. The inner ends of the shafts B C are respectively externally and internally coned as shown at D, and together constitute a conical friction clutch. On the shaft B is fixed a sun pinion F, whilst planet pinions G are mounted on pins carried by the driven shaft C. The internally-toothed ring H, which completes the train, is carried by an annulus J, which carries a chain sprocket, whereby it is driven from the engine sprocket K. The annulus is loosely mounted on the shaft B, the

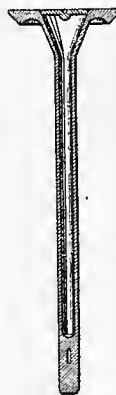


outer end of which also carries a brake drum K, whereby it may be, either released or held against rotation as desired. In order to give effect to the cone clutch D, lateral motion must be imparted to the shaft B, and the mechanism for providing this is shown in the smaller view. It will be seen that the brake actuating mechanism is carried on a pivoted arm L, movement of which is

effected by a screw-threaded rod M, operated by the control lever N. With the parts in the position shown, the clutch D is engaged and the brake band free, so that a direct drive results. By moving the control lever N, the shaft B is partially withdrawn, and the brake band and shaft B held stationary, so that a reduced drive passes to the shaft C through the planet pinions. On further movement of the lever N, the shaft B is completely disengaged and the brake band released, so that no drive is transmitted to the shaft C, the engine running free. A kick-starter is provided in the form of a toothed sector O actuating a pinion P on the shaft B through a one-way clutch.—G. T. Dallison, No. 22,968, 1914.

### A Light Valve.

The importance of lightness in engine valves is not sufficiently recognised by many designers. Considering the high speeds at which motor cycle engines run, particularly for competition purposes, more importance should often be attached to reducing the weight of



these reciprocating parts, the inertia of which frequently becomes the limiting factor to the speed of the engine. As a rule, motor cycle valves are heavier than those on car engines, chiefly, of course, because they require to be made stronger. In this case the required strength is obtained by using a large conical neck between the head and the stem, and this is bored out for the sake of lightness, and the passage closed up at the top by a steel disc. The edges of the hole are spun over this disc, and the joint finally welded, after which the valve is machined all over, so that it has the appearance of a solid valve.—H. Lindley, No. 5,721, 1915.

We are informed that A. Blake, winner of the sidecar class and Wilkin trophy in the Sheffield Easter Monday trial, used a Henderson featherweight sidecar with his 2½ h.p. Levis.

Waverley Cars, Ltd., 115, Great Portland Street, W., have lately taken over the agency for the Edmund spring frame motor cycle, both wholesale and retail, for London and district, and also for the following countries: India, China, Federated Malay States, Ceylon, New Zealand, and Spain. They are in a position to give immediate delivery from stock, and will carry a large supply of spare parts for this machine.



### A Woman Tyre Representative.

The Steptey Tyre Co. is now represented in the South-west of England by Mrs. G. L. Hurrell, whose husband, before joining the Army, occupied the post.

### A Word for a Good Belt.

A reader wishes to place on record the satisfactory service he is getting from a 1½ in. John Bull belt on a 6-7 h.p. Zenith sidecar. The belt, he tells us, has been used for 7,000 miles, and still appears in excellent condition.

### Reviews.

"Cyclist Companies with Divisional Mounted Troops, 1916." Major J. C. Burnett, D.S.O., Chief Instructor Army Cyclist Corps. 1s. W. H. Smith and Son, 186, Strand, W.C. A book which every member of a cyclist battalion will find invaluable to him. What we should like to see is a similar publication for motor cyclists. There is no book which an embryo D.R. may read up before joining the Forces, and such a book is very badly wanted.

### A Good Machine.

There are few machines of which we have a more pleasant recollection than a 3½ h.p. Motosacoche twin, which was one of our mounts in the Isle of Man about two years ago. The silent running, excellent pulling properties, and reliability of this fascinating mount are not likely to be forgotten. Since that time the Motosacoche has greatly improved, and we are informed by the company that they can deliver promptly their 2½ h.p. single and 3½ h.p. and 6 h.p. twin models, while they carry a large stock of spares.

### Catalogues Received.

We have received from New Imperial Cycles, Ltd., Birmingham, a catalogue of the New Imperial Light Tourist model, which is now supplied with a clutch and enclosed kick starter in the case of both ladies' and gentlemen's machines.

We have also received from the same company a booklet entitled "Don't take Risks and Why," by Norman T. Downs, managing director of the company. It consists mainly of a series of press notices and testimonials relating to the New Imperial.

The New Hudson Cycle Co., Ltd., of Parade Mills, Birmingham, have sent us copies of the following booklets that they have just issued:

- "New Hudson Motor Cycles (Lightweights)—Hints to Riders."
- "New Hudson Motor Cycles (Lightweights)—Replacement Parts."
- "New Hudson Motor Cycles (Heavyweights)—Hints to Riders."
- "New Hudson Motor Cycles (Heavyweights)—Replacement Parts."

## MOTOR CYCLES FOR SALE.

## Auto-Wheels.

**AUTO-WHEEL**, 1914, new condition, ready to attach to motor cycle; £7.—P. J. Evans, John Bright St., Birmingham. [X9272]

**AUTO-WHEEL** De Luxe; £15/15, 28/3 monthly; converts any cycle to a motor.—Juno Showrooms, 248, Bishopsgate, London. [5156]

**AUTO-WHEEL** De Luxe, 1915 model, used station work 6 months, good condition; £9/10.—G.E.N., c/o Housekeeper, 222, Strand. [4988]

**AUTO-WHEEL**, fitted to B.S.A., 21in. frame, in good order, also spare new Dunlop cover; £11.—Heath, 1, North Cray Rd., Bexley. [5065]

**WALL** Auto-Wheel for sale, splendid condition, just overhauled by makers (£3); accept £10/10.—C. Street, Southampton St., Ringwood, Hants. [X9050]

**WALL** Auto-Wheel, 1914, latest type, single lever control, little used, cost £14/14, bargain, £8/10.—Murray, 37a, Charles St., Hatton Garden, Holborn. [X9161]

## Arno.

**ARNO** Motor Cycles from £38 to £50; early delivery; deferred terms from one-quarter down, balance by twelve monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before rejoining the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Arno motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Green Taxis, Villiers St. Garage, Charing Cross, London. [4055]

## Bat.

**1913** 8h.p. Bat-Jap and Sidecar, 2-speed countershaft, kick start, lamp, spares.—Smith, 6, Farnham Rd., Coventry. [X9292]

**BAT-J.A.P.** 1915 Combination, 6h.p. twin, Bosch, 2 speeds, countershaft, kick; £36/10.—1, Ebner St., Wandsworth. [X9146]

**1913** 6h.p. Bat-Jap, 2-speed countershaft, B. and B. Pilot, excellent condition; £32/10.—111, Grove Lane, Camberwell. [4949]

**1915** Bat-Jap and sidecar, T.T. handle-bars, speedometer, watch, and all tools, new last November; bargain, £60; 3-speed gate change.—35, Mile End Rd., London, E. [X9068]

**1914** Bat, chain-cum-belt drive, kick starter, 3-speed gear box, B. and K. sidecar, all spares and accessories; £60; any time.—172, Lordship Lane, East Dulwich. Tel.: 1201 Sydenham. [5069]

**BAT**, 1916, 4.5h.p. twin, 2-speed, T.T. sporting model, countershaft gear, brand new, in stock, £55, special price for cash only.—Elke and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

**BAT-J.A.P.** 1915 5.6h.p. Combination, luxuriously sprung, 3-speed countershaft, Lucas fittings, Amal carburettor, fast machine, owner driven; cheap for cash sale.—Whitehouse, Engineer, Great Bridge. [X8294]

**BAT U** Crele, 6h.p., twin cyls., special model No. 2C, 1915 model, painted grey, Bosch ignition, countershaft gear with 3 speeds, complete with Lucas head and tail lamps, tyres 26x2½, spring footboards, Lucas horn, spare box, belts, and nuts, also spare chain parts, tools, pump.—Can be seen at Barkston Motor Co., 244, Earl's Court Rd., London, S.W. Price asked £75. [4874]

## Bown.

**BOWN-VILLIERS**, 1916 (brand new), 2½h.p., mag., 2 speeds, countershaft, very smart; list £38/10, price 29 gns.—Wandsworth Motor Exchange, Ebner St., Wandsworth Town Station. [X9149]

## Bradbury.

**BRADBURY**, 1913, 2 speeds, in good order; £18.—Percy and Co., 337, Euston Rd., London. [5177]

**BRADBURY**, 1912, and new coachbuilt sidecar; trial; £25.—29, St. Leonard's St., Bow, E. [5018]

**BRADBURY**, 4h.p., 2-speed, good condition; £30.—Prew, 3, Watcombe Terrace, Rowhaston, Taunton. [X9236]

**BRADBURY** and Sidecar, 1912-13, 2 speeds, 4h.p., smart turnout; £23.—Speechley, 45, Church Rd., Acton. [X9217a]

**BRADBURY** and Sidecar, splendid condition, everything; £35.—T. Holt, Brownhill Hotel, Heights Lane, Rochdale. [X9097]

**BRADBURY**, 1913, 4h.p., 2 speeds, clutch, chain drive, sidecar, accessories; quick sale £28-672, Commercial Rd., London, E. [X9146]

**BRADBURY**, 3½h.p., N.S.U. 2-speed gear, free engine, Amal carburettor, excellent condition; £20.—15, Woodcote Rd., Wallington, Surrey. [X9007]

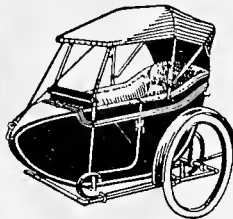
**BRADBURY**, 4h.p., 1912, and wicker sidecar, engine just overhauled, 3-speed, good tyres and spares, £30.—Apply, Pinney, R.A. Mess, Woolwich. [X9072]

**BRADBURY**, 4h.p., practically new Palmer and Dunlop tyres, new piston, very fast, absolutely good condition; any trial; bargain, £25.—Clark, Long Medford, Suffolk. [5029]

**BRADBURY**, 3½h.p., 2 speeds, free engine, cane fold in chassis sidecar, fully equipped spares, and accessories, grand going order; £20, or near offer; must sell.—12, Swain Rd., Thornton Heath. [5163]

## CORONET Sidecar Chassis

Is designed for long life, and has a wonderful reserve of stability, and is safe on greasy roads. Luggage carrier built into frame. Cannot shake loose, and is a boon when touring.



£10 15s.

Send for Illustrated Catalogue describing these well-known Sidecars.

EXCHANGES.

TRADE SUPPLIED.

We can give immediate delivery of all models and suitable for any make of machine.

## SIDECARS FOR HARLEY-DAVIDSONS, EXCELSIORS, and INDIANS.

We make a special Sidecar, enamelled French grey to match, 28 x 3in. tyre, apron to cover entire body, and four-point attachment. . . . . £13 10  
Immediate Delivery.

## 7-9 h.p. HARLEY-DAVIDSON.

11F, electrically equipped, 3 speeds . . . . . £76 13  
11F, standard 3-speed model . . . . . £68 5  
Cash Offers Wanted.

## CASH OFFERS WANTED.

4½ h.p. STAR, big single, brand new 3-sp., chain drive, kick starter; listed £68 5s. . . . . £55 0  
1916 7-9 h.p. HARLEY-DAVIDSON . . . . . £80 15  
1916 ditto, electrical model . . . . . £89 0  
6 h.p. A.J.S., 1915, lamps, horn, speedometer, Sidecar with screen . . . . . £78 0  
7 h.p. INDIAN, 1916, Powerplus, only run 800 miles . . . . . £69 15  
2½ h.p. WOLF, 1916, 2-stroke, 2-speed . . . . . £33 10  
6 h.p. REX de Luxe, 1913, 2-speed model, with 176 Sidecar . . . . . £35 15  
6 h.p. ZENITH, 1911, Zenith gear . . . . . £25 15  
3 h.p. TRIUMPH, 1910 model . . . . . £18 15  
3 h.p. LINCOLN-ELK, 1912 model . . . . . £15 15  
5 h.p. INDIAN, 1915, 3-speed, finished red, beautiful condition . . . . . £57 15  
4 h.p. ZENITH, 1912, variable gear . . . . . £25 0  
1913 HUMBERETTE, 8 h.p., hood, screen, 5 lamps; and speed watch attention . . . . . £39 0  
3 h.p. RUDGE, 1912, free-engine model . . . . . £19 15  
3 h.p. P. & M., 1909, 2-speed, chain drive, with Sidecar . . . . . £19 15  
3 h.p. SINGER, 1912, 3-speed model, with cane Sidecar . . . . . £25 0  
3 h.p. LINCOLN-ELK, 1911, magneto . . . . . £12 15  
3 h.p. TRIUMPH, 1911, 2-speed model, with Sidecar, lamps, and horn . . . . . £23 15  
2½ h.p. PREMIER, 1912, 3-speed model . . . . . £20 15  
1915 MORGAN, 700x80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. . . . . £89 0  
3 h.p. HUMBER, 1911, 2-speed . . . . . £17 15  
3 h.p. P. & M., 1912, kick starter . . . . . £27 15  
3 h.p. PREMIER, 1911, B.S.A., 2-speed . . . . . £19 15  
1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn, and lamps . . . . . £89 15

## MISCELLANEOUS.

New Complete Sidecar Chassis . . . . . £ 2 19 6  
New Coach-built Body, side door . . . . . 2 17 0  
New 1½ Weatherproof Magneto, single . . . . . 3 10 6  
Good Sidecar, complete . . . . . 1 12 6  
1910 Binks Carburettor, Your old carburettor taken in exchange.  
Light Car Chassis, with 6½ h.p. De Dion engine, 2 speeds, good tyres . . . . . £12 15 0  
Speedwell Sidecar Chassis, with 2½in. tyre . . . . . £2 19 6  
New 2½ h.p. Petrol Stationary Engine, mag., 2 flywheels; listed £22 ros. . . . . £15 15 0  
1913 Burbury Coach Sidecar . . . . . £ 6 15 0  
Cane Sidecar, enclosed body . . . . . £ 3 15 0  
New Projectile Cane Sidecar . . . . . £ 8 5 0  
B. & B. Carburettor, h.b. control . . . . . £ 2 6 0  
Wanted to buy Lathe, about 6½in. centres.

BOOTH'S MOTORIES,  
PORTLAND PLACE, SKIRCOAT ROAD,  
HALIFAX.

Phone: 1062.

Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## Bradbury.

**THE** Ideal Combination for hill-climbing. Look at this plum.—3½h.p. Bradbury, 1913, tyres perfect Bosch waterproof, lamps, tools, etc.; any trial with sidecar and new tyre; must sell; £28; first offer or cheque secures.—H. Millard, Chesterfield. [X9176]

## Brown.

**3½** h.p. T.T. Brown, Bosch, B. and B., fast and good; 12 gns.—Troward, Heathurst, Vale of Health, Hampstead. [5112]

**BROWN**, 3½h.p., just overhauled, Bosch, B. and B., good tyres, excellent running order; £15.—Cpl. Pugh, Sutton Lodge, Cookham. [5015]

## B.S.A.

**B.S.A.**, new 1916, both models H and K in stock.—Moss, Wem. [X9256]

**B.S.A.** Model H, in stock, immediate delivery.—Nelson, Gloddaeth St., Llandudno. [X9179]

**COLMORE** Depot, 261, Deansgate, Manchester, for immediate delivery of B.S.A. [0798]

**B.S.A.** Models H and K in stock; immediate delivery.—Colmore Depot, 261, Deansgate, Manchester. [4664]

**B.S.A.**, 4½h.p., 3-speed countershaft, with B.S.A. sidecar; £48.—Clark and Co., Motor Engineers, Doncaster. [4907]

**B.S.A.**, new models. I have a good stock of model H and No. 2 sidecars; no waiting.—Hucklebridge, 133, Sloane St., London, S.W. [X8447]

**B.S.A.**, late 1914, all chain drive, carefully used, ridden solo, lamps, tools, good tyres; a bargain, £45.—Searle, Burnham Market. [4947]

**B.S.A.**, 1915, 4½h.p., with accessories, practically unused; accept £50, or nearest offer.—Chaffeur, Chatsworth House, Bakewell. [4882]

**B.S.A.**, late 1914 4½h.p. combination, 3 speeds, countershaft, in real good order; £45.—Percy and Co., 337, Euston Rd., London. [5175]

**B.S.A.**, 1914½, 4½h.p., countershaft 3-speed, fast and reliable, in excellent condition; 39 gns.—32, Comeragh Rd., West Kensington. [5106]

**B.S.A.**, 1915, 4h.p., chain-cum-belt, 3-speed, complete; accept £45, worth quite £50, cash only.—Layton's Garage, Bicester, Oxon. [X9282]

**B.S.A.'s**, both models actually in stock; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4943]

**1912-13** B.S.A., 2-speed, free, 18 gns. Gloria, accessories, spares, splendid condition, little used, not at all last 9 months.—Letter, 47, Onseley Rd., S.W. [4910]

**B.S.A.**, 4½h.p., 1916 K models, chain-cum-belt, 3-speed, kick starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton, London. [X9251]

**1915** B.S.A., 3-speed countershaft, fully equipped, Dunlops, as new, guaranteed perfect, Phoenix coach sidecar; £56, take lightweight.—A. Coffin, Holwell, Sherborne. [X9062]

**1916** B.S.A., 4½h.p., 3-speed countershaft, new fort-tyre, agent, unspratched perfect, £59.—Lieut. Smith, Leicester R.H.A., No. 2 Hamilton, Lincs, Rolleston, Salisbury. [X9100]

**B.S.A.**, late 1915, 4½h.p., model K, 3 speeds, chain-cum-belt, all accessories, brand new condition, practically unused, complete with Middleton sidecar; £54.—294, Kennington Park Rd., S.E. [X9243]

**B.S.A.**, 1916, 4½h.p., models H and K, £64 and £62; also No. 2 sidecars, £18/18, ex-actual stock; exchanges arranged.—Mauds' Motor Mart, 100 and 136, Gt. Portland St., London, W. Phone: 552 Mavrin. [5124]

**B.S.A.**, 1916, model K, 4h.p., chain-cum-belt, countershaft 3-speed, used once, guaranteed unsoiled and perfect; cost £62, must sell because of serious illness, accept £55; will transfer warranty.—Tollady, Hemingford, Bicester, Oxon. [X9283]

**B.S.A.**, 1916.—We can deliver the famous model K from stock, the finest 4h.p. 3-speed countershaft machine on the market; price £62; exceptional exchange quotations, extended payment propositions of any reasonable character entertained. We are B.S.A. specialists, and our mechanics test and tune every machine before delivery.—Layton's Garage, Bicester, Oxon. Phone: 35. [X9284]

## Calcott.

**CALCOTT**, 1914, 2½h.p., excellent condition, new back tyre; photo; £16/10 for quick sale.—West, Twyford, Berks. [5046]

## Calthorpe.

**CALTHORPE**, 2h.p. Precision Junior engine, good condition; price £12.—Hyde, Burley, Hants. [4847]

**CALTHORPE**, 2½h.p., Michellins, 2-speed gear, good condition; £15.—31, Beechwood Av., Thornton Heath. [0809]

**1915** 2½h.p. Calthorpe-Jap, Enfield 2-speed gear, all accessories; owner called up; 25 gns.—4, Talbot St., Burnley. [X9184]

**1916** Calthorpe 4h.p. Twin-Jap Combination, unused, 67 gns., or exchange for lightweight and cash.—4, Talbot St., Burnley. [X9186]

**CALTHORPE**, 1914, 2-speed, in excellent condition, reliable machine, climb anything; £15/15.—Newham, 225, Hammersmith Rd., W. [5007]

## MOTOR CYCLES FOR SALE.

## Calthorpe.

**COLMORE** Depot, 31, Colmore Row, Birmingham. have in stock all models of Calthorpes for immediate delivery; also at our Manchester Depot. [0793]

**CALTHORPE**, 1916, 2-stroke, 2-speed, new, slightly shop-soiled; special bargain, £28/17/6.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4913]

**CALTHORPE**, 1916, latest model, 2-stroke, Enfield 2-speed gear, just arrived from works; £32/11.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4912]

**CALTHORPE-J.A.P.**, 1916, latest model, 2½ h.p., Enfield 2-speed gear, just arrived from works; £37/16.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4911]

**CALTHORPE**, 2½ h.p. J.A.P., with Enfield 2-speed gear, brand new, shop-soiled only; list £36/15, accept £35.—P. J. Evans, John Bright St., Birmingham. [X9263]

**CALTHORPES**.—These splendid little models in stock, £37/16; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4941]

**CALTHORPE Motor Cycles**, 1916 models.—Just arrived: 2-stroke 2-speed 31 gns. J.A.P. 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [0777]

**CALTHORPE**, latest 1916, 2-speed models in stock; cash or exchange, no waiting; also a few brand new 1915 models, slightly soiled, at reduced prices.—Eagles and Co., High St., Acton, London. [X9249]

**CALTHORPE**, brand new, 2½ h.p. 2-stroke, h.b. controlled mag., aluminium footboards, Moseley tyres, Druid forks; £28/16, or deposit £8 and 12 payments of 39/5.—Seen at Juno Showrooms, 248, Bishopsgate, London. [5157]

**CALTHORPE-J.A.P.**, 1916, latest 2-speed models in stock, 36 gns.; lady's 2-stroke, 2-speed, 34 gns.; extended terms quoted.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C.1, City Agents. Phone: Avenue 5548. [0491]

**CALTHORPES**, all 1916 models, ex actual stock, including the new 4 h.p. combination at 67 gns. Write or call for lists. Exchanges.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5192]

## Campion.

**1914** 6 h.p. Champion Combination, lamp, horn, and spares; accept £48.—Vaux, Seed Merchant, Pontefract. [X9239]

**1915** 4½ h.p. Champion-Precision, 4-speed, sidecar, Lucas fittings, spares, done 2,000; cost £89, £55.—Walker, Jun., 37, Briggate, Leeds. [X9077]

## Centaur.

**CENTAUR**, T.T., 2½ h.p. twin, 1913, show model, just overhauled, 3 speeds, new tyres and belt, lamps; £27/10, or cash offer.—Meeten, Dorking. [5026]

**CENTAUR**, 3½ h.p., nearly new Dunlop tubes, tyres, handlebars, horn, and accumulator. Dermotie belt, footboards—war bargain (enlisted), £7/15—Apply downstairs, or write, Bellington, 58, Mall Rd., Hammer-smith. [5079]

## Chater-Lea.

**CHATER-LEA** 3½ h.p. Twin, 3-speed, clutch, kick starter, double action spring forks, excellent condition; absolute bargain. £22.—Graham, 27, Wandale Rd., Upper Tooting. [5056]

**CHATER-LEA** Combination, 1913 model, 3-speed, P. and H. lamps, Cowey speedometer, new tube, tyre, tools, etc., in splendid condition; £50, no reasonable offer refused.—110, Kennington Rd., S.E. [5038]

**1914** Chater-Lea, 8 h.p., 3-speed, countershaft, large coachbuilt sidecar, hood and screen, speedometer, clock, lamps, horn, a very fine outfit; £55.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [4889]

## Chater-Precision.

**1914** Chater-Precision, 8 h.p., 3-speed countershaft gear, plate clutch, large coachbuilt sidecar, luggage carrier, hood, screen, speedometer, lamps, horns, etc., complete outfit, in fine condition; £52.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [4926]

## Chater-Lea-Jap.

**CHATER-LEA**, J.A.P., 1913, 3½ h.p., 2-speed, Bosch, Binks, speedometer, lamps, horn, tyres good, tools, spares; £30.—21, York Rise, Dartmouth Park Hill, N. [4852]

## Clarendon.

**3½ h.p.** Clarendon, Hellesen's ignition, good tyres, Binks, footboards, fast; £10, offers.—J. S. Kneebone, Laity, Helston. [4877]

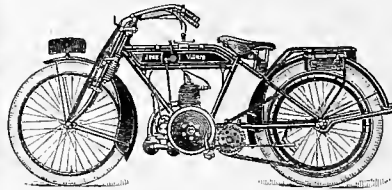
## Clyno.

**CLYNO**, 6 h.p., sidecar, 2-speed, free engine, kick start, new tyres, good condition; £28.—Booth, Ball Have Rd., Leek, Staffs. [X9048]

**CLYNO** Combination, in excellent order; £36, or nearest offer—any test, any hill; owner buying car.—102, Selby Rd., Tooting. [4938]

**CLYNO** Combination, 1914, detachable wheels, coachbuilt sidecar, 3 speeds, kick starter, countershaft, new chains; £45.—Percy and Co., 337, Euston Rd., London. [6181]

# JUNO MOTOR CYCLES ARE THE VERY BEST



Sergt.-Major J. BENNETT, Upavon, Wilts, writes under date 28/3/16:

"I am pleased in every way with my **JUNO V.T.S.** motor. It has given me not the slightest trouble the whole twelve months I have run it, approximately **10,000 miles**. The bearings are good as new, no shake anywhere, though the machine has done sidecar work for last eight months. It is and has always been the admiration of everyone who has seen and known it since I have had it."

This is only one of many testimonials as to the high quality of the "**JUNOS**."

**JUNO**, 2½ h.p., £29 10s., or £6 deposit and 41/8 month.

" 2-speed, £36, or £7 8s. deposit and 51/- month.

" V.T.S., £30 10s., or £6 4s. deposit and 43/- month.

" " 2-speed, £37, or £7 16s. deposit and 52/- month.

" 4 h.p., £62 15s., or £16 deposit and 83/4 month.

" 6 h.p., £75 12s., or £16 10s. deposit and 105/- month.

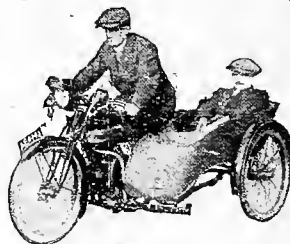
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## Clyno.

**1912** Clyno, 6 h.p., 2-speed, free engine, kick starter, coachwork sidecar, in splendid order, guaranteed; £33.—Colm, 15, Bridle Lane, Beak St., Regent St., W. [4987]

## Connaught.

**CONNAUGHT**, 1915, 2-stroke, 2-speed; £24, bargain.—11, Luna Rd., Thornton Heath, S.E. [5048]

**1916** Connaught Miniature, single and 2-speed, in stock.—Williams, Chapel Ash Depot, Wolverhampton. [X9190]

**CONNAUGHTS** in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £28/7.—P. J. Evans, John Bright St., Birmingham. [X9267]

## Coventry Eagle.

**COVENTRY** Eagle, 3½ h.p., coachbuilt sidecar, 3-speed, clutch, kick start, King Dick engine, countershaft drive, late 1915, perfect condition; £57/10.—146, Coldershaw Rd., Ealing. [4983]

## Crescent.

**CRESCENT-VILLIERS**, 2½ h.p., Druid fork, Avon tyres, Amac carburettor, E.I.C. mag., B. and L. drip feed lubrication, £30; or with Albion 2-speed countershaft gear, £37; lady's model, 25/- extra; in stock.—Rudge-Whitworth, 230, Tottenham Court Rd., W. [X9141]

## Dayton.

**DAYTON** Lightweight, 2-stroke motor cycle, in perfect order; £15; new tyre on back.—Bethell, Long Marston, Tring. [X9121]

## De Dion.

**DE DION**, 2½ h.p., Bosch mag., perfect running order; £7.—F. Whittle, Craven Arms. [X8823]

**2½ h.p.** De Dion Lightweight, low frame, fast, carry 24 passenger, good tyres, leather belt, C.A.V. mag., B.B. carburettor; sacrifice, £12/10.—W. Tombs, 39, Upper Rd., Bandon Hill, Croydon. [5027]

## Douglas.

**1914** Douglas, 2-speed, accessories; £35.—Curd, 17, Gardner St., Brighton. [5041]

**1916** Douglas, 2½ h.p. U, new last month, only ridden few miles; offers.—Blackham, Chemist, Oldbury. [X9168]

**DOUGLAS**, 2-speed, and footboards, absolutely as sent out from works; £38.—Bunting, Harrow. [5114]

**1912** Douglas 2½ h.p. Motor Cycle, just overhauled; bargain, £24.—R. J. Simpson, Lazonby, Cumberland. [X9198]

**DOUGLAS**, 1914, 2½ h.p., T.T. War Office model, 2 speeds; £34.—Percy and Co., 337, Euston Rd., London. [5182]

**1915** Douglas, new May, 2 speeds, Lucas lamps, picked machine; £41.—10, Norwood Crescent, Southport. [X8431]

**DOUGLAS**, 1914, 2½ h.p., 2-speed, speedometer, lamps, splendid condition; £30.—7, Surbiton Rd., Kingston. [5012]

**DOUGLAS**, 1915 model U, 3-speed Amac, practically new; £47; late owner enlisted.—Gibb, Gough, Gloucester. [X8617]

**DOUGLAS**, 1912, condition like new, accessories, spares; £25, lowest.—Cowdron, 15, Parsons Heath, Colebeater. [4955]

**1914½** 2-speed 2½ h.p. Douglas, clutch model, very fast, good order; £33.—Win. Gossip, Knowsley, Inverness. (D) [X9104]

**1915** 4 h.p. Douglas, as new, ridden only 1,100 miles, lamps, speedometer, etc.; price £55.—Sanders, Bridge St., Hitchin. [X9253]

**1909** Douglas, 2½ h.p., new tyres, new carburettor; a nice little cheap motor; £13.—Jones, Garage, Broadway, Muswell Hill. [5150]

**DOUGLAS**, 1914, model U, 2-speed; lamps, speedometer, and accessories, little used; £40.—Owen, 19, Battersea Rise, S.W. [5052]

**2½ h.p.** T.T. 2-speed Douglas, late 1913, speedometer, Binks carburettor, accessories; £33.—S. Ashley Rd., Hampton, Middlesex. [5086]

**DOUGLAS**, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas. Moffat, Yeovil. Tel.: 50. [9203]

**DOUGLAS** 4 h.p. 1915 Combination, had little use; 65 gns, or offer.—Spauling, The Cottage, 2, Broudesbury Park, Kilburn, N.W. [4946]

**1914** Douglas, 2-speed, tyres and belt as new, just overhauled, front and rear lamps; approval; £31.—Stoner, Aylsham, Norfolk. [5022]

**DOUGLAS** Combination, 1915, 4 h.p., 3 speeds, kick starter, in exceptional nice order; £65.—Percy and Co., 337, Euston Rd., London. [5178]

**DOUGLAS**, bought late 1915, 2 speeds, absolutely as new, scarcely used; sacrifice 36 gns.—Seen 435, Whitehorse Rd., Thornton Heath. [4971]

**DOUGLAS**, 2½ h.p., late 1913, kick start, 2 speeds, clutch model, splendid condition; £30.—F. Stradwick, 34, Ashvale Rd., Tooting, S.W. [5030]

**DOUGLAS**.—We have usually in stock second-hand Douglas from 1911 to 1915; prices £20 to £47. Write for list, or better call.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5186]

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WILLIAMSON W.-C. Combination.....	\$89 15
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ROYAL RUBY, 6 h.p., 3-speed.....	\$87 0
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LEVIS, 2½ h.p., 2-stroke.....	\$32 0
SUNBEAM, 3½ h.p., 3-speed.....	\$73 10
EXCELSIOR (American), 7 h.p., 3 speeds.....	\$75 0
CALTHORPE Minor, 2-seater.....	185 gns.
NEW IMPERIAL, 2½ h.p., variable magneto.....	\$38 0
DOUGLAS MODELS.—Orders backed now.	

## (U.S.A.) EXCELSIOR,

1916, 7 h.p., 3-speed model, 84×89, countershaft gear chain drive, mechanical and hand lubrication, high-tension magneto, multiple-disc clutch with dual control, kick starter, 2 gallons petrol capacity: \$75. Exchanges quoted. Easy Payments arranged. Sale Yorkshire distributors. Trade supplied.

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to suit American Excelsior and Harley-Davidson machines, 28×3 Dunlop tyre, grey coach-built body and chassis..... \$13 10

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1913 3½ h.p. ROVER, 3-speed.....	\$37 10
1913 3½ h.p. F.E. RUDGE.....	\$26 10
1913 3½ h.p. ROVER, Grado gear.....	\$27 10
1913 3½ h.p. 2-speed TORPEDO.....	\$19 10
1912 3½ h.p. ZENITH-GRADUA.....	\$26 10
1912 3½ h.p. 2-sp. BRADBURY, chain drive.....	\$29 10
1912 3½ h.p. 2-speed F.E. PREMIER.....	\$27 10
1912 3½ h.p. 2-speed F.E. HUMBER.....	\$26 10
EXCELSIOR, 3½ h.p., 3-speed, Druid forks.....	\$19 10
KERRY, 3 h.p., magneto, Saxon forks.....	\$12 10
5½ h.p. Magneto REX, spring forks.....	\$12 10
N.S.U. twin, 2-speed, spring forks.....	\$15 10
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REX, 1910, 5-6 h.p., 2-speed, F.E.....	\$22 10
REX, 1909, 5-6 h.p., 2-speed, F.E.....	\$18 10
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1913 7-9 h.p. QUADRANT and Sidecar.....	\$49 10
1912 3½ h.p. 2-speed PREMIER and Sidecar.....	\$33 10
1910 3½ h.p. 2-speed REX and Sidecar.....	\$24 10
3½ h.p. 2-speed P. & M. and Sidecar.....	\$19 10
REX 5½ h.p., 2-speed, and Sidecar.....	\$22 10

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G.W.K., 2-seater, all accessories.....	\$92 10
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RENO 15 h.p. 4-cylinder Touring Car.....	\$65 0
PREMIER 7-9 h.p. 2-seater Light Car.....	\$67 10
1916 12 h.p. New Type OVERLAND.....	\$225 0
New Mechanical Horns.....	17/6
New Acetylene Tail Lamp, post free.....	1/4
At Mudscree, cost 21/-, take.....	10/6
P. & H. Separate Generator Lamp.....	17/6
Miller's late type Lamp Set.....	\$1 4
REX, 6 h.p., twin engine, magneto and carb.....	\$9 10
8 h.p. Water-cooled Engine, fine condition.....	\$4 10

Cash Offers Solicited.

WANTED.—Second-hand Douglas, for cash.

## MOTOR CYCLES FOR SALE.

Douglas.

IMMEDIATE Delivery new Douglas, 3-speed, 1915 3-speed, 1914 2-speed, both as new; written guarantees willingly.—Gibb Gough, Gloucester.

LATE 1914 Douglas, model U, just overhauled, topping condition inside and out, fast and excellent climber, usual accessories; 38 gns.—Mawson, Ravensworth Terrace, Durham. [X9118]

COLMORE Depot, Birmingham, Manchester, Leicester, and Liverpool, have in stock complete range of all models Douglas for immediate delivery, also full range of spares. [0800]

DOUGLAS, 1912, engine and magneto just overhauled by makers, all working parts renewed, everything in excellent condition; £23, offers.—Treddell, Jannagar, Staines. [4968]

1915 Douglas, War Office model, bought last October, hardly been used, in new condition, horn, but no lamps; price £43; viewed and tried by appointment only.—Captain Wheeler, Springfield, Spring Vale, Ryde. [5037]

DOUGLAS 1915 4 h.p. Tourist Trophy Model, countershaft 3-speed gear, tyres not worn, Cowey speedometer, head lamp, tail lamp, and horn, condition as new; £58.—The Premier Motor Co., Aston Rd., Birmingham. [5131]

2½ h.p. Douglas, late 1914, 2-speed, clutch, Lucas lamp, generator, horn, speedometer, tools, beautiful condition, and perfect running order, complete; £37/10.—George Rogers, 47, Coronation Rd., Crosby, Liverpool. [X9213]

1915 Douglas, 2½ h.p., 2-speed, T.T. model V, all black, with lamps, horn, speedometer, new last October, little used; seen at St. George's Garage, Festsmonth; £42/10.—Sub. Lieut. H. B. Crane, R.N., H.M.S. Titania, c/o G.P.O. [4875]

DOUGLAS, late 1914, 2½ h.p., 2-speed, clutch, kick start, Watsons' speedometer, lamps, horn, Kial saddle, tyres nearly new, just overhauled, engine perfect; 40 gns., including insurance, 8 months unexpired.—Clark, 32, Albert Rd., Dalston, London. [4936]

DOUGLAS Agents and Specialists.—It is difficult to obtain immediate deliveries of new Douglas motor bicycles. We do not state we can supply in all cases from stock, but we solicit enquiries for these famous machines, and orders will receive our best attention and every effort will be made to execute same. Tel.: 388. Telegrams: Bicycles.—Robinson's Garage, Green St., Cambridge. [5057]

## Dreadnought.

DREADNOUGHT - VILLIERS, 2½ h.p., 2-stroke, countershaft 2-speed, new last August, good tyres, 2 belts, Lucas lamp, rear light, horn, belt case, long exhaust pipe, all in fine condition; £30, or offer.—54, Chive Rd., Rochester. [4844]

## Elswick.

1915 2½ h.p. Elswick 2-stroke, tyres excellent, engine guaranteed perfect; £18.—Robinson's Garage, Green St., Cambridge. [5061]

## Enfield.

2½ h.p. Enfield Twin; £12: part exchange.—Maulden, 4 High St., Aldeburgh-on-Sea. [X8815]

1911 2½ h.p. Royal Enfield Lightweight; £12.—Lane, 14, Malham Rd., Forest Hill. [4900]

COLMORE Depot, 31, Colmore Row, Birmingham, for immediate delivery of Enfields. [0801]

ENFIELD 6 h.p. Combination, 1916, run 300 miles, guaranteed like new; £75.—Percy and Co., 337, Euston Rd., London. [5180]

ENFIELD, 1916, 3 h.p., just arrived from works; £52/10.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4917]

ENFIELD 5 h.p. Twin, 1915, grand condition, and speedy; seen any time; £42.—4, Hanover St., Regent St., London, W. [5102]

ENFIELD 1914 6 h.p. Combination, complete, all accessories, excellent condition; £55.—P. J. Evans, John Bright St., Birmingham. [X9268a]

ENFIELD 1913 Coachbuilt Combination, child's seat, carefully used, perfect; sacrifice, £47.—40, Mildenhall Rd., Lower Clapton. [5055]

ENFIELD Late 1913 6 h.p. Combination, perfect condition, speedometer, luggage grid, etc.; £47.—18, Tanza Rd., Hampstead (after 6). [5137]

ENFIELD Combination, 6 h.p., 1915, 3 Lucas lamps, generators, accessories; accept £61 for quick sale.—511, Lordship Lane, East Dulwich. [5082]

1913 Enfield 6 h.p. Combination, handle starter, 2-speed, chain drive, Lucas lamps, horn, spares; £42, bargain.—48, Hammersmith Rd., W. [5087]

ENFIELD Late 1914 6 h.p. Smart Coachbuilt Combination, good condition; first cheque £55 for quick sale.—Box L1, 328, c/o The Motor Cycle. [4933]

ENFIELD, 1916, 2-stroke, 2½ h.p., 2-speed, and free engine, just arrived from works; £42.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4916]

ENFIELD 2-stroke, 1915, 2-speed, Palmer tyres, all in splendid order, and as new; £36; easy payments if desired.—Jones, Garage, Broadway, Minsell Hill. [5152]

ENFIELDS actually in stock for immediate delivery, 6 h.p. combinations, 3 h.p. and 2½ h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [X9269]

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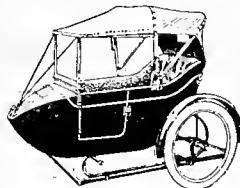
1916 MORGAN-DE-LUXE, all on.....	\$121 0
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1916 4 h.p. A.J.S. Combination, interchangeable wheels.....	90 gns.
1916 6 h.p. ENFIELD Combination.....	85 gns.
1916 8 h.p. ENFIELD Combination.....	87 gns.
1916 6 h.p. J.H. Combination.....	90 gns.
1916 6 h.p. NEW HUDSON.....	72 gns.
1916 6 h.p. NEW HUDSON Combination.....	80 gns.
1916 2½ h.p. NEW HUDSON, 2-sp., 2-stroke.....	\$38 0
1916 2½ h.p. OMEGA-J.A.P., 2-speed.....	38 gns.
1916 2½ h.p. OMEGA, 2-stroke, 2 speed.....	38 gns.
1916 8 h.p. British EXCELSIOR Combination, Jardine 4-speed gear.....	\$98 0
1916 5-6 h.p. British EXCELSIOR, Sturmeys countershaft 3-speed gear.....	68 gns.
1916 4½ h.p. British EXCELSIOR, Sturmeys countershaft 3-speed gear.....	64 gns.
1916 FORD Touring Car, 20 h.p.....	\$135 0
1916 FORD Chassis, 20 h.p.....	\$115 0
1916 FORD Van 20 h.p.....	\$130 0
1916 20 h.p. FORD Ambulance.....	\$135 0
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on.....	\$120 0

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1914 5 h.p. RED ZENITH, countershaft, clutch.....	\$48 0
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1913 SCOTT, lamp, speedometer, etc.....	\$30 0
3½ h.p. ROVER, 1913, 3-speed.....	\$29 0
1915 WOLF, lightweight, 3-speed.....	\$25 0
2-speed RADCO, 2-stroke, fine condition.....	\$25 0
2-stroke OMEGA, Druid forks.....	\$19 0
1914 DOUGLAS, 2-speed, fine machine.....	\$38 0
3½ h.p. N.S.U., spring frame, 2-speed.....	\$17 0
3½ h.p. TRIUMPH, 1911, clutch model.....	\$22 0
3½ h.p. 1908 TRIUMPH, fine goer.....	\$17 0
3½ h.p. 1909 REX de Luxe, 2-speed, handle starting.....	\$19 0
1913 FORD, English body, Bosch magneto, disc wheels.....	\$84 0

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Underling Chassis, with Luggage Carrier combined.

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## NEW MOTOR CYCLE FRAMES.

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25/- each.

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Nice Coach-built Sidecar.....	\$4 0
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Few Single and Twin magnetos, new.....	22/3
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8 h.p. J.A.P. Twin Engine, air-cooled.....	\$12 12
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F.R.S. Lamp Set, 1,000 beam, shop-soiled.....	45/-
New Clincher Clearance Covers, de Luxe, "heavy," rubber-studded, 26 x 2½, 26 x 2½, 26 x 2½, and 26 x 2½ x 2½.....	\$1 0
Latest Mechanical Horn, black and nickel.....	\$1 0
Cowey Speedometer, out of order.....	\$1 0
Set of Miller's Cycle Car Lamps and Generator (new).....	\$3 0
Linkin Cycle Car Carburettor, 8 h.p. size.....	15/-
Cox Cycle Car Carburettor.....	10/-

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## MOTOR CYCLES FOR SALE.

## Enfield.

**1914** 6h.p. Enfield. Combination, luggage carrier, lamps, etc., very little used, condition as new; £58, genuine bargain.—436, Whitehorse Rd., Thornton Heath. [4970]

**ENFIELD** Late 1913 6h.p. Combination, new tyres, speedometer, lamps, etc., in first-class condition; £50, or near offer; any trial.—3, Carson Rd., W. Dulwich. [4998]

**ENFIELD**, 1915. 2-speed, 3h.p. twin, T.T. model. Electric light and horn, Binks, tyres and condition perfect; £57/10.—Reader, 4, North Side, Wandsworth Common. [5171]

**ENFIELD** 1916 Combinations.—We have them in stock; cash price £89/5. Exceptional exchange quotations; extended payment propositions of any reasonable character entertained.—Layton's Garage, Bicester, Oxon. [X9285]

**ENFIELD** Combination, 6h.p., 1914 coachbuilt, little used, Jones trip speedometer, watch, Lucas horn, Lucas King Road lamp, electric rear light, tyres and everything in excellent condition, with tools and spares, complete; £62.—Walker, Cromdale, Hayes Rd., Bromley, Kent. [X9224]

## Excelsior.

**1915** British Excelsior, 2½h.p., 2-stroke, single gear, variable ignition, as good as new, not done 500 miles; going in for sidecar; £27/10.—Hewitt, Pyrmont, Walsgrave Rd., Coventry. [X9291]

**EXCELSIOR** Late 1914 7h.p. 3-speed Combination, complete with dynamo lighting outfit, and coachbuilt sidecar, with screen, speedometer, and all accessories, only done 1,000 miles; £78; exchanges arranged.—Maude's Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5195]

## Fafnir.

**3½h.p.** Fafnir, all accessories, smart appearance, very fast; £15.—169a, Lower Clapton Rd., N.E. [X9229]

## F.N.

**4½h.p.** 4-cyl. F.N., £8; another, £10; sell parts.—224, Grove St., Upper Edmonton, London. [5083]

**F.N.**, and nearly new coachbuilt sidecar; £14; £2 allowed towards tax.—199, Crystal Palace Rd., E. Dulwich. [X9169]

**F.N.**, 1912, 4-cyl., 2-speed clutch, just overhauled, new gears, perfect condition; sale or exchange for good 3½h.p.—7, Pembroke Rd., Norwich. [4873]

**F.N.**, 4-cyl., 1912, 2 speeds and clutch, recently overhauled; £27/10, or will exchange for a 3½h.p. single-cyl.—10, Trafalgar Rd., Twickenham. [5044]

**F.N.**, 5-h.p., 1913, 2-speed, clutch, Binks, new cover, speedometer, thoroughly good condition throughout; £35; sidecar, £5; sole reasons from 51, Victoria St., Dunstable. [4951]

## Harley-Davidson.

**BRAND** New Harley-Davidsons.—See below.

**MODEL F.** 7-9h.p., 3-speed; £68.—The Premier Motor Co.

**MODEL J.** 7-9h.p., 3-speed, with dynamo electric lighting outfit; £75.—The Premier Motor Co.

**THE** Above are guaranteed brand new; standard specification and standard equipment.—The Premier Motor Co., Birmingham.

**SPECIAL** Gloria Sidecars, to match; 19 and 25 gns. You save £17 by purchasing your new combination direct from the recognised H.D. experts. Delivery carriage paid to any address.—The Premier Motor Co., Aston Rd., Birmingham. [4467]

**HARLEY-DAVIDSON'S**, 1916 models; immediate delivery from stock.—Colmore Depot, 261, Deansgate, Manchester. [4667]

**1915** Harley, new, electric light dynamo, with £22 sidecar, hood, screen; £89.—Box L1,324, c/o The Motor Cycle. [4906]

**11F** Harley-Davidson, run 2,000; £54; with new Millford sidecar, £56.—4, Thornton St., Kingston, Bedford. [X9193]

**1915** 4½h.p. Harley-Davidson, only run 2,079 miles, speedometer, lamps, unscratched; £41.—Crow Bros., Guildford. [5092]

**LATE** 1915 Harley-Davidson Combination, electric equipment, as new; £80; Douglas part payment.—Nelson, Gloddaeth St., Llandudno. [X9178]

**1915** 7h.p. Harley-Davidson Motor Cycle and coachbuilt sidecar; cost nearly £100; owner called up; accept 59 gns.—4, Talbot St., Burnley. [X9181]

**HARLEY-DAVIDSON** 11J, Oct., 1915, coachbuilt sidecar, electric equipment, splendid condition; £80.—Bowen, 94, Park Lane, Croydon. [X9226]

**COLMORE** Depot, Birmingham, Manchester, Liverpool, Leicester, for immediate delivery of all models of Harley-Davidsons and spare parts. [0802]

**HARLEY-DAVIDSON'S**.—1915 riders say "they're simply it." Deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4940]

**HARLEY-DAVIDSON** and Coachbuilt Model 11F, new last October, 1,500 miles only, speedometer, lighting set, perfect; £65.—Alcock, Wootton River, Marlborough. [4929]

## GODFREY'S

## THE VALUE OF A NAME.

*It is no unusual thing for Godfrey's to execute an order for an entirely new customer, living, perhaps, hundreds of miles from London, who is quite content to send his money for a machine selected from our list (and which he has not even seen), trusting to the reputation of the Firm to send him value for money.*

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## Harley-Davidson.

**MODEL J** Late 1915 7-9h.p. Harley-Davidson, 3-speed, complete electrical equipment, Montgomery sidecar, little used; bargain, £70.—Harry Bolt, 113, Bath Rd., Exeter. [6003]

**1915** Harley-Davidson, model 110, 4½h.p., single-cyl., 2-speed, chain drive, H.D. etc., comprising head lamp, tail lamp, and horn, only used for few hundred miles, new condition throughout, and fully guaranteed; £48.—The Premier Motor Co., Aston Rd., Birmingham. [5132]

**1915** Model 11J 7-9h.p. Harley-Davidson, 3-speed, with dynamo electric lighting outfit, special spring-wheel Gloria sidecar to match; the most luxurious and distinctive outfit possible, complete combination equal to new in every respect; £90.—The Premier Motor Co., Aston Rd., Birmingham. [5133]

**1915** Harley-Davidson, delivered November, 1915, 7-9h.p. 3-speed clutch model, new Palmer nord car size tyre on rear wheel, fitted with very smart almost new Mills-Fulford sidecar, upholstered in green, wind screen, dust cover, etc., unused Dunlop heavy tyre fitted; price £68.—Vincent Motor Co., Rugeley Camp, nr. Stafford. [4268]

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**HENDERSON** 4-cyl. Motor Cycle, £85 nett; early delivery; deferred terms from one-quarter down, balance by twelve monthly instalments. Clients purchasing motor cycles from us can practise on the private road and test hill alongside these premises before venturing out into the West End traffic, this being the only London garage in the West End possessing this facility, and also being the only London garage that is totally bomb-proof. We garage Henderson motor cycles for 1/- per week, and in the event of your being called to the colours, we will store same, pending your return, for the nominal sum of 1/- per month.—Messrs. Greco Taxis, Villiers St. Garage, Charing Cross, London. [4058]

## Hobart.

**HOBART**, 1916 models in stock; 2½h.p. 2-speed 2-stroke, 36 gns.; your present machine can be taken as part payment.—Elce and Co., 15-16, Bishops-gate Av., Camomile St., E.C. [0481]

## Humber.

**HUMBER** and Lovely Coach Sidecar; £27/10.—Bunting, Harrow. [5116]

**3½h.p.** Humber, Roc, good condition, good tyres; £12. —30, Harrow Rd., Leytonstone. [4935]

**3½h.p.** Humber, 2-speed, in splendid condition; £126. —lowest.—169a, Lower Clapton Rd., N.E. [X9228]

**3½h.p.** Humber and sidecar, gears want repairing; what offers?—136, St. Ann's Rd., Tottenham. [X9113]

**HUMBER**, 1912, 3½h.p., 2-speed, sidecar, good condition; £26.—N. F. Granger, St. Ives, Hunts. [4995]

**HUMBER**, 3½h.p., splendid order throughout; owner must sell immediately; £5/10.—45, Church Rd., Acton. [X9219]

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**3½h.p.** Humber, 2-speed, F.E., and sidecar, fine condition; £33; seen any time; trial given; instruction free.—54, Newton St., Bridport Place, London, N. [4885]

**1912** 2-speed 3½h.p. Humber, thoroughly overhauled, new rear tyre and belt, completely squared; £25; any trial.—Elliot's Garage, Cross St., Leyton. [X8225]

**HUMBER**, 3½h.p., 1912-15, 2-speed, free, Enfield coachbuilt sidecar, most reliable, offered in perfect order and condition; bargain, £25.—14, Doddbrooke Rd., West Norwood. [5005]

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## Indian.

**INDIAN**, new 1916 5h.p. model in stock; no waiting.—Moss, Wem. [X9257]

**INDIAN**, 1914, 7-9h.p., T.T. road racer, in splendid order; £38.—Below.

**INDIAN**, 1915, 5h.p., T.T., 3 speeds, clutch, and kick starter, in perfect condition; £52.—Below.

**INDIAN**, 1913, 7-9h.p., T.T. road racer, Senspray carburettor, very fast; £28.—Elce and Co., 15-16, Bishops-gate Av., Camomile St., E.C. [0552]

**INDIAN**, 1913, 7h.p., and sidecar, 2 speeds, clutch; £38.—672, Commercial Rd., London, E. [X9147]

**INDIAN**, 5h.p., 3-speed, only done 300 miles, P. and H. lamp, horn, etc.; £56.—Roberts, Bryn-Awel, Mold. [X9041]

**7h.p.** Indian Combination, 1914, electric equipment, splendid condition; £50.—5, Circus Rd., St. John's Wood, London. [X9126]

**INDIAN**, 7h.p. model F, power plus, 1916, with luxurious sidecar, brand new.—Ayscough, Penarth Hotel, Penarth. [X8574]

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1916 Indian Combination, 3-speed, clutch, kick starter, lamps, speedometer, like new: £68.—60, Wallingford Av., N. Kensington. [X9040]

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INDIAN 1914 Combination, 7.9-h.p., 2 speeds, sidecar brand new (cost £18): £45, complete.—Percy and Co., 337, Enston Rd., London. [5179]

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INDIAN, 1915, and smart coachbuilt Watsonian sidecar, 7.9-h.p., clutch model, new condition: £55.—P. J. Evans, John Bright St., Birmingham. [X9270]

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INDIAN, 7h.p., late 1915, 3-speed, spring frame, electric equipment, speedometer, Millford sidecar to match, mileage under 5,000, as new; must sell: £65.—29, Brigstock Rd., Thornton Heath. [5080]

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- COLMORE Depot, 261, Deansgate, Manchester, have in stock complete range of James motor cycles. [0803]
- JAMES, 4½ h.p., 3-speed countershaft, with sidecar, coverall apron; £45.—Clark and Co., Motor Engineers, Doncaster. [4908]
- JAMES 1914 3½ h.p. Twin, 3-speed clutch, lamp, horn, speedometer, recently overhauled; £40.—Taylor, 37, Lovelace Gardens, Salford. [5075]
- JAMES, 4½ h.p., 3 speeds, kick-starter, brand new, shop-soiled only; list £66/5, accept 60 gns.—P. J. Evans, John Bright St., Birmingham. [X9265]
- JAMES, 1914½, 4½ h.p., 3-speed countershaft, conch-built sidecar, speedometer, accessories; £45.—Kemp, J.P., 18, Woodstock Rd., Chiswick. [4880]
- JAMES, 4½ h.p., 3-speed, 1916, Canoelet sidecar, not done 250 miles, as new, 2 lamps, horn; particulars on application.—J. Rogers, 14, Cowgate, Peterborough. [4848]
- 1916 James, 2-stroke, 2-speed, new Feb. last, 2 Lucas lamps and horn, in excellent condition, climb anything, easy to start, and easy to control; price £35.—Cliff and Sons, Eltham. [4976]
- JAMES, 1915, 2½ h.p., 2-stroke, 2-speed countershaft, Seaspray carburettor, E.L.C. mag., Dunlop tyres, lamps, splendid condition; £20.—Tom Taylor and Sons, Bridge House, Staines. [5129]

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- 4 h.p. J.A.P. and sidecar, N.S.U. gear, Bosch; bargain. £15.—89, Walsall St., Wednesbury. [X9153]

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- J.E.S., 1913, 1 h.p. lightweight, mag., runs well; gift, 29/15.—1, Ebner St., Wandsworth. [X9150]
- J.E.S. Motor Attachment, Rover bicycle, 3-speed gear, run 500 miles; £12.—Moorhouse, 6, Aberdour Gardens, Goodmayes, Ilford. [4984]

J.H.

- 2½ h.p. J.H., 1916, 2 speeds, clutch, only run 500 miles; £48; exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [4572]
- J.H.—Brand new late 1915 combination, 6 h.p., M.A.G. engine, 3-speed gear and chain drive, complete with Canoelet sidecar with hood and screen; list price £99; fully guaranteed and offered at £82/10.—Mandess Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5191]

Kelecom.

- KELECOM, 4 h.p., and sidecar, Phoenix gear; bargain, £15/10.—Partridge, Grocer, 174, Ealing Rd., W. [5071]

Levis.

- LEVIS, new 1916 Popular model in stock; no waiting.—Moss, Wem. [X9258]
- COLMORE Depots, Birmingham and Leicester, for delivery of all models of Levis motor cycles from stock. [0804]
- LEVIS Popular, or new model E; immediate delivery; easy terms 2½ extra.—Referee Cycle Co., 332, High Holborn. [0764]
- LEVIS, 2½ h.p., 2 months old, like new, nscratched; bargain, 23 gns.—Newham, 223, Hammersmith Rd., W. [5006]
- 1915 Popular Levis, P. and H. lamp set, overalls and accessories; £22/10.—Kennett, 29, Millman St., Bloomsbury. [X9172]
- LEVIS New Popular Model, 2½ h.p.; £30; immediate delivery.—Rudge-Whitworth, Ltd., 230, Tottenham Court Rd., London, W. [X9143]
- 1915 Levis, as new, all accessories, in perfect order; £24.—Jones, Garage, Broadway, Muswell Hill. Easy payments if desired. [4836]
- 1915 2½ h.p. Levis, spring frame, Enfield gear, Roman rims; £35, or near offer.—Capt. Dodd, 4, St. George's Terrace, Newcastle. [X9244]
- LEVIS Popular Model, new, slightly shop-soiled, special bargain. £26/10.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [4915]
- LEVISES, 1916 models actually in stock; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [4942]
- LEVIS, 2½ h.p., new, only done a few miles, Stewart speedometer, mechanical horn, Lucas lamps; £22.—Lewis, 157, Hatfield Rd., Wimbledon. [5011]
- LEVIS, 1916, Popular models.—We are sole Oxfordshire agents, and can deliver correctly tuned popular models at once.—Layton's Garage, Bicester, Oxon. [X9287]
- LEVIS, late 1914, 2½ h.p., perfect, splendid condition, Lucas lamps and horn, speedometer, tools, spares; £27.—Walsley, 4, Westcliffe Rd., Sharples, Bolton. [X9197]
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- L.M.C., 1914, 4 h.p., and Canoelet sidecar, 2 speeds, clutch, and kick starter, excellent condition; £38.—P. J. Evans, John Bright St., Birmingham. [X9271]
- 1916 L.M.C., 4 h.p., conch sidecar, Sturmer countershaft gear, automatic starter, Lucas lamp sets; first 250 miles; owner called up.—2, Ainger Rd., Chalk Farm, N.W. [X9231]
- L.M.C., 4½ h.p., with Sturmer-Archer 3-speed countershaft gear and kick starter, ideal machine for solo riding or sidecar; £68/4; in stock.—Rudge-Whitworth, Ltd., 230, Tottenham Court Rd., W. [X9142]

Martin.

- MARTIN-J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [0760]

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- MATCHLESS-J.A.P., 1915, 6 h.p., clutch model, lamps, horn, etc.; £50.—Riley, South Av., Stourbridge. [X9202]
- MATCHLESS Combination, 1915, 3-speed, kick starter, M.A.G. engine, speedometer; £70.—A. Cramer, High St., Orpington. [X9006]
- MATCHLESS 8 h.p. 1915 Combination, 3-speed, clutch, nice turnout; £60; Douglas wanted.—11, Luna Rd., Thornton Heath, S.E. [5049]
- MATCHLESS, 1913, 8 h.p., countershaft, chain, with 1915 Millford Empress sidecar, speedometer, lamps, etc., tyres as new; bargain, £47/10.—Head Chauffeur, 32, Culross St., Park Lane. [4903]
- 1914 6 h.p. Twin Matchless-Jap and cane sidecar (cost last year 17 gns.), lamps, generator, cycle, just paid £5 for overhaul; good bargain, £48; no dealers.—Smith, 1, Charlton Villa, Staines St., Bedford, Middlesex. [4979]
- MATCHLESS Combination, 1915½, M.A.G. engine, absolute perfect condition, looks nearly new, Stewart speedometer, brand new tyres just fitted, lamps, spares, etc.; absolute bargain, £75.—6, Lorenzo St., Pentonville Rd., London, W.C. [5166]
- MATCHLESS Coach Combination, late 1913, 6 h.p., 7-speed gear, kick-starter, fully equipped, tyres practically new, spare cover and tube, just been thoroughly overhauled, in grand condition, and guaranteed perfect; great bargain, £45.—Butler, Florist, Ascot. [5020]
- 1913 6 h.p. Matchless Combination, chain drive, 2-speed, clutch, kick starter, 3 lamps, 2 generators and other accessories, spare tubes, new chains and gear box recently fitted, not used since November last, splendid condition; 10, no offers.—P., 18, Noble St., E.C. Phone: 3961 Central. [4843]

Moto-Reve.

- 2½ h.p. Moto-Reve, mag., Druids, Whittle, toolbags, everything in splendid condition; £9.—72, Newport Rd., Middlesbrough. [X9237]

Motosacoche.

- 1913½ Motosacoche, Enfield 2-speed, 3½ h.p. twin, chain drive uncased; £19/19.—Wm. Gossip, Knowsley, Liverpool. (D) [X9105]
- MOTOSACOCHE, in good condition; 8 gns., great bargain.—Juliaas, Broad St., Reading. Biggest motor cycle and light car dealers in the South. Phone: 1024. [X5387]

New Hudson.

- NEW Hudson Late 1913 Combination; £40; machine alone £35.—A.W., 22, Camborne Av., W. Ealing. [4836]
- 1915 New Hudson, 2-stroke, Miller head set, special Dunlops, panniers, tools, new machine; £23 cash.—4, Risholme St., South Hackney. [5162]
- NEW Hudson, 1914, 4 h.p., 3-speed combination, splendid condition, very little used; £35.—Aiton, 123, Askew Rd., Shepherd's Bush. [4990]
- 1915 New Hudson 6 h.p. Combination, countershaft gear, complete, 2 lamps, and horn; bargain; £54.—Lawrence, Lichfield Rd., Bloxwich. [X9154]
- 1913 3½ h.p. New Hudson, 3-speed, free engine, with sidecar, lamps, etc., perfect order, a bargain, £29.—Phillips, Commercial St., Harrogate. [4905]
- 1914 New Hudson, 2-stroke, in perfect order, new tyres, climbs anything; £19/10; easy payments if desired.—Jones, Garage, Broadway, Muswell Hill. [4840]
- NEW Hudson Big Six Combination, 1914, splendid condition, 3 lamps, horn, speedometer, 4,000 miles; £55, or exchange light car and cash.—C.G.B., 90, Trafalgar Rd., Portlago. [4928]
- NEW Hudson, 1915, 4 h.p., military model, kick starter, hand and foot clutch, 3 speeds, footboards, lamps, horn, 2 generators, little use.—Bartlett, Post Office, Grantham. (D) [4901]
- NEW Hudson, 1914, 6 h.p., new in 1915, complete with sidecar, hood, side curtains, screen, Coverall apron, lamps, electric horn, exhaust whistle, petrol carrier, etc., condition as new, and guaranteed in perfect condition; £57/10.—Can be seen at Kickham's, Stokes Croft, Bristol. [4853]

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

**Advertising and Publishing Offices:**  
20, Tudor Street, London, E.C.

Telegrams: "Cyclist, Fleet, London."  
Telephone: 2348 City (five lines).

**Editorial Offices:**  
Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
Telephone: 10 Coventry (five lines).

**Northern Offices:**  
199, Deansgate, Manchester.

Telegrams: "Hiffe, Manchester."  
Telephone: 620 City.

**Subscription Rates:** Home, 6s. 6d.; all countries abroad, 10s. 10d. per annum.

**COLONIAL AND FOREIGN AGENTS:**  
UNITED STATES—The International News Agency, New York.  
News Co., Winnipeg; British Columbia News Co., Vancouver; Gordon & Gotch, Ltd., 132, Bay Street, Toronto.  
AUSTRALIA—Gordon & Gotch, Ltd., Melbourne (Victoria), Sydney (N.S.W.), Brisbane (Queensland), Adelaide (S.A.), Perth (W.A.), and Launceston (Tasmania).  
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## A Scrap of Paper? Another Aspect of the Motor Cycle Taxation Question.

SEVERAL of our readers have written to us to the effect that the licences which they took out at the beginning of the year authorise them, without any qualification whatever, to keep one motor bicycle or tricycle from the date of issue until the 31st day of December next following, and they wish to know whether the Government propose to treat these licences—German fashion—as scraps of paper, or whether these documents are not legally and morally binding upon the authorities who issued them. There seems to be much sound sense and good reason in these contentions. They would not, of course, apply to those who have taken out licences since the new proposals have been before Parliament, and to whom licences are issued at the old fee of 20s., this amount being considered to be an instalment.

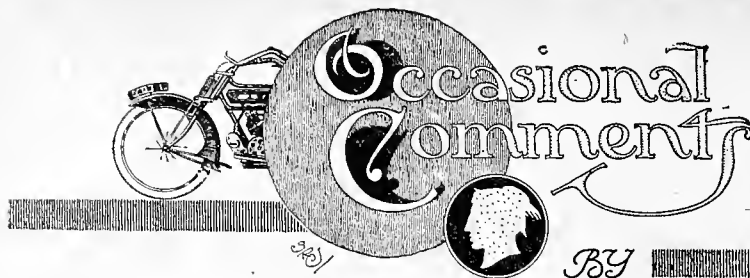
It certainly seems hard that a man, who has carefully studied ways and means, and after much economy and self-sacrifice, has decided that he can just afford to run, say, a sidecar outfit for the benefit of his wife's health (and there are many such), should be compelled, through lack of means, to give up his one hobby when nearly half the time for which he has paid his hard-earned cash has not elapsed. Many a man who is working hard for the good of his country in mine or factory gets only alternate Sundays free, and, supposing he owns a 6 h.p. sidecar, his yearly tax, including driving licence, will be £4 19s. 6d., or 3s. 10d. in tax for every outing, and his petrol tax will probably amount to another 6d. Such a man might well argue in this way, "Why should my neighbour, a well-to-do man of no occupation, ride daily on horseback, as well as riding to hounds, without paying any tax, while I, who can get out but once a fortnight, am compelled to pay nearly £5 and 6d. on every gallon of petrol used?" We confess that we do not know the answer.

Frankly, we believe that a moderate tax on motor cycles would bring in a larger revenue than the excessive rates proposed, which our post bag proves to be beyond the reach of very many, reluctant as they are to give up their weekly or fortnightly trip into the country, at the present moment resplendent in varying shades of vivid green and pink and white blossom. The health-giving properties of such scenes must be worth much to jaded workers or to the wounded from the seat of war.

## A Plea on behalf of the War Worker.

EVERY reader knows the tale of the goose that laid the golden egg. What is very much akin to that allegory is the effect of the rising price of petrol. Petrol kings to-day demand 6d. per gallon on petrol over the amount charged a week or so ago. The spirit most commonly used by motor cyclists now costs 2s. 10d. per gallon, and so the increases may go on *ad infinitum*. But do the clique who are lining their purses realise that they are nearing the limit, and that many users of petrol will be lost to them by overdoing the extortion? Every jump means so many less users—which in itself shows the unfairness of the prices. We make no protest on behalf of "joy riders," what few exist, but we do complain in the strongest possible manner on behalf of war workers, who, with week-ends only to refresh themselves, are faced with unequal obstacles. The health and strength of the nation at this juncture are of vital necessity; soon the poorer motorists will be driven off the roads by exorbitant charges, and will be led to spend their little spare cash in much less healthy pursuits. And the result? Instead of the Chancellor of the Exchequer reaping his estimated increase of £800,000 from motors, he will have watched helplessly the action of our petrol kings in "killing the goose." *Why should not the Government limit the price of petrol?*





BY

LXION

### The Old and the New.

I suppose most riders accept their manufacturers' standard handle-bar without grumbling? I always fake mine more or less, as pedal cycle experience taught me how a few microscopic modifications of the riding position can increase one's comfort enormously. In the old days I used to get a heavyweight to sit in the saddle and help to hold the machine steady, whilst I put my foot against one handle-grip and tugged at the other. A crude method, if you like, but one that recommended alterations of handle-bars to more than one maker. My latest machine has a peculiar handle-bar mounting; the bar is held in two clips fixed to the top of the fork sides, the idea being that the bar cannot turn in the stem when you are wrenching a sidecar round a bad corner. But it has this further merit, that by slackening the grips you can set the bar in almost any position, from the "swallowed-a-poker" to the full T.T. It is true that the angle of the grips themselves would be awkward in several positions, but the range permitted is quite satisfactory, and has saved me from ricking my elderly self in efforts to get the best position. I do not see why the grips should not be screwed into the bar and provided with locknuts; if this addition were made the bar would literally afford a complete range of adjustments.

### Excess of Oil in Two-strokes.

Not long ago I spent an interesting Saturday afternoon watching various touring motor cyclists ascend a rather abnormal hill in the course of their ordinary travel. None of them knew there was a chiel takin' notes at hand. The four-stroke machines performed very creditably, but the two-strokes put up a miserable show with the exception of a Triumph and a Clyno, and in each case faulty oiling methods were to blame, for which the driver bore some of the guilt. Whenever a two-stroke failed, or made a very slow and uneven climb, or experienced anxiety, the rider apparently allowed himself to be surprised by the hill. He suddenly realised that hard work lay ahead, and either opened up his drip valve or injected a pumpful or so, with the result that the mixture was upset by excess of oil in the crank case, and the engine commenced to four-stroke. He then perforce changed gear, and raced his engine to keep up speed, with the result that in several instances oil was flung on the sparking plug points and misfiring set in; in some cases it brought about a total stoppage, in others the points gradually burnt themselves clean, and the rider got up, after his engine and transmission bearings had undergone considerable strains.

### Some Advice.

I should have thought that every two-strokist had learnt by now that the peculiarities of this type of

engine call for extra heavy oiling on hills, but that the extra oil must be given some distance before the grade commences. Two-stroke engines get perceptibly hotter than four-strokes when they are working hard (witness the necessity of water-cooling on 500 c.c. samples), and if they are run for a mile on low gear with a liberal throttle allowance and normal oiling, they conk their souls out and get excessively hot. In other words, oil-cooling must be added to air-cooling when you are climbing a really bad hill. But if a heavy charge is injected, or the drip is opened wide with too great suddenness, the mixture will certainly be upset, and in all probability the disturbance will produce four-stroking. The extra oil should therefore be fed to the engine very gradually, and at some distance from the start of the climb. It will pay to drain out any unconsumed excess at the top of the hill; if I were a designer I should fit my two-stroke engine with a hand-controlled drainer at the pit of the crank case, like that used on one or two car engines. If the surplus oil is allowed to accumulate, carbonisation will be excessively rapid, and dirty plugs will become a common occurrence. There is a world of difference between handling the babies in the undulating Midlands and in the genuinely hilly parts of England.

### One Plug, One Job.

I have written before on the suitability of various plugs to various engines, notably on the merits of thin electrodes in oily engines, because the thin points get so hot that they burn up oil instead of sooting, and of thick plugs for high efficiency engines, because they cool better by reason of their thickness, and so do not get incandescent and pre-ignite. Here is an actual experience to the point. I was driving a high-efficiency twin-cylinder, and was grievously tormented by the plug of one cylinder getting drowned with lubricating oil, and yelling for a clean-up every third or fourth mile. There was no time to investigate the cause of the uneven supply of oil between the cylinders—probably a faulty piston ring, though it must be admitted that many twins suffer from this particular failing. I purchased a cheap old-fashioned plug from a dealer's store, selecting one of the ancient type recently revived in the Ford interest, with 'long, thin electrodes. I was almost ashamed to insert it in place of the 7s. 6d. racing plug, which was oiling up so regularly, but it did the trick; it burnt up the surplus oil as fast as it was deposited, and I was able to finish my journey non-stop. Needless to say, I could not overdrive the engine freely, as the spidery points would soon have turned white hot. Oddly enough, the same plug came in handy next day for similar service on a light car, which was also suffering from one oily cylinder. I shall make a point of keeping one spare of this type about my place.

## ON THE ROAD

WITH A  
POWERPLUS INDIAN

A fast stretch of road south of Dorking.

OUR first ride on the 1916 Powerplus Indian was a very brief affair, consisting as it did of a short run through the traffic, up one of the Hampstead hills, and back again to Euston Road. The combination ran so well, and the new side-by-side valve engine appeared so sweet running and flexible, that we looked forward to an extended trial with this fascinating machine.

The other day, while calling at Maude's Motor Mart, we happened to mention this to Mr. G. Pettytt, and he kindly suggested we should take out a slightly used second-hand combination of this type which he had for sale. Now it is one thing to drive a machine which is the manufacturers' demonstration mount, and consequently always kept at concert pitch, and another thing to take a chance second-hand model from a dealer's show room, as was the case on this occasion, and we were certainly agreeably surprised. This particular Indian was fitted with the Splittorf magneto dynamo, which worked particularly well, and a most luxurious Mills and Fulford sidecar, to which was fitted an excellent Cape cart hood and a Dunhills windscreen with side shields, all of which tended to add greatly to the passenger's comfort.

Our first drive was made to a small village near Aldershot, where we had a business call to make. It was a plain, straightforward run, and presented no difficulties, but it sufficed to demonstrate the excellence of the clutch and the ease with which the change speed could be manipulated. As those who have read the description of this machine may be aware, the clutch has a duplex control, and may be actuated either by the foot or hand. The latter method was seldom employed, as the leverage of the pedal had been well calculated, and the clutch operation was quite delightful on account of the small effort required

to withdraw it. Many American machines need the clutch to be not absolutely in engagement to prevent "snatching," but with the Indian this was unnecessary, as the drive was at all times quite smooth. It was in acceleration and hill-climbing that the machine particularly excelled, and owing to the splendid balance of the engine, which was as good as one could expect in a V twin, it was delightfully smooth running. We were also much interested to note the absence of valve clatter, which was due to enclosing the valve stems and guides and the abandonment of the overhead inlet valves.

During the journey just referred to the most noteworthy performance was the climbing of the Hog's Back on top in the teeth of a south-westerly gale; the engine pulled magnificently, tackling the steep portion in excellent form and picking up rapidly when the gradient eased. Both on this occasion and on the next day we were particularly impressed by the cool running of the engine and the total absence of any knocking under any circumstances. Much bad road surface was traversed on both days, when the springing of

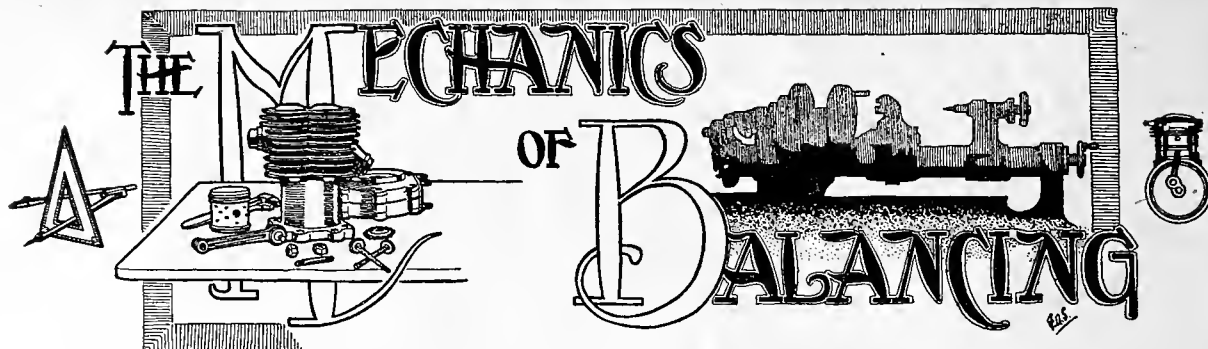
the frame was much appreciated. The climbing of Reigate Hill on top speed was another feat which excited our enthusiasm.

So far we have dealt only with the good points of the machine. To say that there was no fault to find would be an exaggeration, but we purposely refrain from the other kind of criticism, as the machine did not belong to the maker's London house. We may say frankly, however, that there was little with which we could find fault. Our second day's run was made in heavy rain, which, we are happy to state, in no way affected the ignition or lighting systems. Altogether we were most favourably impressed with the Powerplus Indian.

## POWERPLUS FEATURES.

7 h.p. Twin-cylinder Engine.  
79 x 100 mm. = 990 c.c.  
Side-by-side Valves.  
Three-speed Countershaft Gear.  
Spring Frame.  
Dynamo Lighting.  
Mechanical Pump.

Fully described in "The Motor Cycle"  
of October 21st, 1915, page 394.



By H. ADDISON, B.Sc., A.M.I.C.E.

IN THREE INSTALMENTS. (The first appeared in the issue of May 4th, page 422.)

**P**ERHAPS the conclusions reached in the preceding article will be more readily understood in the graphic form shown in fig. 3, in which the actual values of the inertia forces are given for various positions of the crank pin. They have been calculated, by means of the formulæ already put forward, for an engine in which the weight of the reciprocating parts  $W=1\frac{1}{2}$  lb., crank radius  $R=1\frac{1}{2}$  in., speed  $N=1,800$  r.p.m., and length of connecting rod  $L=7\frac{1}{2}$  in. At the top of the stroke, fig. 3 (a), the primary force  $P$  has a value of 169 lb., and the secondary force  $S$  has a value of 34 lb. After the crank has moved through  $45^\circ$ , fig. 3 (b), the corresponding figures are 120 lb. and 0 lb.; at the half centre, fig. 3 (c), the primary force has diminished to zero, while the secondary force now acts downward with an intensity of 34 lb.; and so on. It should be explained that all these forces act through the centre of gravity of the reciprocating mass; they are shown offset in the diagram merely for the sake of clearness.

The net inertia force transmitted to the motor cycle frame is, of course, the result of the primary and secondary forces; thus, the total upward inertia force at the top of the stroke  $P_T$  is in this case  $169+34=203$  lb., and the maximum downward force at the bottom of the stroke  $P_B$  is  $169-34=135$  lb. In simpler language, at the top of each stroke there is a force of 203 lb. tending to lift the motor cycle bodily off the ground, while at the bottom a downward force of 135 lb. comes into play. These figures demonstrate in striking fashion the vital importance of making every effort to reduce the inertia effects, and of balancing them if at all possible.

#### A Popular Fallacy.

In view of the misconception which appears to exist on this point, the present opportunity may be taken

of emphasising a fact which has hitherto been taken for granted, viz., that the inertia pressure is absolutely independent of the gaseous pressure in the cylinder. Since the inertia force depends solely on the acceleration of the reciprocating parts, its intensity for a particular crank position will be precisely the same on the suction stroke as on the explosion stroke, on the exhaust stroke as on the compression stroke, and whether the throttle is closed or fully opened, *provided* the engine turns at the same speed in each case. Similarly, from the point of view of balancing, a two-stroke engine is on exactly the same footing as a four-stroke, other conditions being equal.

#### Balancing a Single Cylinder.

We are now in a position to consider how, and to what extent, the inertia forces can be counteracted. In the single-cylinder engine the only method available is to use a revolving balance weight; this must obviously be situated opposite the crank pin,

and the question then remains as to how heavy the weight should be to give the best results. Let us first try the effect of a weight whose centrifugal force would just balance the maximum upward inertia force  $P_T$ . For clearness we will use the values of  $P_T$ ,  $P_B$ , etc., obtained above for an engine running at 1,800 r.p.m. At the top of the stroke, then, the upward inertia effect being 203 lb., perfect balance would be attained if the balancing mass exerted a centrifugal force of 203 lb. (see fig. 4 (a)). This state of affairs would only be momentary, however; the balance would be upset immediately the piston commenced to move, and by the time the crank pin had reached the half centre we should have the full centrifugal force of 203 lb. acting horizontally, quite unopposed. In other words, the balance weight itself would now be "unbalanced," and there would be a horizontal force at work on the motor cycle just as severe as the inertia force we are endeavouring to neutralise (fig. 4 (b)). The engine

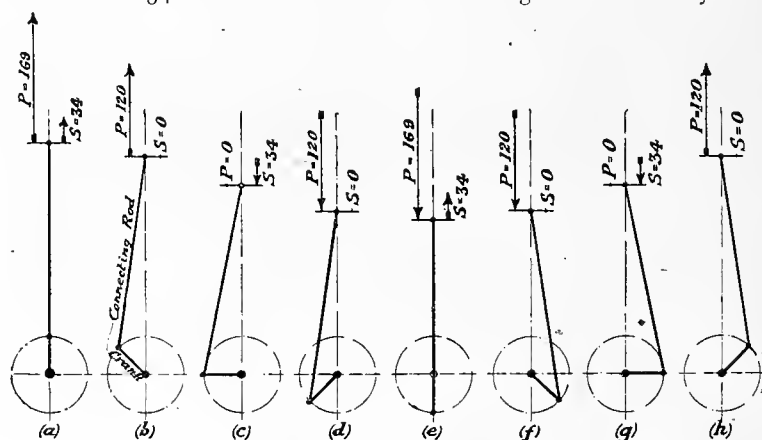


Fig. 3.

**The Mechanics of Balancing.—**

would also be out of balance at the bottom of the stroke to an extent of 68 lb. (fig. 4 (c)).

**The Best Compromise.**

A much better result will be attained if only *half* the maximum inertia force is balanced (fig. 5 (a)). The balance weight will then be required to exert a centrifugal force of about 101 lb., leaving an unbalanced force at the top of the stroke of the same amount, *i.e.*, roughly 101 lb. At the half centre (fig. 5 (b)) the unbalanced force will still be 101 lb., and a little reflection shows that this is very nearly the best, or, rather, the least unsatisfactory, compromise that is possible. Such a figure as it stands would appear to justify the phrase, "the horrible unbalance of a single-cylinder engine"; but the many thousands of single-cylinder machines giving perfect satisfaction on the road show that a comparatively large unbalanced inertia force does not produce the ill-effects that might be anticipated.

**The Rider's Point of View.**

Although balancing on the system outlined above reduces the unbalanced forces to a minimum, it does not necessarily follow that the vibration set up in the motor cycle frame will also be brought to its lowest point. It may happen that the frame is more susceptible to vibration in one direction than in another; for example, a small unbalanced force acting in a vertical direction may set up serious vibration, and render the machine uncomfortable to ride, whereas a much greater force acting horizontally would produce a negligible effect from the rider's point of view. Whether or not this is the case can only be determined by experimenting with different balance weights; in the instance just cited the balance weight which gave the best results as regards absence of vibration would be found to be heavier than that which ensured the least unbalanced force.

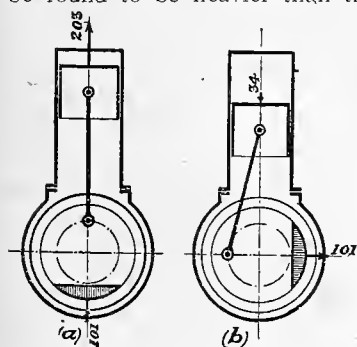


Fig. 5.

**Balancing a V Twin Engine.**

As is pretty generally known, the 90° V twin engine can be comparatively well balanced, but as the angle between the cylinders diminishes, the balance becomes

less and less satisfactory. These facts admit of quite a straightforward explanation. Dealing first with the 90° type, the reason for the high degree of balance obtainable in this engine is made clear in the diagram, fig. 6. As a matter of fact, the primary forces can be

completely balanced, and the only unbalanced effects are the secondary ones due to the obliquity of the rods. Neglecting these latter, we know that when the back piston is at the top of its stroke, and is consequently exerting its maximum upward inertia force P, the front piston is at mid-stroke, and is therefore responsible for no primary inertia effect. A balance

weight can hence be placed opposite the crank pin, which will ensure perfect balance at this point (fig. 6 (a)). After a quarter of a revolution the front piston now exerts its maximum effect, while the primary force due to the back piston has fallen off to zero (fig. 6 (b)); but as the balance weight has also moved round through 90°, complete balance exists in this position too. A similar state of affairs holds good when the pistons are at the bottom of their respective strokes, and a simple geometrical proof will demonstrate that at any intermediate position the combined primary inertia forces of both cylinders are entirely counteracted by the centrifugal force of the balance weight. There is, however, no means of balancing the secondary forces; indeed, in no class of engine is it possible for these forces to be neutralised by a rotating balance weight.

**Effect of Reducing the Angle between the Cylinders.**

Coming now to engines in which the angle between the cylinders is less than a right angle, these may be regarded as being intermediate between the single-cylinder type and the 90° twin. It requires no great stretch of the imagination to consider a single-cylinder engine as being really a twin in which the angle between the cylinders is 0°; at any rate, this is quite a rational supposition as far as the inertia forces are concerned. From this it follows that if the cylinders of a twin are set at a small angle, the engine will behave, as regards balancing, more or less like a single, but as the angle increases its behaviour will more and more resemble that of a 90° twin.

The precise manner in which this variation takes place is shown graphically in fig. 7, in which the unbalanced force (or, more briefly but less elegantly, the

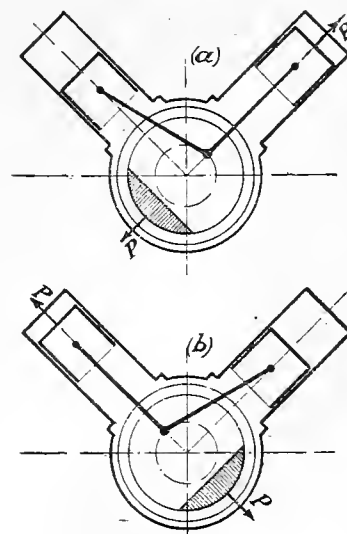


Fig. 6.



**The Mechanics of Balancing.—**

"unbalance") is plotted vertically for different angles. It will be observed that when the angle between the cylinders is  $40^\circ$ , the unbalanced force or "unbalance" has the value 0.97. As the angle increases, the unbalanced force diminishes rapidly; thus, at  $50^\circ$ , it is 0.82; at  $60^\circ$ , 0.66; and at  $90^\circ$ , 0.28. Comparing a  $90^\circ$  twin with a  $50^\circ$  machine, then, we find that the unbalance in one case is only about one-third of what it is in the other, or, expressed in another manner, the balance of a  $90^\circ$  engine is nearly *three* times as good as that of a  $50^\circ$ .

As for the exact value in lbs. of the unbalanced force, this can at once be determined when it is explained that the decimals in fig. 7 represent fractions of the maximum primary inertia force  $P$  of one set of reciprocating parts. For instance, if,

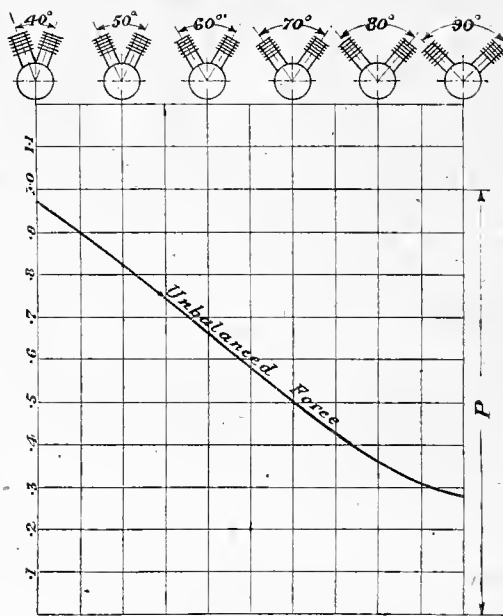


Fig. 7.

at a given speed,  $P$  is found from the formula already quoted to have a value of 95 lb., then the unbalanced force in a  $90^\circ$  engine at that speed will be  $0.28 \times 95 = 27$  lb., or in a  $50^\circ$  it will be  $0.82 \times 95 = 78$  lb. It may be added that these figures represent the maximum unbalanced forces still at work after the engine has been balanced as thoroughly as is practicable by the use of a revolving balance weight. The values given are only the theoretical ones, and, as has been pointed out before, it does not necessarily follow that they will agree with the results that experience has shown to be most satisfactory. The only other comment called for is that the curve (fig. 7) has been calculated on the assumption that the connecting rods are equal to five crank lengths.

(To be concluded.)

## PISTON TAP OR WHAT?

### Explanatory of the Peculiar Tapping noticed on some Twin Machines.

**B** EING a big twin enthusiast I was naturally keenly interested in a discussion which I overheard being carried on recently between some half dozen keen twin riders relating to a problem which had often puzzled me and many of my friends with several big V twin machines which I have owned from time to time. The discussion commenced by the rider of a new 7 h.p. chain driven American mount asserting that his machine was not wearing well, as already, after only two or three hundred miles, he could hear the distinct "tap, tap," of a worn big or little end. On first hearing the noise he had thought it was a tappet which had become unadjusted. Upon examination, however, all the tappets were found to be in perfect order. Then the argument began.

Everyone was convinced the trouble was not ordinary wear: they had all experienced this little peculiarity in various big and little V twins which they had owned, and although they could assure the new owner that the trouble was not due to big or little end wear, their opinions as to what was the real cause and remedy were decidedly at variance. It is just possible that the various opinions and remedies given may be of interest, and some may be of value to readers who have also experienced this apparently harmless, though to some riders particularly irritating, trouble.

#### Insufficient Lubrication.

One rider was assured by the makers of his big twin that the tapping he heard was due to insufficient lubrication of the front cylinder. He accordingly dismantled his engine, and arranged two metallic scrapers at the base of the cylinder in such a manner that they scraped the film of oil from the flywheels and directed it into the orifice of the front cylinder.

This improved matters to a certain extent, but the tapping frequently recurred after a stretch of hard driving all out. He accordingly then fitted an auxiliary oil feed to the rear wall of the front cylinder. This, he asserted, entirely disposed of the irritating symptom, and conclusively proved from his point of view that the tap was entirely due to lack of lubrication.

Another rider who had experienced the tap in both single cylinders as well as twins after fast driving was convinced that the noise was due to distortion of the cylinder due to excessive heat, probably caused through insufficient lubrication, and that the only remedy was a new cylinder and piston.

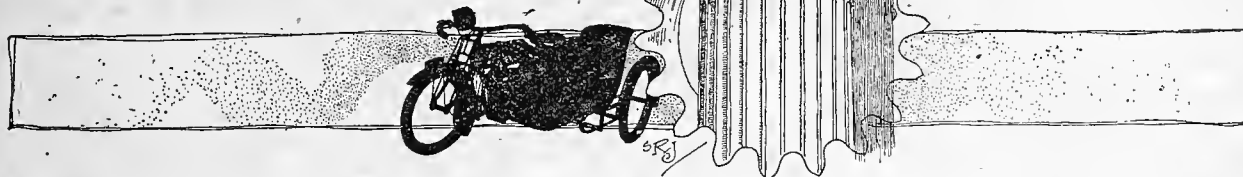
A third attributed it to the slack fit of the front piston, done intentionally by some manufacturers in order to compensate for the extra heat generated in the front cylinder due to insufficient lubrication—a trouble from which practically all V twins suffer.

#### Unequal Sparks.

Another suggested it was the construction of the armature of the magneto, it being almost impossible to produce two sparks of equal intensity with the staggered armature necessary to ignite two cylinders set at an angle, and so in order to overcome this the front cylinder was caused to ignite earlier, which sometimes, especially when running under heavy load, caused the slight knock. This theory is rather knocked on the head by the fact that many riders have experienced the same peculiar tap on a single cylinder machine, especially where the cylinder is not vertical, from which it would appear that the inclined cylinder is to some extent responsible for the trouble. Other readers' experiences and opinions on this matter would be of interest.

TRIALS RIDER.

# THE RISKS OF IMPERFECT ALIGNMENT



At least ninety per cent. of the machines seen on the road this Easter were of the family sidecar variety, ridden for the most part by elderly men with their families aboard, and the entire absence of speedy solo mounts was one of the most striking signs of the times. It is usual to see quite a large number of outfits during such seasons which are incorrectly adjusted in one way or another, but it would seem that the grey heads of the pastime who now reign supreme are the very worst sinners as regards the alignment of their sidecars. Never before have I seen so many outfits being ridden at perilous angles, so far as vertical alignment is concerned, as this Easter, and it would seem that many family men are so harassed by the thought of the sidecar-lifting that they attempt to lessen the likelihood of such mishap by taking risks of a far more potent kind.

## The List to Port.

I refer to the risk of broken couplings when the outfit is run with the machine leaning in towards the sidecar, and this risk is very much enhanced when a passenger is mounted on the carrier. The lean on several machines I saw made one shudder to behold, and in some cases was so considerable that it clearly required a good deal of energy on the part of the rider to hold the machine to its course when on the left camber of the road. I noticed a 6 h.p. twin outfit carrying a 14 stone rider, and with a 12 stone pillion passenger, and the lean was so great that the unfortunate couplings could actually be seen to yield on taking a right-hand corner! And this is the class of rider who gives his make of machine a bad name among his neighbours if anything finally breaks.

## A Simple Illustration.

The subject is not new, but let us approach it in a different way with a view to demonstrating the excessive strains that take place when an outfit is ridden with the machine leaning inwards.

Fig. 1 represents, for the sake of convenience, an improperly aligned sidecar outfit viewed from the rear. A C is the motor cycle, B C the axle tube of the sidecar chassis, and A B the torque tube between the chassis and the saddle pillar. The circle at A represents a weight of 20 stone, this being the weight of the rider and pillion passenger, and the

curved line below the triangle is a section of the road surface.

It will be seen that since A C, which represents the motor cycle, leans towards B, the centre of gravity falls to the left of the point C. In other words, the curved torque tube is at all times supporting a certain proportion of the weight which would fall direct upon the rear wheel if the motor cycle were vertical.

Fig. 2 shows what happens with the machine in its normal position on the left camber of the road. The strain on the torque tube is then very much increased, the vertical arrow indicating the centre at which the weight falls. Now imagine the enormous strains which must take place when an outfit arranged thus takes a right-hand corner on the left camber of the road, as it inevitably must do several times during a day's ride. The entire weight of the two riders and much of the weight of the machine is then thrown in the direction indicated by the horizontal arrow, and there is very

little to resist it except the torque tube A B and the rigid attachment at C. The torque tube being (in all probability) curved, is bound to yield to some extent, and the attachment at C is then subjected

to a very considerable breaking strain, which it is badly placed to resist.

## Correct Position.

To what extent these strains are reduced if the outfit be set as shown in fig. 3 is clear at a glance. With the machine in its normal riding position, the weight of the rider and passenger then fall dead on the centre of the rear wheel, and the torque tube is normally idle. In taking a right-hand corner (even though one be forced into the gutter) the pressure placed upon the torque tube is considerably less.

There is but little to be gained in safety by leaning the machine towards the sidecar, while incorrect alignment causes excessive tyre wear and increased fuel consumption. Sidecars of the family type do not lift on corners if handled with any degree of sanity, while the danger of a broken chain stay coupling, or of a torque tube suddenly buckling, is serious. H.M.B.

The record of 2h. 15m. 20s. for the 90 miles circular trip round the island of Oahu, Hawaii, has been lowered by a Harley-Davidson rider.

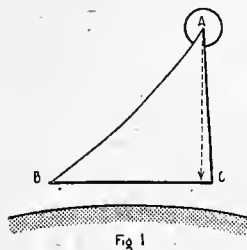


Fig 1

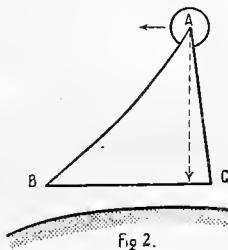


Fig 2.

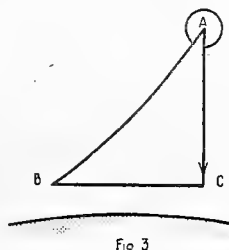


Fig 3

# THROUGH FEMININE GOGGLES.

## THE LADY ANGLER AND HER MOTOR CYCLE.

**M**OTOR cycling seems far removed from the dreamy, abstracted sport of angling, but a motor bicycle and sidecar is the "magic carpet" which deports the angler from home to the fishing waters in the minimum time. No sport so solitary, therefore no sport so restful—fishing is the one pastime in which one can pleasantly indulge without human companionship. I was invited lately to a day's pike fishing by a lady who is never so happy as when, with line cast, she watches the float on the gently

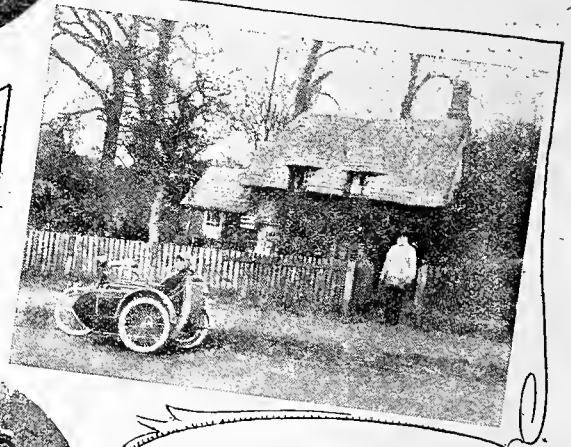
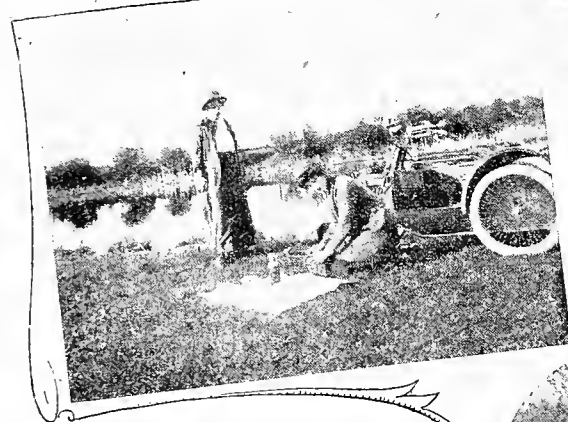
climb Sundon without resorting to bottom gear appealed to my tastes—if I dare admit the fact—far more than an afternoon spent in capturing one tench, and a small one at that.

Our first duty on reaching the happy hunting ground was to interview the farmer-owner of the lake, and pay the 1s. each person is charged for the right to try one's luck—or skill. Fish in plenty could be seen bobbing to the surface, but they were too cute to be had, "on toast," and one had ample time to

Welcome arrival of tea.

Throwing the line.

The owner of the lake.



rippling surface. The day was ideal and the sun overcast as we left the main road at Dunstable, then through Houghton Regis and Toddington to the Harlington Lake, which is famed in Bedfordshire for its power to provide a good day's sport with the rod. The local hills encountered were as level ground to our J.A.P.-engined combination, and to the driver the journey was all too short for a morning spin. My inclinations were to visit Sundon Hill, close by, and try the capabilities of my mount. To

Ready for home.

study the picturesque scene, with the grand array of bulrushes and water flowers.

At the close of the day—I felt that, with all the charm of the water and of being alone with nature, I still could not quite comprehend my companion's pleasure in the "gentle art."

For me—ah!—the open road, and the well-known mount, and

the days of no fear about waste of petrol! But tastes vary, and there is no doubt that fishing appeals to many.

MAY WALKER.

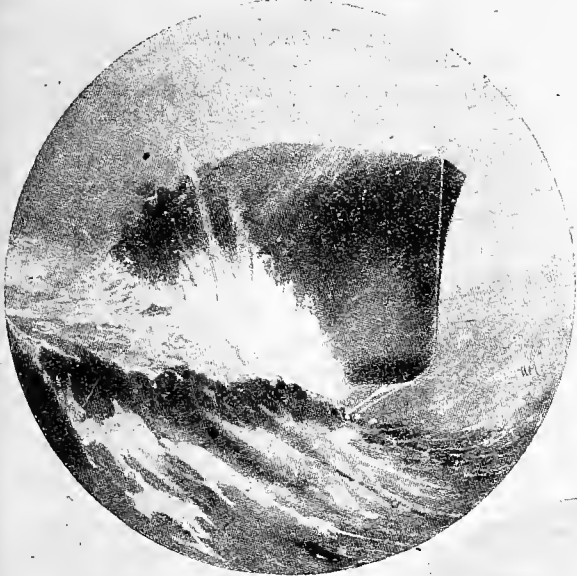
## MOTOR CYCLES IN THE MEXICAN CAMPAIGN.

**J**UDGING by our Chicago contemporary, *Motor Cycling and Bicycling*, the great source of trouble with the motor cycles attached to the United States force operating against Villa is the lack of good riders. The desert tracks have caused their share of trouble, but the average man put in charge of a U.S.A. military motor cycle appears to be an absolute "dud." One would have thought an appeal for expert motor cyclists to act as despatch riders for the duration of the campaign would have resulted in better service

being obtained from the machines that the U.S.A. military authorities have recently purchased. There are thousands of keen, young Americans who would jump at the opportunity. The Mexican dogs appear to be very plentiful and a great nuisance. All the Mexican Indians have quite a fleet of them. "Shut your eyes and hurl a brick in any direction around Colonia, Oublan, or Casas Grande, and you will hit a dog once in three shots. The average of the motor cycle despatch rider is a good deal better than this."

## PEACE—AND WAR!

ONLY a few days ago I was steadily wending my way across the summit of the Sussex Downs. Having no need to hurry I paused once or twice, propping up my motor cycle the while, to gaze upon



the magnificent views stretched out before me. From one point a small section of railway could be easily distinguished, its course zigzagging like some gigantic snake away towards the coast, the latter stretching out like some exaggerated portion of an ordnance map to east and west. Then in the distance the blue hazy mist spake of the sea, which in appearance was almost summerlike on this beautiful April day. Remounting, "we" proceeded further inland, halting halfway down the steep sloping road that leads to Poynings, that fascinating little village at the foot of the Downs which is a feature of A. E. W. Mason's "Broken Road."

### "Sussex by the Sea."

"We"—there are some who dare suggest that there is no sympathy between man and motor cycle—always make a point of halting at this spot when in the Sussex highland district to admire the village just mentioned, and also to gaze in admiration at the rolling Downs, of which the highest point in Sussex—Crowborough Beacon—is such a prominent feature.

Having partaken of as much of our fill—one can never have too much of this kind of "stuffing"—as

time permitted, "we" "carried on" through Fulking, continuing along the road running 'neath the foot of the Downs until Shoreham and the sea were reached.

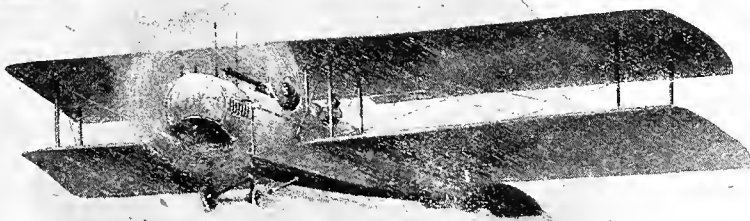
One moment, gentle reader. Have you thought why I should mention the sea here? Probably you never thought about it. Well, somehow the sea reminded one again of the "horror"—the horror that is affecting us all in some way or another. Is there need for further explanation?

### Reminiscences.

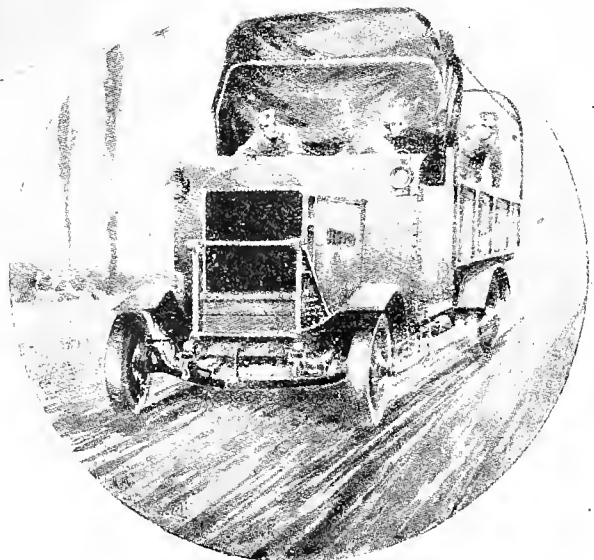
Half an hour ago it would have been hard—tremendously hard—to consider that across that blue strip of water part of the largest fight the world has ever seen was taking place, as we paused and gazed admiringly on the quiet, peaceful scene before us, but even up there one glimpse of the ocean was enough to remind one that only a few months ago one was in the midst of the horror itself.

Only the previous day "we" had another jaunt through leafy Sussex to a snug little cottage nestling 'neath another portion of the same range of Downs. There the writer took tea amidst the most peaceful surroundings imaginable. "We" were on a long-promised visit to a friend there to re-tell the tale of a despatch rider's life in

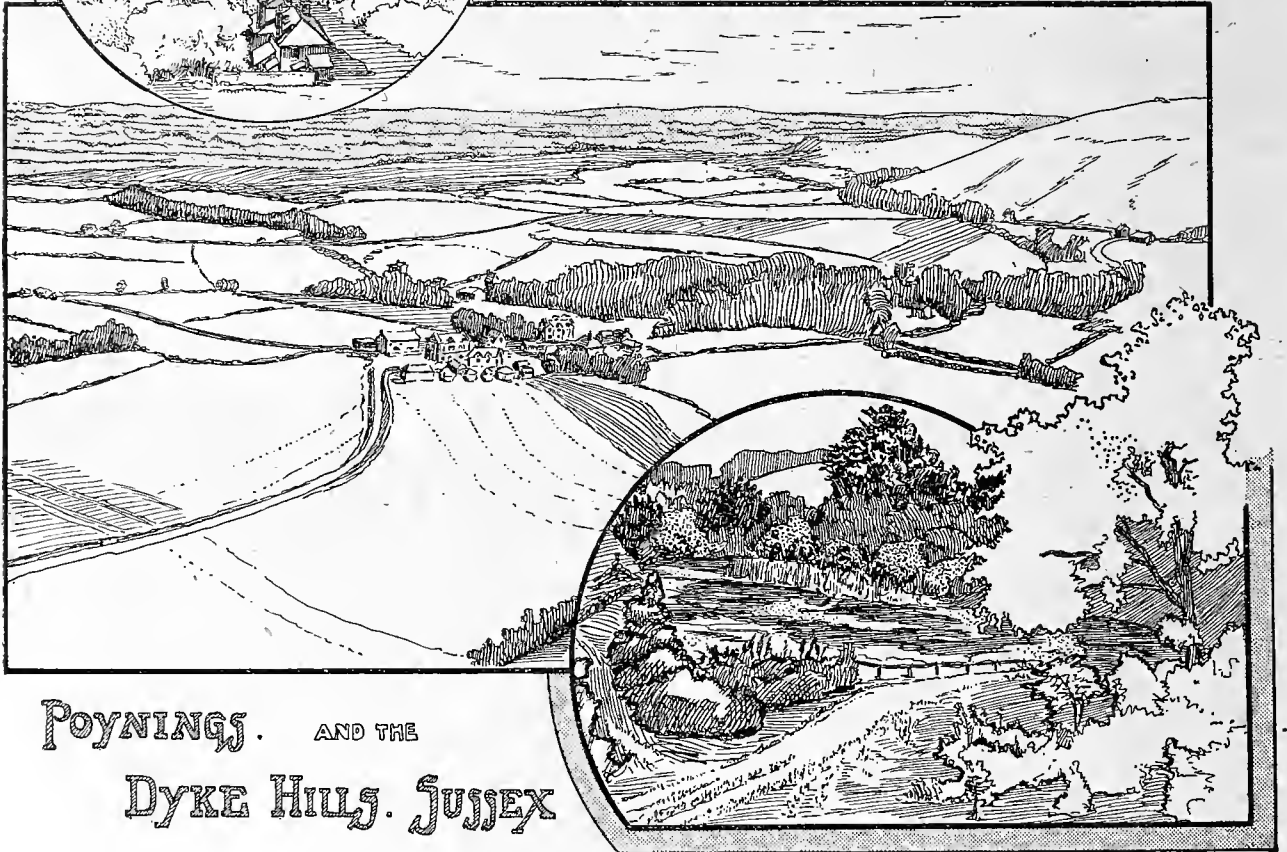
WHAT MOTOR CYCLISTS ARE DOING  
IN THE WAR, BESIDES DESPATCH  
RIDING AND SERVING IN LINE  
REGIMENTS.



(Top) A motor boat patrol.  
(Centre) Aeroplane pilot.  
(Bottom) Mechanical transport driving.







## POYNINGS. AND THE DYKE HILLS. SUSSEX

Northern France and Flanders. Once again "we" were plunged in the midst of war, surrounded on either hand by a perfect peace. Thus on two successive days has war been brought back to me, though far from the madding crowd.

### Other Scenes.

Now comes the other side of the picture. It all comes back again as one writes—scenes one has witnessed of wrecked and ruined homes, the practically totally destroyed Cloth Hall and Cathedral of Ypres, the bombardment of Dunkirk, roads teeming with homeless and helpless refugees trudging seemingly ever onward to God knows where.

As one writes a scene such as that described returns vividly to the mind without effort. These things seem to be photographed on the brain of those who come upon them suddenly and without warning. Along a certain highway "somewhere in France," consisting

of dust-strewn *pavé*, running alongside the bank of a canal, terminating eventually in the heart of the horror itself, we—another mount then—carried our messages. One day we noticed a goodly portion of the population of — coming in an apparently never-ending stream towards us. The reader may guess the meaning of that congregation. Homeless! One word will suffice to sum it all up. It appeared as though the enemy knew where those homeless civilians were directing their weary footsteps, thereby tracking them down, for the writer heard later that the town they were making for was also bombarded with 17in. shells shortly after.

Many other and practically everyday sights could one write of dealing with life "over there," but this one sample will suffice to show the different aspects of life which I have witnessed during the last few months where apparent Peace and real—terribly real—War reign supreme.

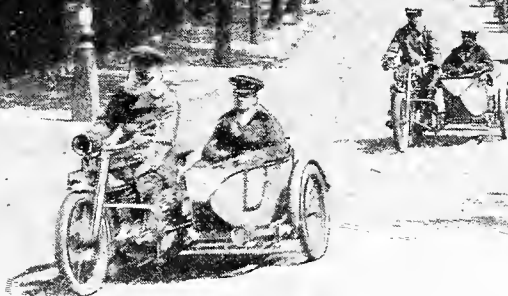
R. L. NYE.

The taking of, among others, the photographs that appeared in our last issue of scenes in Dublin immediately after the rebellion led to the arrest of the photographer, our regular Irish correspondent. Luckily he was only detained by the military authorities for about an hour.

**ECONOMY  
AND  
UTILITY**

The title of a Special Number of  
"THE MOTOR CYCLE,"  
to be published on Thursday,  
June 29th.

## HEALTHY RECREATION for WOUNDED SOLDIERS



THE second sidecar outing for wounded soldiers, organised by the Harley-Davidson Co., took place on Saturday last. As before, the wounded came from St. Thomas and the City of London Hospitals—two up-to-date institutions which have recognised the value of the sidecar for this particular purpose. In our report of the first event of this nature, organised a few months ago, we were justly enthusiastic over its success, and it was then impossible to imagine that any similar outing could be more successful, but so it happened, not owing to any greater forethought and kindness on the part of the organisers, nor of the splendid band of helpers, but on account of the perfect weather which prevailed. It was simply glorious; there was just enough southeasterly wind to temper the scorching noon-day sun, and the country in its fresh spring green looked its very best. The organisation at the start was perfect, the machines turning into the hospital drive and taking on board first the worst cases, so that the poor fellows need not walk a step further than was necessary, while the others walked down the line and found themselves seats. There were forty-two wounded men in sidecars and a few in cars as well, so the procession when it started punctually at 12.30 was a most imposing one.

At the start, splendidly arranged by Mr. Duncan Watson, the drivers and their passengers had to face a regular battery of kinematographs and cameras, and then in Indian file threaded their way across Westminster Bridge and along the Chelsea Embankment. Practically perfect order was kept, the only scorches being the photographers who rushed ahead to get pictures at different vantage points. Our passenger was one of the few who had taken part in the first outing, of which he could not say enough

in praise. He had been wounded in September, had had eight months in hospital, and between the two outings had had an operation.

### A Pleasant but Uneventful Journey.

The journey down was without incident. Once near Roehampton we slowed down to oblige the kinema man, but most of the time we kept among the first ten, who were led by Mr. Duncan Watson, himself driving a sidecar combination. There are too few managing directors of important motor cycle firms who drive their own machines. There was only one fault to be found, and that was that too close order was kept in the column, so that the passengers and drivers had to suffer too much dust at times. Only one sidecar driver, as far as we were able to gather, arrived late owing to a puncture, but one of the two or three cars was badly hung up owing to tyre troubles, and several of its passengers were brought up in sidecars which went to their rescue. The soldiers were one and all delighted with their drive. We heard one telling a friend with great delight that his photograph had been taken while he was trying to wipe his dusty face by the aid of his driver's handle-bar mirror.

Lunch of a good simple type, and plenty of it, was served in an iron room, passengers, drivers, and officials numbering some 125 in all. It was made as short as possible, and then all went out into the beautiful grounds of the Burford Bridge Hotel, and sat on the lawn and listened to talented artists, who sang just the right kind of songs.

### "Sweet are the Uses of Advertisement."

The concert began by all present singing the National Anthem, those of the soldiers who could stand at attention. Then, after one or two excellent musical

turns, Mr. Watson spoke a few words of welcome. He told the soldiers that it was their day, and he hoped they were enjoying themselves. They owed a great deal to the drivers who had so loyally responded to the call for their services. Opposite him at lunch had sat a young Scottish warrior who on the occasion of the last outing had been in bed; though operated on last Wednesday, he had got out of bed this morning, determined not to miss this outing for worlds.

A cynic would say that all this was done for advertisement. Now advertisements were of two kinds, good and bad, and he hoped this would be a glorious one, and that all others similarly placed to himself would vie with one another to give wounded soldiers as good a time as possible. He mentioned that the Chairman of the Auto Cycle Union, Mr. Otto Thomas, was present to give an official tone to the gathering, and also members of the motor cycle press; to them also he extended a hearty welcome.

Sgt.-Maj. Thorogood replied on behalf of the soldiers in a few well-chosen words. There was only one thing, he said, harder than making a speech, and that was convincing a woman she was wrong. (Laughter.) This had been the best day he had ever had, and on behalf of his fellow soldiers he expressed his heartfelt thanks, and called for cheers for the organisers and the drivers.

### The Intentions of the A.C.U.

Mr. Otto Thomas (*The Motor Cycle*), chairman of the A.C.U., was called upon to say something on behalf of the body he represented. He began by referring to the debt of gratitude due to the brave soldiers who had suffered in the cause of King and Country, and went on to say what a splendid example Mr. Duncan Watson and the Harley-David-

**A Sidecar Outing for Wounded Soldiers.—**

son Motor Cycle Co. had set. The Auto Cycle Union had the interests of soldier motor cyclists at heart, and would do its part to see that those who suffered in the war were not left unemployed. The A.C.U. would endeavour to see that work would be found for all who had been in the industry. An organisation with this end in view was actually in existence, a committee of the Royal Automobile Club having been formed for this purpose. The soldiers present should keep this fact in mind and tell others of it, as it was not intended to let those who had fought for their King and Country live on the charity of the nation or die of want, as had happened years ago after the Crimean War.

Before the concert cigarettes and matches were given to the soldiers by the Harley-Davidson Co. During the concert Miss and Master Watson gave each wounded man a box of cigarettes, and in each box was a card wishing the recipient good luck and a speedy recovery, from the proprietors of *The Motor Cycle*. An interested spectator was Sir Hugo de Bathe, husband of Mrs. Langtry, who is the rider of a Harley-Davidson. During the afternoon he handed Mrs. Watson a handsome bouquet of flowers, subscribed for by the soldiers. During tea boxes of chocolates were distributed to the soldiers by Mr. Watson's children.

On the way home our passenger told us that he had been a turner in the general



Leaving hospital.

engineering trade, and that he was just on the point of joining a motor business when war broke out, so we told him that when he received his discharge we would use every endeavour to find him work.

All arrived back at the hospital having thoroughly enjoyed their day, and most of the outfits arrived in good time, only a few being delayed by punctures.

**Notes.**

Two lady artistes who had performed at the open air concert worked indefatigably afterwards by waiting on the soldiers during tea on the lawn.

After the concert, while tea was being prepared, and during the meal, one of the wounded *souvenired* the piano, and played rollicking ragtime tunes, which were heartily applauded.

When the London police on point duty saw the long line of sidecars threading their way through the traffic they quickly rose to the occasion, and whenever possible the procession was allowed a clear road. The official car was caught in the police trap in Roehampton Lane.

W. Cooper made an excellent suggestion to the effect that the Motor Cycling Club might organise a similar outing. We heartily agree, and would give the club every help in our power.

Before starting, every driver was presented with a couple of Union Jacks, which he attached to his machine. The organisers knew their business, and everything was well done.

An impressive incident was when drivers, guests, and officials formed a circle on the lawn, crossed hands, and sang the old Scottish ballad, "Auld lang syne."

**MILITARY NOTES.****AN OLD CAMPAIGNER.**

**F**RANK P. MAYELL, before the war, was known in Midland motor cycling circles by reason of his being captain of the Sutton Coldfield and Mid-Warwickshire A.C. Upon the outbreak of war he joined the Warwickshire Yeomanry, with which regiment he had served through the South African campaign, and he is now in Egypt. Readers who know Mayell will be glad to hear he is very fit, in spite of seeing service on the Gallipoli Peninsula, and taking part in a more recent scrap east of the Suez Canal.

**CANADIAN MILITARY NEWS.**

**A**CCORDING to a Toronto correspondent, Lt.-Col. Robert Starke, of Montreal, in command of the McGill Contingent, Canadian Officers' Training Corps, has arranged for the raising of a motor cycle machine gun and despatch riders' section of the corps, to consist of 150 men. The motor cyclists will carry out their preliminary training at the Champ de Mars, a local parade area, and later will take part in extensive tactical exercises.

Capt. Thom, Divisional Signalling Officer, Montreal, has also issued a call for about twenty-five motor cycle riders for home service. Four or five

will be allotted to each of the local home regiments, and the men will participate in field manoeuvres this summer. The riders will be trained as signallers and scouts. They will constitute a training depot for overseas despatch riders.

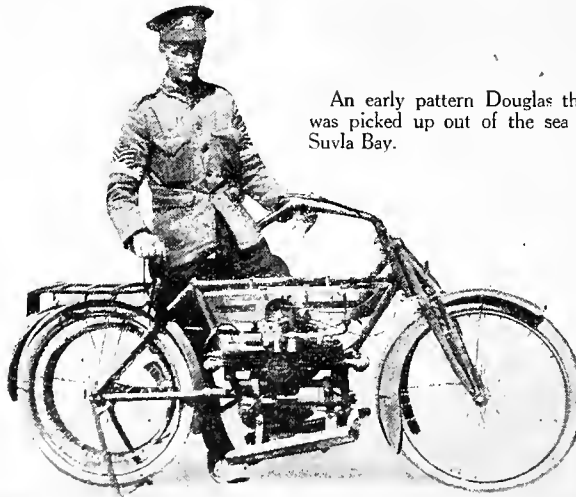
**A MOTOR CYCLE WITH A HISTORY.**

**I**T is not possible to write the full story of the early pattern Douglas illustrated on this page, for the reason that details of its early days are at the

moment lacking. The knowledge that is available, however, shows that the machine in question has had a career very different from that usually followed by the average motor cycle. This old stager, which is still running well, was picked up out of the sea at Suvla Bay, Gallipoli. It is believed that an officer took it out with him. It was brought back to Alexandria, and left in the workshops. Here Cpl. H. J. Batley, R.E., who sends the photograph, found it, and he tells us that, though rusty, it started with no trouble when the attempt was made.

Cpl. Batley is quite an old stager, so far as this war is concerned. He joined the despatch riders in the early days, and was attached to a cavalry division in France until twelve months ago, when he was wounded. After eleven weeks in hospital he returned to France, and was quartered at an advance base, when injuries to his right arm caused another five weeks in hospital. Batley then joined an R.E. training depot in the South Midlands, when he was sent to Egypt to look after a Douglas wireless set.

Harold Karslake, who joined the R.F.C. some time ago, is now a flight sergeant (technical).



An early pattern Douglas that was picked up out of the sea at Suvla Bay.

# "THE MOTOR CYCLE" RECRUITING SECTION.

Central Office for Heavy Section, Machine Gun Corps and Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

THE Heavy Section, Machine Gun Corps, has lately been gazetted. Recent recruits have been allotted to this armoured car section, and more men are still required, though it cannot now be stated how long recruiting will remain open. The conditions of enlistment are precisely the same as for the Motor Machine Gun Service, which latter section is another branch of the Machine Gun Corps. A few men with engineering knowledge, who are neither car drivers nor motor cyclists, can be accepted for the Heavy Section.

A limited number of experienced motor cyclists and car drivers, able to execute running repairs are also wanted for the Motor Machine Gun Service.

At Coventry last week there was the usual crowd of motor cyclists and car drivers from all quarters. North countrymen flocked to Manchester on Wednesday, and in a busy afternoon fifty men were examined and the majority accepted.

Next week's inspections of recruits for the Heavy Section, Machine Gun Corps, are as under:

COVENTRY.—Recruiting Office, Masonic Buildings, Tuesday, 30th inst., 11 a.m. to 4.30 p.m.

LONDON.—The Motor Cycle Offices, 20, Tudor Street, E.C., Saturday, June 3rd, 2 to 4.30 p.m.

Readers desiring to join should attend at time and place stated. There is no need to write, providing men conform to the conditions enumerated on this page. Men coming to Coventry should be prepared to proceed to the training centre at once if accepted.

Married men should bring their marriage certificates and birth certificates of children (if any), and all should bring their Reserve cards.

The following men were accepted last week at Coventry and Manchester:

Amery, C. F., Chagford.  
Arden, G. W., Kettering.  
Armstrong, E., Holden Bridge.  
Baggott, S., Hincley.  
Baker, R. W., Bowden.  
Banner, F. H., Warrington.  
Barber, A. G., Downham Market.  
Bartlett, J., Pontypridd.  
Barton, A. E., Tibshelf.  
Beddow, A. E., Willenhall.  
Bell, P., Mansfield.  
Bennett, V. L., Downham Market.  
Bettley, J. A., Willenhall.  
Bond, G. E., East Dereham.  
Brander, F., Evesham.  
Branson, C., Hereford.  
Brierley, S., Chorlton.  
Briggs, J. W., Bradford.  
Bright, E. T., Langworth.  
Brown, P. V., Thetford.  
Callaghan, J. B., Glossop.  
Clarke, H., Evesham.  
Clewley, J., Wolverhampton.  
Cooke, C., Portsmouth.  
Cooper, D. F., Golden Hill.  
Cotter, M., Birmingham.  
Cowap, T. W., Cumberbach.  
Cowan, L. D., Dalston.  
Croad, A. W., Pontypridd.

Currie, G. W. F., Manchester.  
Davies, L., Newton-Willows.  
Diamond, E., Millom.  
Dodd, A. M., Dudley.  
Drewery, J. F., Scotton.  
Dunn, F., Bradford.  
Eastham, W. H., Accrington.  
Eatough, C., Mossley.  
Edmanson, C. S., Sheffield.  
Edmondson, J., Chaburn.  
Ennis, L., Tonyrefail.  
Ewen, E., Boston.  
Fairweather, R. E., Dundee.  
Featherstone, F., Brooklands (Cheshire).  
Fillingham, E., Crowle, Lincs.  
Fitzjohn, C. H., Southampton.  
Gawthrop, W., Colne.  
George, H. G., Swansea.  
Gibson, T. C., Barrhead, Glasgow.  
Gray, C. E., Hammersmith.  
Gray, E., Peckham.  
Griffin, L., Dundee.  
Gunnery, H., Manchester.  
Hacking, H., Accrington.  
Haigh, V. S., Huddersfield.  
Hall, W., Redditch.  
Harkness, W. E., Hexton, near Hitchin.  
Harrison, A. W., Droitwich.  
Harrison, V., Birmingham.  
Hawkins, A., Luton.  
Hill, G. H., Bilston.  
Hill, S., Redditch.  
Hotchiss, G., Connahs Quay.  
Howard, C. E., London.  
Jacobs, W. A., Hampstead.  
Jones, E. G., Bangor.  
Kearns, J., Urnston.  
Keightley, T., Lincoln.  
Kellett, J., Lytham.  
Kim, G. A., Leicester.  
King, J., Daran.  
Large, A., Gorton.  
Laycock, C., Halifax.  
Maddocks, H., Manchester.  
Marr, J., Maryhole.  
Marsden, A., Darwen.  
Miles, W. J., Coventry.  
Moloney, Crickwood.  
Murray, R. J., Kirklington.  
Oliphant, A., Carlisle.  
Parkinson, S., Lincoln.  
Philpot, G. W., Coventry.  
Ray, F., Sleaford.  
Rhodes, F., Liversedge.  
Rowntree, L. E., York.  
Rutherford, W., Kelso, N.B.  
Sanderson, A., Longridge.  
Saunders, H. G., Wolverhampton.  
Shepherd, J. G., Harrogate.  
Simpson, J. E., Caulton.  
Slinn, A., Coventry.  
Smith, W., Halifax.  
Sneath, E., Sheffield.  
Stone, H. O., Taunton.  
Taylor, W., Putney.  
Thomas, J., Coventry.  
Tinline, J. D. M., Teignmouth.  
Treadgold, F. H., Grimsby.  
Tunncliff, C., Blackburn.  
Walker, W. E., St. Anne's-on-Sea.  
Wallace, H., Rugby.  
Watson, G. E., Rotherham.  
Whiteley, A., Whitefield.  
Whitely, W., Kendal.  
Wiles, W., Nottingham.  
Wilkinson, J., Sheffield.  
Williamson, C. H., Ashton-under-Lyne.  
Worthing, F. W., Beverley, Yorks.  
Yates, A., Blackburn.

For the guidance of prospective recruits, the conditions of enlistment are appended:

Applicants must be experienced car drivers or motor cyclists, able to execute ordinary running repairs.

Pay, 1s. 2½d. per day, all found.

Enlistment for duration of war.

Usual separation or dependants' allowance.

Age limit, 19 to 40.

Applicants must be fit for General Service abroad, or for Garrison Duty abroad.

Several recent recruits have seen service in France, either with the Red Cross, the Church Army, or the Quakers.

## SOME FACTS ABOUT THE M.M.G.S. AND H.S.M.G.C.

WHEN the Motor Machine Gun Service was first formed it was known as the Suicide Club. The Armoured Car Section of the M.G.C. is now popularly referred to in the camps as the "Hush, hush," section.

The Heavy Section of the Machine Gun Corps, the recruits for which have passed through the editor's hands for some weeks past, has now been gazetted. Lt.-Col. R. W. Bradley, D.S.O., formerly commanding the Motor Machine Gun Service, has moved over to the new Section, and his successor is Major R. J. Colson. The Heavy Section and the M.M.G.S. are two entirely different sections of the Machine Gun Corps, with separate camps.

Major R. J. Colson, the new commanding officer of the Motor Machine Gun Training Centre, was in command of the original—No. 1—Battery. He was then a captain, and it is a fact worthy of record that this No. 1 Battery of the M.M.G.S. was the first batch of Kitchener's army to go to France on Active Service—a distinction which should alone preserve the fame of the sidecar machine gun batteries. The machines used then were two-stroke Scotts.

It thus appears only fitting that the officer commanding the No. 1 Battery should take his place at the head of affairs when the post became vacant. Major Colson and his battery had a long spell of Active Service in France, and the C.O. returned home wounded last year.

Last week we made a tour of Bisley Camp, the M.M.G.S. training centre, and saw scores of brown faces undergoing the various phases of their training. Motors, it may be mentioned here again, do not appear on the scene until a recruit is regarded as almost a fully trained soldier. Many a man has been disappointed because he was not allotted a motor vehicle from the start, but this is obviously impossible.

By the way, if the new Bisley camp kitchen can be beaten for cleanliness and orderliness we should like to hear of it. No wonder that every man, from the C.O. downwards, is proud of such an acquisition.

The training camps are situated among the most healthy and picturesque surroundings. During the winter the camp boasted a first-rate football team, including several professionals. It reached the final in a military cup contest.

Shortly some sports are to be arranged for the men in training.





## TIME TO LIGHT LAMPS

	"SUMMER" TIME.	
May 25th ...	...	9.26 p.m.
" 27th ...	...	9.29 "
" 29th ...	...	9.31 "
" 31st ...	...	9.33 "

### Police Traps.

One of our readers informs us that he was caught in a police trap recently in Vauxhall Bridge Road at 7 a.m., and on a week-day, too.

### A Home-built Sidecar.

The weight of the boat sidecar body illustrated on page 481 of our last issue is 22 lb. P. Reekie, of Birkenhead, designed and built it himself in his spare time.

### A Comparison.

During last week we drove two sidecar combinations—one British and one American. The Britisher had a semi-automatic lubrication system and a two-lever carburetter which was most difficult to throttle down. The American mount had completely automatic lubrication, to which we did not have to give a thought, and a splendid automatic carburetter capable of an infinite amount of external adjustment when required. Needless to say, we unfortunately preferred to drive the latter. English manufacturers must wake up.

## SPECIAL FEATURES

HEALTHY RECREATION FOR WOUNDED SOLDIERS.  
ON THE ROAD WITH A POWERPLUS INDIAN. THROUGH FEMININE GOGGLES.

### An Important Point.

The great advantage of automatic lubrication is that it takes the responsibility of giving the engine sufficient oil from the driver to the maker. If it is adopted, as it ought to be, the manufacturer will not be able to give the worn out excuse in the event of a breakdown that enough oil had not been given. It will have been the duty of the maker to see that the lubrication was correct before delivery.

### Economy.

Petrol must be saved. Riders should therefore not make unnecessarily long journeys, but make short trips to some attractive spot, camp out for the day, walk through the woods, and return in the evening. Just as much benefit will have been obtained from a health point of view as if a long ride had been undertaken.

### Well-known Rider Married.

Gordon I. Francis was married to Miss Annie E. Barnett on May 9th. In times of peace Francis was associated with the Lea-Francis Co.; now he holds a commission in the A.S.C., M.T.

### Munition Workers go Hill-climbing.

A party of munition workers, mainly from Barrow, had a successful hill-hunting expedition in Lakeland last weekend. The route was planned by Mr. George Abraham, and a description of the proceedings from the pen of this well-known writer will appear in our next issue.

### Pleasure Motoring. The R.A.C. Enquiry.

The R.A.C. has conducted an exhaustive enquiry, which proves conclusively that pleasure motoring has practically ceased to exist. This, for the most part, refers to cars, but the principal motor cycle clubs have also been consulted. The returns from the garages all over the country show that if all private motoring were banned the number of men released for more useful work would be negligible.

### Price of Petrol.

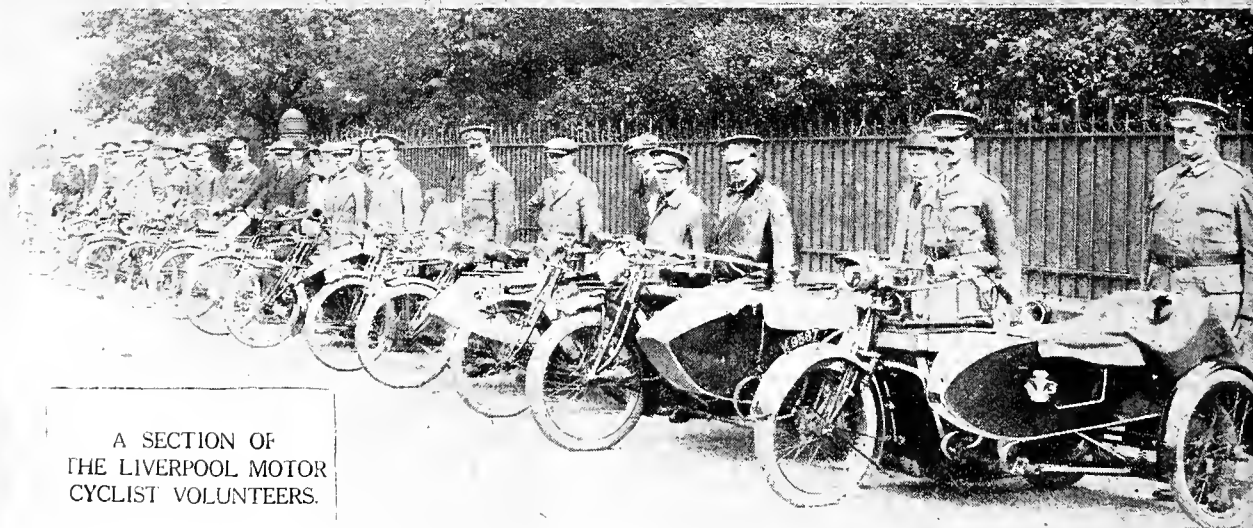
As the majority of our readers know, to their cost, further increases in the price of petrol were made last week. Prices now ruling in England and Wales are as follow:

	Per gal.
Shell ...	2s. 10d.
Shell II. ...	2s. 9d.
Crown ...	2s. 8d.
Pratt's Perfection ...	2s. 10d.
Pratt's II. ...	2s. 9d.
Taxibus ...	2s. 8d.
Mex ...	2s. 9d.
Red Line ...	2s. 10d.
Red Line II. ...	2s. 9d.
Ensign ...	2s. 8d.

The Shell and Crown prices represent an increase of 8d. per gallon.

In Scotland and Ireland the average prices are a penny more per gallon.

The great cost of petrol and the manner in which the chief petrol companies are bleeding all classes of motorists will force many users to curtail considerably, if not give up altogether their motoring.



A SECTION OF  
THE LIVERPOOL MOTOR  
CYCLIST VOLUNTEERS.

Liverpool possesses one of the finest motor volunteer corps in the country. The majority of the men are now in uniform, and a great amount of useful work is being done. The above photograph was taken at last Sunday's parade.

**Imports of Motor Cycle Tyres.**

In a Parliamentary answer, Mr. Pretyman says that the value of motor cycle tyres and tubes imported in 1913, 1914, and 1915 were respectively £101,000, £40,000, and £105,000.

**Healthy Recreation for the Wounded.**

Continuing our policy of dealing with week-end events in the following Thursday's issue, this number of *The Motor Cycle* contains the first illustrated description of last Saturday's sidecar outing for wounded soldiers.

**Future Irish Trials.**

As already suggested, the disturbed state of affairs in Ireland is likely to result in the abandoning of the majority of the motor cycling competitions which were to take place this year. The Cork and District Motor Cycle Club has announced the "indefinite postponement" of its Twenty-four Hours Open Trial, fixed for Whit-Monday, and the Dublin and District Motor Cycle Club is holding a special meeting this week to consider the question of running its open twenty-four hours or abandoning it.

**The Latest Madness.**

Though contradicted in one quarter, the report that Sunday motoring would shortly be prohibited is interesting, as showing that the outcry against "pleasure" motoring is still in existence. If Sunday motoring is prohibited, surely Sunday golf, cinemas, and 10s. 6d. dinners at fashionable London restaurants should be. In fact, motoring, being such a healthful form of recreation, should be the last form of pleasure to be seriously interfered with.

**Substitutes for Petrol.**

Two recently announced substitutes for petrol are Wital and Benzolite. The former is sold at 1s. 5d. per gallon, and the selling firm states that the user starts on a mixture of 50% Wital and 50% petrol, and then, as soon as the engine is warm, it will take pure Wital. Benzolite costs 1s. 10d. per gallon, and, we are told, is giving satisfactory results with motor cycle engines.

Apparently both these fuels cannot be obtained in less quantities than 40 gallon casks. This fact will, we fear, not encourage the use of either fuels by the average motor cyclist who only uses his machine for week-ends.

**A Cloudy Drip Feed Glass.**

Recently while driving a 3½ h.p. single when the weather was rather cold we found that the drip feed glass became half full of oil, and it was impossible to see whether or not the lubricant was flowing through. We first of all made sure that the oil pipe was quite clear, and when we found that this was so we removed the screw valve which controls the number of drops per minute, and then, having replaced the oil pipe in position, placed the nozzle of the tyre pump up against the orifice, gave half a dozen strokes, and the oil was immediately forced to the bottom. The glass barrel kept perfectly clear for some considerable time afterwards. Despite being half full the drip worked perfectly well, but it was certainly comforting actually to see the oil flowing.

JUNE 29th, 1916,

IS THE DATE OF

THE  
MOTOR CYCLEEconomy and Utility  
NUMBER.**Light Car Driver Returns to Motor Cycle.**

Capt. H. Nelson Smith, of the Warwickshire Regt., a former director of the Hillman Motor Car Co., Ltd., Coventry, and a well-known performer on Brooklands, has returned to his old love—the motor cycle. We met him last week on the way to Wolverhampton to get his new mount, a 3½ h.p. chain-driven Sunbeam. Capt. Smith is with his regiment on Salisbury Plain, where life is almost impossible without a motor of some description on which to get about.

**The Taxes.**

Let us hope that the delay on the part of the Treasury in making a further announcement respecting the new taxes on motor vehicles means that the evidence with which they have been provided is being sifted most thoroughly. It is certain that if the whole of the facts as outlined are considered, the Treasury will adopt a much more equitable rate of taxation than that originally proposed.

**The Motorists' Contribution.**

It is pointed out in the leading article this week that if motoring becomes prohibitive owing to high charges the people of this country will have £800,000 more to find in taxes, as this amount was the yield estimated by the Chancellor of the Exchequer as the result of his proposed new taxes on motor vehicles.

**The National War Funds.**

The principal war funds at the week-end stood as follows:

The Prince of Wales's National Relief Fund (£3,258,000 distributed)	£5,874,308	0	0
Fund for the Sick and Wounded	3,743,099	0	0
The Queen's Work for Women Fund	169,446	0	0
Tobacco Fund	106,811	0	0

**Registrations in the Metropolis.**

The London County Council during the quarter ended March 31st last registered 1,405 motor cycles under the Motor Car Acts, thus bringing the total registrations of these machines up to 44,435. There were 788 changes of ownership, making 22,050 changes since registration began.

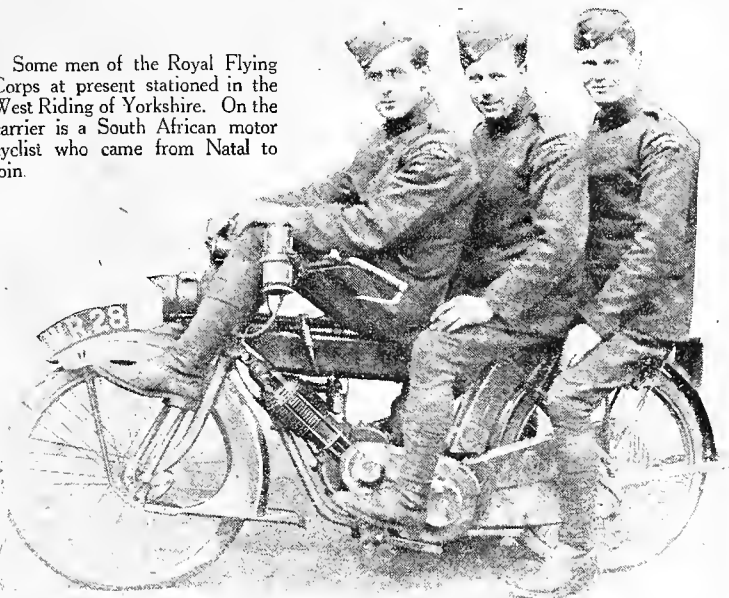
**Keynotes of the Motor Cycle.**

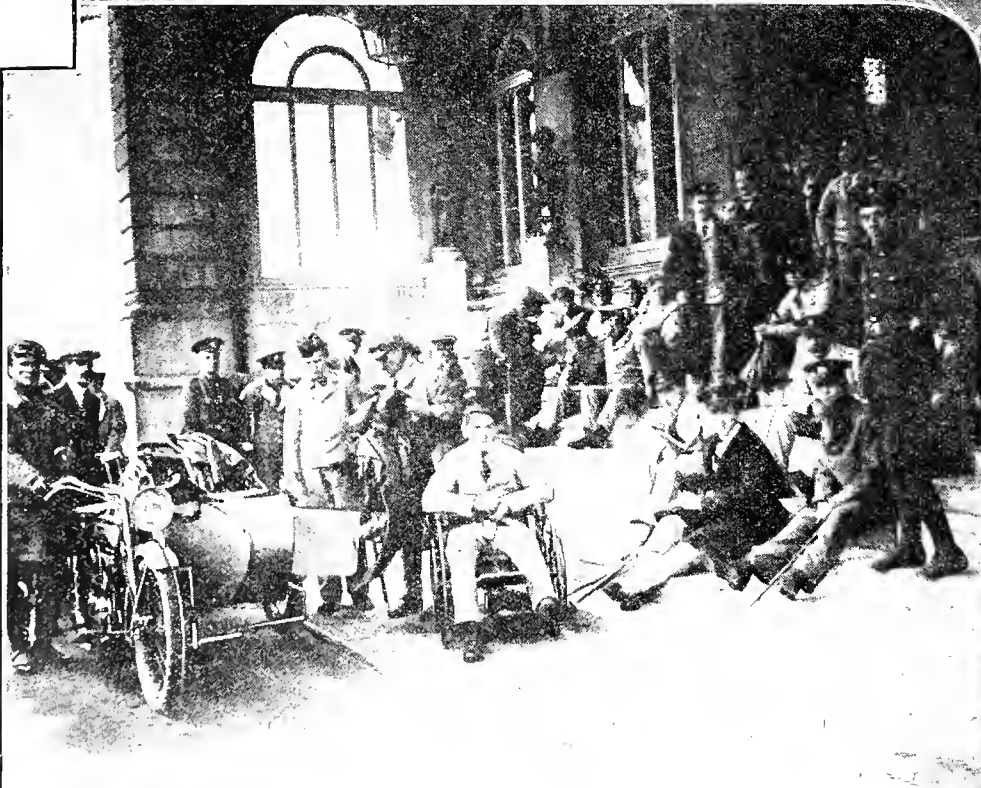
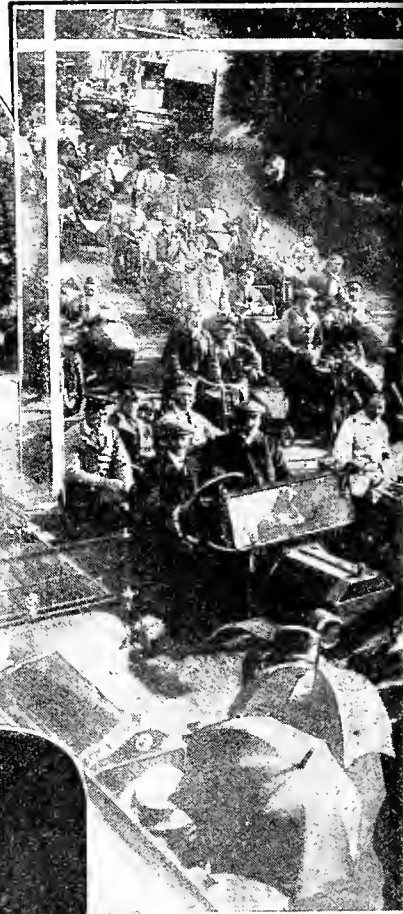
The utility and economy of the motor cycle will receive special attention in *The Motor Cycle* of June 29th. The use of motor bicycles as a cheap means of transport and the growth of the side-carrier will both be dealt with in a thorough manner. The variety of uses to which the modern motor cycle may be put, whether for military or civil purposes, is really surprising.

**Enforcement of Lamp Regulations.**

The recent Lights on Vehicles Order prescribes the use of three lamps on vehicles—two in front (white) and one at the rear (red). The number of accidents that have happened in the past clearly shows the necessity for this Order, but the Commissioner of Police of the Metropolis has hesitated to press it unduly on account of the difficulty that has been experienced in obtaining the necessary number of lamps. He is now satisfied, however, that this difficulty exists no longer, and that suitable lamps can be easily obtained. There is no excuse, therefore, for the use after dark of vehicles unprovided with the necessary lamps, and from the 1st June next the police will be instructed to enforce the law in all cases where a contravention is observed.

Some men of the Royal Flying Corps at present stationed in the West Riding of Yorkshire. On the carrier is a South African motor cyclist who came from Natal to join.





# AIDING TH OF T LAST SATURDAY WOUN

(See pages 493 and 4

Glorious weather favoured the second Harley-Davidson sidecar outing for men from the St. Thomas and City of London Hospitals. Forty-two men were taken a country ride in sidecars and a few cars.





# CONVALESCENCE WOUNDED.

## SIDECAR OUTING FOR SOLDIERS.

(full report of the proceedings.)



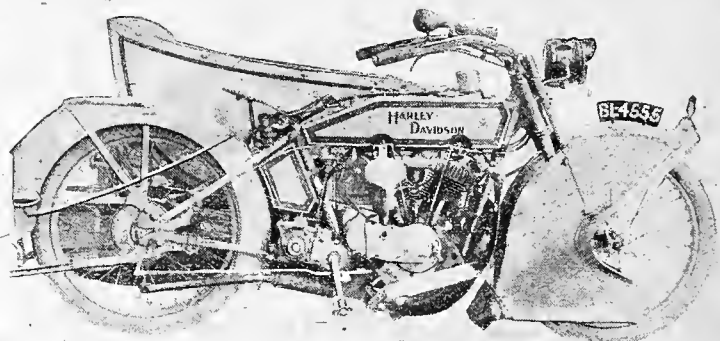
The photographs show various stages of the outing from the start to the Burford Bridge Hotel. At the top right-hand corner the driver of the sidecar is Mr. Duncan Watson, to whose energy and thoughtfulness the great success of the outing was mainly due.



## Average Prices OF Second-hand Machines.

WE give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted, otherwise the last average is given, if within five weeks.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S.	1915	6 3-sp. sidecar	£83	—
"	1914	6 3-sp. sidecar	£63	—
"	1913	6 3-sp. sidecar	£63	—
"	1915	2 3-speed	£44	—
"	1914	2 3-speed	—	£38
Allon	1916	2-stroke	—	£37
"	1915	2 2-stroke	—	£34
Bat	1915	8 3-sp. sidecar	—	£70
Bradbury	1914	6 3-sp. sidecar	£48	—
B.S.A.	1916	4 3-speed	£57	—
"	1915	4 3-sp. sidecar	£56	—
"	1915	4 3-speed	£45	—
"	1914	4 3-sp. sidecar	£50	—
"	1914	4 3-speed	—	£43
Calhorne	1915	2 3-speed	£26	—
"	1914	2 3-speed	£19	—
Campion	1914	6 sidecar	—	£51
"	1915	2 2-stroke	—	£21
Clyno	1914	6 3-sp. sidecar	£48	—
"	1913	6 3-sp. sidecar	—	£53
Douglas	1915	2 3-speed	£45	—
"	1915	2 3-speed	£40	—
"	1915	2 T.T.	£41	—
"	1915	4 3-sp. sidecar	—	£66
"	1914	2 3-speed	£38	—
"	1914	2 2-sp. T.T.	£38	—
"	1913	2 3-speed	£31	—
Enfield	1913	2 2-sp. T.T.	—	£30
"	1916	6 2-sp. sidecar	—	£87
"	1915	8 2-sp. sidecar	—	£74
"	1915	6 2-sp. sidecar	£67	—
"	1914	6 2-sp. sidecar	—	£57
"	1913	6 2-sp. sidecar	£46	—
"	1915	3 2-speed	£42	—
"	1914	3 2-speed	£34	—
Excelsior (A)	1915	7 3-speed	—	£50
H.-Davidson	1915	8 3-sp. sidecar	£72	—
"	1915	4 2-speed	—	£44
Henderson	1913	4-cylinder	—	£29
Hobart	1915	2 2-stroke	—	£30
Humber	1913	3 2-sp. sidecar	—	£26
"	1912	3 2-sp. sidecar	£28	—
"	1912	3 2-speed	—	£21
"	1911	3 3-sp. sidecar	£25	—
Indian	1915	7 3-sp. sidecar	£65	—
"	1915	5 3-speed	£54	—
"	1915	5 3-sp. sidecar	£62	—
"	1915	3 3-speed	£49	—
"	1914	7 2-speed	—	£42
"	1914	7 2-sp. sidecar	£52	—
"	1914	7 T.T.	—	£37
James	1915	4 3-sp. sidecar	£56	—
"	1915	2 2-sp. 2-stroke	—	£25
"	1914	4 3-sp. sidecar	£41	—
Levis	1915	Popular	£23	—
"	1914	2-speed	£22	—
Matchless	1915	8 3-sp. sidecar	£80	—
"	1913	8 3-sp. sidecar	—	£50
"	1913	6 2-sp. sidecar	—	£43
Motosacoche	1913	2 1 multi gear	—	£14
New Hudson	1915	2 2-speed	£28	—
"	1914	6 3-sp. sidecar	£14	—
New Imperial	1915	2 2-speed	—	£27
New Ryder	1915	2 2-speed	£27	—
O.K.	1915	Junior 2-speed	—	£22
P. & M.	1914	3 2-sp. sidecar	£52	—
"	1913	3 2-sp. sidecar	£37	—
Premier	1914	2 2-speed	—	£20
"	1914	3 3-sp. sidecar	£46	—
Rex	1914	6 2-sp. sidecar	£49	—
"	1913	6 2-sp. sidecar	£31	—
"	1912	6 2-sp. sidecar	£26	—
Rover	1915	3 3-sp. sidecar	£50	—
"	1914	3 3-sp. sidecar	£42	—
"	1913	3 2-sp. sidecar	£35	—
"	1912	3 clutch	£23	—
Royal Ruby	1915	2 2-stroke	£27	—
Rudge	1914	3 1 multi sidecar	—	£11
"	1911	3 1 multi	£37	—
"	1911	5-6 multi sidecar	£41	—
"	1913	3 1 multi	£28	—
"	1913	3 1 multi sidecar	£35	—
Scott	1915	3 2-sp. sidecar	£50	—
"	1914	3 2-sp. sidecar	£45	—
"	1913	3 2-sp. sidecar	£35	—



### IMPROVED MUDGUARDING. Harley-Davidson sidecar equipped with Waigh's mudguards.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
Sunbeam	1915	3 1 3-speed	£60	—
"	1914	6 3-sp. sidecar	£79	—
Triumph	1915	2 1 2-sp. 2-stroke	£34	—
"	1914	4 3-speed	£42	—
"	1914	4 3-sp. sidecar	£48	—
"	1913	3 3-speed	£35	—
"	1913	3 3-sp. sidecar	£43	—
Williamson	1914	8 2-sp. sidecar	—	£68
Wolf	1915	4 sidecar	—	£43
Zenith	1914	6 Gradua sidecar	—	£48
"	1913	8 Gradua sidecar	—	£52
"	1913	6 Gradua sidecar	£39	—

### A MOTOR CYCLIST IN RUSSIA.

THE photographs from Russia reproduced herewith, show Sub-Lt. Bedford, R.N.A.S., who in happier times has been a winner of many gold medals on Hazlewood and Rex-Jap motor cycles. Now he is with the British armoured car section in Russia. As is only to be expected, he finds the climate very cold, but particularly healthy and dry. When the thaw comes it will probably be worse than England and very difficult for transport. By wearing suitable clothing one can keep the body adequately protected, and it only leaves the hands and feet, which really do get cold at times. Doubtless Bedford will be able to give some useful hints and advice regarding clothing to competitors in the next Exeter run. The expedition is splendidly equipped with the latest type armoured cars and transports down to Douglas motor cycles.

### EFFICIENT MUD- GUARDING.

IF, for reasons of economy, the motor cycle is to supplant the small car for the use of professional men, some improvement in mudguarding is necessary, and the illustration on this page shows how this may be accomplished. The Harley-Davidson in question is fitted out with Waigh's patent mudguards, as made by



A BRITISH MOTOR CYCLIST IN RUSSIA.  
Sub-Lt. W. H. Bedford, R.N.A.S., who is with the British armoured car squadron in Russia.

## A TEST OF "SPOTS."

AN ATTEMPT TO SOLVE THE PROBLEM OF CHEAPER FUEL.

WE recently made a test of the preparation known as "Spots," sold by the Coal By-Products Co., 40, Holborn House, High Holborn, W.C., which, the makers claim, gives more power to the engine and a 25% better petrol consumption. The machine on which the test was carried out was a new War Office model  $3\frac{1}{2}$  h.p. P. and M. and sidcar, and the test was made in the following manner. A small tank to hold one quart of petrol was purchased from the Service Co. This tank is designed to fit on the front mudguard of the motor bicycle, and on the sides thereof are intended to be painted the registration numbers of the machine. For our purpose, however, it was placed transversely on the centre of the top tube, and was secured by two straps crossing one another, while the tank was saved from damage by placing two pieces of sheet rubber between it and the auxiliary tank. Next the petrol pipe was disconnected from the tank union, and a tap which we had fitted to the auxiliary tank was connected to the end of the petrol pipe by a piece of indiarubber tubing.

The night before the test was carried out, half of one of the "Spots" tabloids was placed in a carefully measured gallon of petrol. Next, 8 oz. of the treated spirit were placed in the tank, and this was done on Brooklands track, and a start was made from the beginning of the mile, the object being to see how far we could run on the treated spirit. The first attempt was a failure, as, owing to the track being under repair, we were forced very high up the bank, with the result that the petrol would not feed. We next sought the assistance of Mr. Rance, the track manager, and he suggested that the best place on which to test the fuel would be on the finishing straight, on which there was a measured half-mile where the races in the last United Services Meeting were run.

The treated spirit was again carefully measured out, and we proceeded, with Mr. C. P. Preston, who is responsible for the sale of "Spots," in the side-

car, to cover this distance as long as the fuel would last. The tank ran absolutely dry just short of  $4\frac{1}{2}$  miles. No appreciable difference in power was noticeable, and we were also careful to note that very little, if any, extra air was required by "Spots." Previous to filling the tank with treated spirit the float chamber was emptied. Next, the same test was carried out under precisely similar conditions with the same quantity of petrol, and the tank ran dry after covering  $3\frac{1}{2}$  miles.

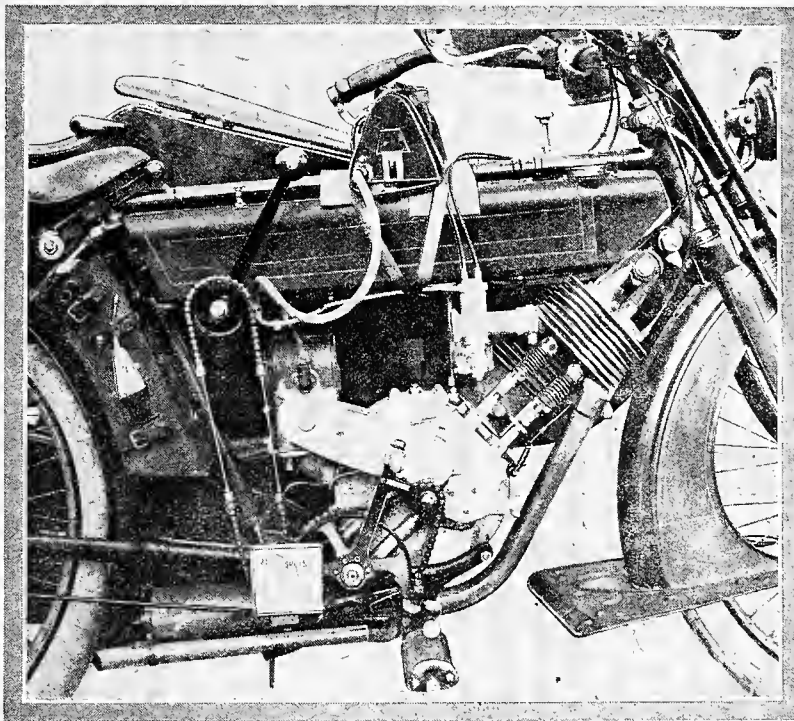
This means that on the occasion of this particular test "Spots" gave an increase in consumption of about 28%. These results worked out to ninety miles and seventy miles to the gallon respectively, which is interesting, as on a long run over give-and-take roads the consumption of the machine on pure petrol during the Easter week-end worked out to sixty miles per gallon. It is claimed that "Spots" increases the carbon contents of the fuel, and in this way improves the mileage per gallon.

The run home from Brooklands was made on the treated spirit, and we noticed on the way back no apparent increase in power. Although

the machine was fully loaded, it took the hill out of Brooklands on top speed, but we imagine that it would have done equally well on petrol. The accompanying photograph shows the manner in which the tank was attached to the machine, and the way in which it was connected up to the carburetter.

It will be agreed that the result of the foregoing test is quite extraordinary, and consequently we have arranged a further test of "Spots," which we shall carry out on a different make of machine fitted with a different carburetter from the one already used. The result of this second test will appear in an early issue.

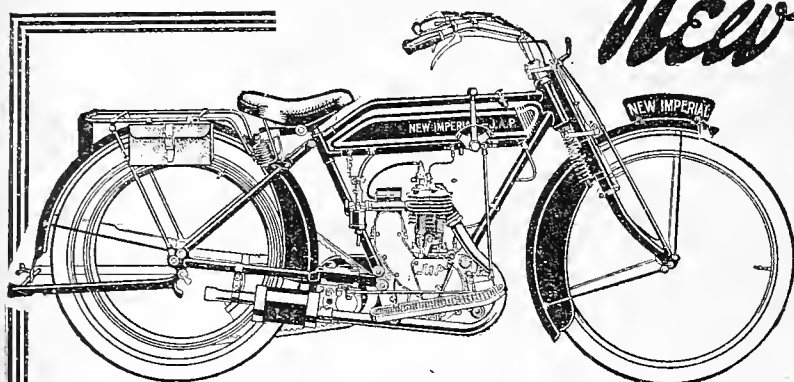
It would be interesting to see how the treated petrol would behave when given a series of tests by such official bodies as the Auto Cycle Union and the Royal Automobile Club.



Sidcar on which the "Spots" test was carried out. The temporary tank is shown strapped to the top tube. The size of a "spot" may be judged by the specimen lying on the footrest.

# Economy

is due from all. You cannot have a better means of effecting extreme economy, than by the use of the "New Imperial Light Tourist," as its low cost of running is so marked—averaging almost twice the mileage of other types of the same power. In addition, you have the "Perfect Dependability" and "Ease of Control" so markedly present in the "Light Tourist." The price of the



## New Imperial

stamps it the Best Value for Money in motor cycles to-day.

Two-speed .. .. . £38 0

.. with clutch & kick starter £44 8

Lady's, clutch and kick starter. £46 8

NEW IMPERIAL CYCLES, LIMITED,  
BIRMINGHAM.

(Est. 1887.)

Booklet "Don't Take Risks and Why," sent free on receipt of request.

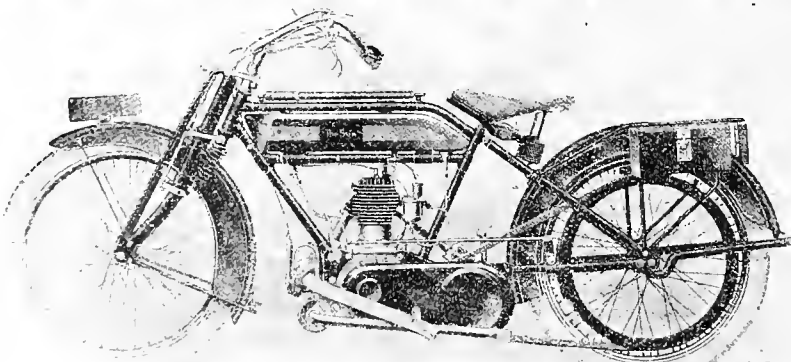
# 4 H.P. "SUN"-J.A.P.

COUNTERSHAFT  
3-SPEED CEAP  
(STURMEY-ARCHER.)

## 59 GUINEAS.

### "ALL" THE BARGAINS

are not to be found amongst the second-hand announcements. This model at the price is the biggest bargain in the motorcycle world to-day. Investigate this statement.



### ALL "SUN" MODELS

are bargains, i.e. by bargain is meant the fullest possible value for money. This particular model, however, stands out as of exceptional value and merit.

THE SUN CYCLE & FITTINGS Co., Ltd., Aston Brook St., BIRMINGHAM.



# Letters To the Editor

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

## Top Feed Carburettors.

Sir,—May I through the medium of your journal venture a reply to Capt. Lindsay's criticism of my previous letter regarding top feed carburettors.

I own to confessing "that I had met with trouble from choked filters," but not in connection with the carburettors on our machines, which are fitted with a well-designed and efficient filter and sediment cap.

I must admit that when it comes to a question of time his method of float chamber inspection beats mine; but on the very rare occasions when it is necessary to inspect the interior of a float chamber we, as a matter of precaution, inspect the jet also, and, for this reason, find this method is better than the simpler expedient of disconnecting petrol union and unscrewing the float chamber lid.

I am afraid the mention of a bayonet joint brings unpleasant memories to my mind. I was once the possessor of a carburettor fitted with a float chamber lid of this description. Alas! its ease of removal was sadly counter-balanced by the equal ease with which it allowed the petrol and oil to escape in company *via* this self-same joint to proclaim loudly my petrol lubrication.

I am, of course, aware that a combined tap and filter does not improve the design of any carburettor; but I feel I must draw Capt. Lindsay's attention to the enormous number of W.D. Douglas machines running at the present moment which carry this fitting, "although they are fitted with a celebrated make of bottom feed carburettor which owns its own filter."

I also have charge of several 1915 machines fitted with bottom feed carburettors, and, in justice, must admit that they perform satisfactorily, but alas! this is in a great measure due to the fact that the petrol is strained by a combined tap and filter before it reaches them.

I hope my letter will not convey the impression that I am in civil life a petrol tap and filter manufacturer, but at the risk of this impression I must say that I would like to see every make of machine fitted with this inexpensive and invaluable little fitting. It appears to me infinitely better to collect the foreign matter as it leaves the tank in preference to collecting it when it reaches the carburettor.

MOTOR CYCLIST SERGEANT.

## The Taxation of Motor Cycles.

Sir,—In February I took out a licence for a motor cycle. On the licence it distinctly states, without any qualification whatever, that I am "authorised to keep one motor bicycle or tricycle from the date hereof until the 31st day of December next following." In the face of that how can the authorities come on me for any extra tax till next January? However, I suppose the Government is going to follow the German example, and simply treat it as "a scrap of paper."

If I were a wealthy motorist I should flatly refuse to pay any extra taxation till next year. Not being in that position I shall either have to sell my machine, if possible, or take it to "uncle's" till we get a more reasonable scale of taxation. In my opinion, if the Government persists in the proposed new motor taxation it will find it to be a case of "killing the goose that lays the golden eggs" in more senses than one.

6 H.P.

Sir,—With regard to the motor taxes, I will say nothing as to the increased amounts, but what seems to concern me most, and seems very wrong, is to bring them into force before the existing licences have expired. All of us hold

a licence in which the State has authorised us to keep a motor for the year ending December 31st, 1916. This is surely a contract between the State and the subject, and it is far from just for the State to depart from their own terms.

The Chancellor has knowledge of the existing licences, and therefore, by causing them to end in June and August next, he is causing the State to retract from an undertaking entered into with many thousands of citizens.

I feel strongly that all taxes must be constituted honourably and weigh justly with one and another—that is, if good is expected to come from the use of the money. W.P.

Sir,—Could you possibly find a little room in your splendid paper, *The Motor Cycle*, re the new taxation for motor cycles?

I notice in the "Question and Replies" columns a query with regard to the tax on a  $3\frac{1}{2}$  h.p. machine. It is replied to as being £3 3s., the same as that of a 10 h.p. light car of last year.

I am temporarily employed by the Admiralty, and have Sunday duty to perform, and, living in the country (with a decidedly awkward train service), considered the purchase of a  $3\frac{1}{2}$  h.p. Norton for the purpose of fulfilling the aforementioned "Sunday duty," but on second consideration deem the new tax fabulous, and have abandoned the idea.

I imagine myself to be one in a million who will suffer thusly, and it goes a long way to prove that a motor cycle is anything but a luxury; it is, in fact, in hundreds of cases a necessity. J.F.D.

[The proposed tax on the  $3\frac{1}{2}$  h.p. Norton is £2 2s., as this machine has a small bore and a long stroke.—Ed.]

Sir,—As a regular reader of *The Motor Cycle* I should like to express my opinion of the recent increase in taxation. The modifications have been carried out in a most unfair and unbusinesslike manner, and there seems little hope of there being any redress. Surely the fairest way is to increase the tax on petrol, then the people who use the most pay the most; it would stop joy-riding (if it exists), and would tend to improve consumption. Failing this, I certainly think *The Motor Cycle* scheme is best. Could not a form be printed in *The Motor Cycle*, which every reader would be glad to sign and forward to the Editor? I own a 5 h.p. four-cylinder F.N. second-hand price £17 10s., and it is annoying, to say the least of it, to see a car of double the power, and costing, say, £200, getting off with a £4 4s. tax, while I have to pay £4 14s. 6d.

FOUR-CYLINDER.

Sir,—In the various objections to the heavy additional tax on motor cycles stated in recent correspondence I have not seen my particular case dealt with.

I have a 6 h.p. cycle and sidecar which, I suppose, comes under the £4 14s. 6d. tax. It was bought second-hand three years ago, and I only average about 1,500 miles a year, having only the opportunity during Saturday and Sunday afternoons for riding, except for the week's holiday once a year. The tax therefore represents nearly  $\frac{1}{2}$ d. per mile in itself, and I should think there are hundreds of other riders in a similar position, and upon whom it will fall very heavily. A rider covering 10,000 miles per year is therefore taxed only  $\frac{1}{2}$ d. per mile, and, therefore, it seems to me that a tax on petrol would have been far preferable, as it would have



be more uniform on the user, whether he owned an Auto-wheel or a Rolls-Royce £1,000 car, the tax depending on the distance travelled.

Why not a tax of, say, ½d. per cubic centimetre, or even 1d., in war time, and insist upon makers in future having the capacity cast on the cylinders or stamped thereon? Thus makers would not be sacrificing their engines by trying to keep them, say, under the 200, 300, or 400 size, but if they found a capacity of 208 suitable for them, they would know their customers would not object to eight additional halfpennies or pennies as the case may be.

However, when all is said and done, the very best way is to tax petrol, if it must be done, and so equalise taxation on all users, big or small.

#### EQUALISATION.

Sir,—I think it is shameful to put such a heavy tax on a growing industry, and a very great hardship, because everybody that owns a motor cycle is not a millionaire. In fact, here, in Cornwall, you can see miners riding motor cycles to their work. When men work half a mile down a tin mine, and do not spend their money in beer, but on a motor cycle, so that they can get about and have a little more fresh air, to enable them to go down the mine and help to raise the tin and wolfram for the Government, it is very hard that they should be so highly taxed. At the commencement of the war the Government taxed petrol, with other things. There was no grumbling then, but now that they suggest an extortionate tax on the motor cycle I say it is time that someone agitates before it is too late.

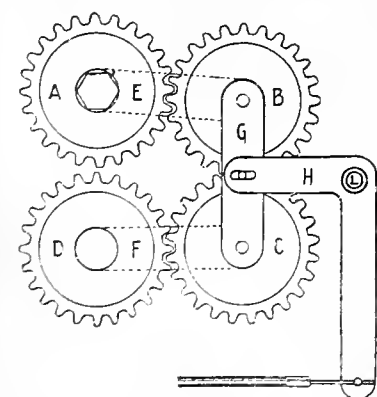
CORNISHMAN.

Sir,—I have read Mrs. Willoughby's letter to *The Motor Cycle*, and deeply sympathise with her. My case is much similar. My wife is a helpless invalid since last May; my son, our only child about eighteen years, is almost blind; both are entirely helpless. I was advised by the doctor to give them both plenty of fresh air. Last November I bought a new Royal Enfield combination, and since then we have had some splendid runs. I am only a working tradesman, who could just manage to keep things going, but now, with this excessive tax, I shall have no option but to lay my machine aside or sell out. I think owners of push cycles should be asked to pay a little instead of always increasing the tax of the motor owner.

ROYAL ENFIELD.

#### Magneto Advance.

Sir,—Your enquiry for an advance or retard device to be used on Dixie magneto or other makes was first unnoticed by me. Before the war broke out I made a device enabling one to advance or retard the magneto spark, and still keeping the magneto on its maximum firing point. My device was offered to a British maker a short time before the war, who answered me that it was not very useful, and not much used, so that the usual one could remain unaltered, so I decided to keep it till after the war. I now send you a rough sketch of the device, which has been delivered for protection. Description:



A is the magneto sprocket.

D the last gear wheel from the engine. The magneto wheel is disconnected from D wheel by slightly raising the magneto.

D C B Toothed wheels are geared together so that the gearing goes from D to G, B, and A fitted to the magneto.

B and G wheels are fitted on the articulation point of a sort of

parallelogram. The bars E and F pivot on the centre of wheels A and D, and pass under them, as shown by dotted lines.

The bar G connects the wheels B and C, and passes over them.

The wheels B and C are fitted only to the parallelogram, and move with it in a down and up motion to a certain extent round A and D wheels. The up and down motion is given by the bell crank lever pivoted at the point L and set in motion by a Bowden wire and cable carried to a lever fitted in the usual manner on the handle-bar.

A spring not shown on the sketch is necessary for the reverse motion, as will be understood.

You will easily comprehend that if you move the wheels B and C up or down by means of the handle-bar lever connected to the bell crank lever H the magneto spark will be advanced or retarded, and whatever be the position of the lever the firing point will remain "unaltered," and that could not be attained in the usual device.

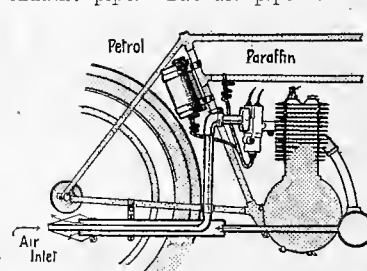
In case of magneto chain drive, the magneto chain sprocket A should be removed to D.

GEORGE-BALLNOT.

Tours, France.

#### Paraffin as a Fuel.

Sir,—I enclose a rough sketch, also a photograph, of an appliance which I have devised and fitted to my 3½ h.p. single-gear Triumph motor cycle to enable paraffin to be used instead of petrol. The air is drawn into the carburetter through a pipe which is contained within the enlarged exhaust pipe. The air pipe is covered with asbestos cord



from the exhaust pipe to the carburetter in order to prevent dissipation of heat. The engine is started on petrol from an auxiliary tank, and then the paraffin is turned on. As a matter of fact, I find it possible to start by injecting a teaspoonful of petrol through the compression tap. I have

driven the machine on household paraffin for 400 miles by means of this attachment with the following results: No undue overheating, no loss of power on the level or hills, no more carbonisation than with petrol, and no objectionable fumes.

As an instance of what the machine will do on paraffin, I drove it from Manchester to Blackpool and back, pulling a heavy coach-built sidecar, driver 12 st., passenger 10 st., and a two-gallon can of paraffin on carrier. The machine climbed all hills excepting one where I was baulked by a cart. The appliance (which I have protected provisionally) has the advantage of simplicity, cannot get out of order, could be fitted to most machines, and would be cheap to manufacture. Paraffin consumption averages 65-70 m.p.g. over give and take roads with no alteration made in the original Triumph carburetter.

WM. BARNETT.

#### Motor Cycles in Malta.

Sir,—We notice in your issue of April 27th, which has just reached us, that Mr. Rossiter, writing under "Naval and Military Notes," states "there are disgracefully few motor cycles in Malta."

As we think that this is calculated to give quite a wrong impression, we may mention that we have between fifty and sixty customers who own motor cycles on our books. We really cannot agree that this is disgracefully few for an island approximately eighteen miles long and nine broad. You illustrated a beautifully equipped F.N. combination a few weeks back, and we may say that nearly all the well-known makes are represented here, including Triumph, New Hudson, Douglas, Scott, Enfield, Bat, etc.

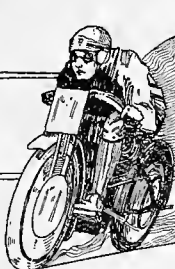
We can only wonder where Mr. Rossiter spent his weeks of waiting without seeing many of these machines.

The main roads here have a very fair surface, but they abound in the most wonderful bends and corners, and on a wet day are a searching test for the skidding propensities of a machine. The local drivers have the very vaguest ideas about the rule of the road, and frequently draw right across your path when you sound your horn. Lightweights, with two-speed gear are most suitable for solo work, and a powerful machine is desirable for sidecar work, as some of the hills are very severe.

DOWNS AND JOHNSON.

Malta.

## QUESTIONS



## REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy, for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Four-stroking.

**Q.** Can you explain the cause of a 2½ h.p. two-stroke "four-stroking"? I have examined the carburetter, but have not discovered any signs of flooding; also the oiling seems to be about correct.—N.G.B.

The trouble is usually due to the use of a carburetter to which the incorrect size jet is fitted. This is likely to be either too large or too small—more probably the former. Too small a jet usually causes popping back into the carburetter.

## Driving without a Licence.

**Q.** I was on a journey the other day, and was pulled up for driving my motor cycle without a driving licence and a registered number. Can I be summoned for not having a registered number, and for using a false one? The number I used was registered in my name, but on a 1915 model, and not on the motor cycle I was using at the time.—J.T.H.

Certainly you may be summoned for not having a registration number and a driving licence, and your licence would be endorsed. You have been obviously guilty of driving without a licence, and also of driving an unregistered machine.

## Overheating.

**Q.** I have a 4½ h.p. single-cylinder motor cycle. The engine gets very hot, even when riding solo. I have tried using smaller jets, but this does not make any difference. I use Coolie oil, and lots of it. The engine pulls well, and the compression is good, but after travelling about five miles the cylinder will blister my hands if I touch it. I have just had the engine down, and scraped all deposit from the cylinder and piston, but it is still the same. I have tried everything I can think of, and I should be grateful if you would help me out of the difficulty.—H.J.

You can seldom bear your hand on the coolest running motor cycle cylinder after it has run four or five miles. If the machine pulls well and does not lose power through overheating, we do not think you need worry about not being able to bear your hand on the cylinder.

## How to Fit a Magneto Switch.

**Q.** I have a twin-cylinder Douglas, and wish to fit a magneto cut-out. I have already bought one, and by connecting to front plug I have successfully cut out the front cylinder. Is it necessary to buy another cut-out in order to stop back cylinder firing? If not, would you please tell me how to connect up?—R.C.D.

What you will have to do is to apply to the makers of your magneto, and ask them to supply you with a contact breaker cover to which a switch terminal is attached. Then connect this terminal with a piece of low-tension wire to the cut-out switch on the handle-bar. What you have done at the present time is to fit a high-tension cut-out, which is quite wrong, firstly because it cuts out only one cylinder instead of both, and secondly because in wet or damp weather in the act of operating it you will get a very severe shock, which will probably throw you off the machine.

## Difficult Starting.

**Q.** I have a new 4½ h.p. which will not start with the kick starter. I have sometimes to run it for about fifty yards before it starts; after that it goes very well. As it has not done 200 miles, I would be pleased if you could let me know a remedy, as I have a bad foot and cannot run very well with it.—L.E.

Starting difficulty is nearly always due to the carburetter receiving too weak a mixture at slow speeds. This is usually caused by the use of too small a jet, an insecure joint between the carburetter and the engine, which allows air to get in, or to not having the air properly closed. Engines are less prone to start in cold weather than when the weather gets warm. See that all doubtful joints are bound with adhesive tape. You might also look to the following adjustments: See that the contact points are clean, that the rocker arm is quite free, and the points separating the correct distance, viz., .4 mm. Make sure the plug is in good condition, quite clean, and adjust points to give a gap of about ⅜ in. See that the valve springs are strong enough, and tappets adjusted with a clearance of not more than .4 mm.

## Handle Starting.

**Q.** I have a 3½ h.p. motor cycle and sidecar, with Precision engine, handle-starting Roc two-speed gear. I find difficulty in starting—being rather short armed and not very strong in the arms. I find it rather a job to get a start when the engine is cold. Would fitting a decompressor assist matters? I presume I should not have to raise exhaust valve lifter, which would give me my left hand free and would make it easier work turning the handle.—J.F.

A decompressor would probably help you to start to some extent, although we think that if you get your engine and carburetter correctly adjusted you should have no trouble. Starting with the handle is largely a matter of "knack." If a decompressor were fitted, you would not have to lift the exhaust valve.

## Knocking.

**Q.** I have a 1916 4 h.p. counter-shaft Triumph motor cycle, and have done about 600 miles, and it has started knocking—on hills, against the wind, and when changing from second to top gear. I have done everything I can think of—cleaned cylinder and piston, adjusted tappets, ground valves in, changed plug, and the spark takes place on dead centre of firing stroke with the lever fully retarded. I cannot find any play in the bearings. I may say when the machine is running on the level and not against a bad wind it runs beautifully. The knock sounds as if there were a lot of play between the valves and tappets on the start of a hill, and then this grows into a knock as the gradient increases.—C.F.D.

We should say that the trouble is probably due to the machine being geared too highly. If there is too much clearance between the valves and tappets it is easy to reduce this. It is better not to allow the engine to knock more than you can help, as usually this means a big strain upon the bearings. The following are the most usual causes of knocking: Dirty engine, loose bearings, worn piston rings, too high a gear, ignition too far advanced, weak mixture, too rich a mixture causing overheating.

## PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

**Valve Overlap.**

**Q** I have recently received back my 4 h.p. single after a makers' overhaul. The valve timing is now as follows: The exhaust closes dead on top of the stroke and the inlet begins to open just the smallest fraction before the exhaust has found its seat. Is this right, or would it improve matters to time the inlet to open a tooth later? At present there are no noises in the carburetter, and the engine will run more slowly than of old. I have always understood, however, that the exhaust valve should have shut before the inlet starts to open.—J.T.

We should recommend you to retain the makers' setting of the valves if the machine is giving satisfaction. Altering the timing of the inlet a tooth would probably be much too much. Quite a number of machines are timed with a slight overlap in the valve settings, especially for speed work, and, provided no difficulty is experienced in running slowly or starting, the overlap is likely to be of benefit.

**Misfiring.**

**Q** I should be much obliged if you would help me out of a difficulty I am experiencing with my 6 h.p. twin-cylinder. I recently overhauled the engine, fitting new valve springs, etc., but when on the road the engine seems to misfire in one or both cylinders. The rocker arm is free, there is a good spark at the plugs, and the valves are free. The engine starts without an injection. The machine is fitted with a Binks three-jet carburetter. I should also like to know how to get airtight joints at the carburetter or induction pipe unions.—W.C.

You do not give us many clues as to the cause of your trouble. Of course, air leaks at the induction pipe unions

might be the cause, or it may be a partially choked jet. To make the unions airtight it should be noted that the joints fit accurately and are joined up tightly. To test for air leaks run the engine slowly in the garage, apply a little oil to the suspected joint, and if this is drawn in it will indicate the joint is not tight. To make it airtight you may wrap string soaked in oil at the back of the flange on the induction pipe or the whole union with insulating tape. To overhaul adjustment such as the magneto contact breaker, make sure the points are clean and separating .4 mm., see plugs are clean, and have a gap of about  $\frac{3}{32}$  in., and fit new valve springs.

**Magneto Lubrication.**

**Q** I should feel very much obliged if you would kindly inform me how and at what part I should oil my magneto. It is a Bosch, fitted to a 2½ h.p. New Imperial.

I have ridden the motor bicycle about 2,000 miles now, and it seems to me that it would be advisable to oil the magneto. I can, however, discover no oil hole. Does the armature-shaft, at the point where it gets its drive, receive any oil from the engine? But what of the other side of the shaft? Should any oil be applied to the contact breaker part of the magneto? I shall greatly appreciate your advice on my difficulty.—W.J.M.

If there are two lubricators—one for the contact breaker and one for the spindle—marked oil, you should put just a drop of engine oil in each about every 500 miles. If, as you state, there are no oil holes, you will know that the ball bearings are packed with grease, and are guaranteed to last for a considerable time. No oil is received from the engine. On no account put any oil on or near the contact breaker, otherwise it will affect the firing. Having ball bearings the magneto will run almost indefinitely without lubricating.

**READERS' REPLIES.****Flooding Carburetter.**

Having noticed a query regarding carburetter flooding by "F.R.H." in your issue of April 27th, I am writing to say I have had the same trouble, i.e., a leak under the jet, which I have cured by screwing up a nut under the jet. To avoid stripping the thread I should advise your correspondent to screw up until the dropping ceases, and no further.—E.S.

**Mysterious Pulling Up.**

In your issue of May 4th I note there is one of your correspondents somewhat puzzled as to what he terms a mysterious pulling up of his 3½ h.p. three-speed motor cycle in Ceylon. I am of opinion that the pulling up of the cycle is due to the high altitude (6,000 feet), and the only way to overcome the difficulty will be to have an engine with larger valves.—W. J. DUNN.

**RECOMMENDED ROUTES.****LEEDS TO STOKE-ON-TRENT.—C.P.H.**

Leeds, Huddersfield, Slaithwaite, Delph, Oldham, Ashton, Hyde, Adlington, Macclesfield, Congleton, Tunstall, Burslem, Hanley, Stoke.

**LLANGOLLEN TO SLEDMERE.—T.W.C.**

Llangollen, Whitchurch, Nantwich, Crewe, Sandbach, Congleton, Bakewell, Buxton, Chesterfield, Worksop, Doncaster, Selby, York, Stamford Bridge, Fridaythorpe, Sledmere.

**DUNSTABLE TO BOURNEMOUTH.—J.S.**

Dunstable, Tring, Chesham, Amersham, Beaconsfield, Slough, Windsor, Egham, Bagshot, Basingstoke, Winchester, Romsey, Cadnam, Lyndhurst, Christchurch, Bournemouth. Distance, 120 miles approximately.

**BOURNEMOUTH TO REDDITCH.—A.K.S.**

Bournemouth, Baileygate, Blandford, Warminster, Westbury, Melksham, Chippenham, Malmesbury, Cirencester, Northleach, Stow-on-the-Wold, Evesham, Alcester, Crabb's Cross, Redditch. Approximately 139 miles.

**MALVERN TO EDINBURGH.—R.C.F.**

Malvern, Worcester, Kidderminster, Wellington, Whitchurch, Tarporley, Warrington, Wigan, Preston, Lancaster, Kendal, Penrith, Carlisle, Longtown, Langholm, Hawick, Galashiels, Stow, Edinburgh. Approximately 305 miles.

**GOLDER'S GREEN (LONDON) TO BRIGHTON.—S.M.S.**

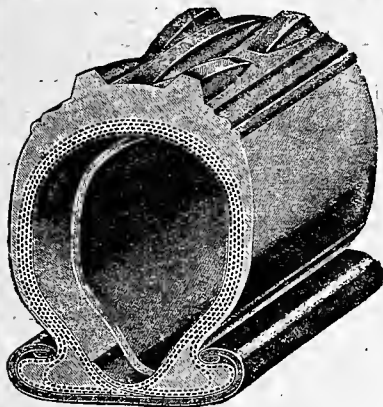
Golder's Green, West End Lane, past West Hampstead Station into Cavendish Road, Wrentham Avenue, Bathurst Gardens, here turn left and go across Harrow Road, down Wood Lane to Shepherd's Bush, Hammersmith Broadway, over Hammersmith Bridge, down Castelnau Road to Barnes, over Barnes Common into Roehampton Lane, leading on to Putney Heath, where turn left and go through Kingston Vale to Kingston, then along Surbiton Parade until you meet a point where you strike the tramlines; here turn left and follow these, going straight on up the Brighton Road, and so via Leatherhead, Dorking, and Horsham.



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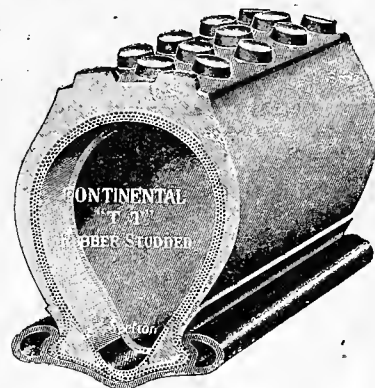
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Suitable for 3½ h.p. machines.

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26 x 2½ Model de Course .....	18/6	33/3
28 x 2½ " .....	18/-	34/-
26 x 2½ Lightweight T.T., basket pat. .....	12/6	21/-
26 x 2½ T.T., basket pattern .....	17/6	28/-
26 x 2½ x 2½ " " .....	21/6	28/9
26 x 2½ for 2½ " " .....	22/6	37/9
26 x 2½ " " heavy .....	21/6	34/-
26 x 2½ " " " .....	27/6	37/6
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650 x 65 Fluted pattern .....	18/-	28/-
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26 x 2½ A Won, rubber-studded .....	19/6	32/-
26 x 2½ " " .....	22/6	32/-
26 x 2½ " ribbed .....	14/6	27/6
26 x 2½ B quality, rubber-studded .....	13/6	26/6
650 x 65 Fluted .....	21/-	30/6

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26 x 2 Combination, heavy .....	21/-	39/-
26 x 2 " extra heavy .....	24/6	45/-
26 x 2½ Grip-ribbed, heavy .....	17/6	29/-
26 x 2½ " extra heavy .....	22/6	36/-
26 x 2½ Combination, heavy .....	25/-	42/-
26 x 2½ " extra heavy .....	29/6	48/6
26 x 2½ Grip-ribbed, heavy .....	17/3	30/6
26 x 2½ " extra heavy .....	25/-	37/6
26 x 2½ Combination, heavy .....	27/6	45/-
26 x 2½ " extra heavy .....	32/-	52/6
26 x 2½ Grip-ribbed, heavy .....	22/3	32/9
(for 2½ rims) " extra heavy .....	27/6	40/-
" Combination, heavy .....	30/-	48/-
" extra heavy .....	35/-	56/6
26 x 2½ Grip-ribbed, heavy .....	20/-	31/6
(for 2½ rims) " extra heavy .....	25/-	39/-
" Combination, heavy .....	28/6	46/6
" extra heavy .....	32/6	55/-
26 x 3 Grip-ribbed, heavy .....	21/-	36/6
(for 2½ rims) " extra heavy .....	26/-	44/-
28 x 2 " heavy .....	14/6	30/6
28 x 2 " extra heavy .....	17/6	37/-
28 x 2½ " heavy .....	16/5	31/9
28 x 2½ " extra heavy .....	21/-	39/-
HUTCHINSON.		
28 x 2½ Passenger .....	29/6	45/-
AVON.		
26 x 2½ Tricar .....	27/6	38/6

### COVERS.

Dominion.	Our Price.	List Price.
28 x 3 .....	50/-	—

(Manufactured by the Dominion Rubber Company, Canada. Specially made for rear wheel of Indians and Harley-Davidsons. The heaviest cover manufactured for this type of machine.)

### TUBES.

CONTINENTAL.	Our Price.	List Price.
26 x 2 .....	4/3	7/3
26 x 2½ (endless only) .....	5/3	8/6
26 x 2½ x 2½ .....	5/3	8/9
26 x 2½ x 2½ .....	5/9	8/9
650 x 65 .....	5/6	11/6
650 x 75 or 700 x 80 .....	6/-	14/-
28 x 2½ .....	7/-	10/6

Batted, 1/- extra.

ELITE (fully guaranteed).

26 x 2½ .....	5/9	7/9
28 x 3 .....	9/6	13/-

### CLINCHER.

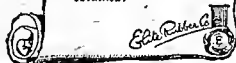
24 x 2 .....	3/9	6/6
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### BELTS.

CONTINENTAL.	Our Price.	List Price.
1 in. section .....	1/3	2/2
1½ in. " .....	1/-	1/11
CLINCHER FLEXIS.		
1½ in. section (8ft. 6in. lengths only) .....	1/6	2/6
1 in. " (7ft. 4in. and 7ft. lengths) .....	1/3	2/1

**McGuarantee**

all these goods to be quite new, and are prepared to replace any tyre that proves faulty at a price proportionate to the mileage obtained.



These treads when fitted make the cover equal to the heaviest cover manufactured.



These treads when fitted make the cover equal to the heaviest cover manufactured.

**ELITE RUBBER Co., Ltd.,** 266, Vauxhall Bridge Rd., Victoria, S.W.  
Phone: Victoria 6553. One Minute Victoria Station.

In answering this advertisement it is desirable to mention "The Motor Cycle."



# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

ADVERTISEMENTS in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pay carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### Abingdon.

**ABINGDON** King Dick, 3 1/2 h.p., 2-speed, clutch, handle starter, with sidecar; trial; £21.—Hill, 183, Crystal Palace Rd., E. Dulwich. [5899]

**1915** 4 h.p. Abingdon King Dick, Philipsen pulley, excellent condition; £42, or near offer.—Scott, Beaulieu, St. Faith's Rd., Winchester. (D) [5597]

### Advance

**ADVANCE** Combination, 5-h.p. twin, mag., 2 speeds, countershaft; £19 19.—Wandsworth Motor Exchange, Ebner St., Wandsworth Town Station. [X0341]

### A.J.S.

**A.J.S.** new 1916 models, in stock, or for early delivery.—Moss, Wey. [X0386]

**A.J.S.** 1916, 6 h.p., actually in stock.—Crow Bros., 190, High St., Guildford. [5089]

**A.J.S.** Models in stock, with sidecars.—Turpins, 22 and 29, Preston Rd., Brighton. [0716]

**1916** A.J.S., 6 h.p., brand new; £84.—Hickling, Small-dale Bottom, Bradwell, near Sheffield. [5690]

**1916** A.J.S. 4 h.p. Combination in stock.—Williamson, A.J.S. Expert, Chapel Ash Depot, Wolverhampton. [X0484]

**A.J.S.** 6 h.p. Combination, with spare wheel, etc., turned almost new; £90.—Marston, 26 and 31, Bridge St., Chester. [X0307]

## THE BEST WAY

For Buyers who seek the Best Bargains is to choose from the Best selection of Best makes offered at the Best possible price for the Buyer, Cash or Easy Terms, from the firm who give the Best and most generous exchange allowance for present mounts in part payment of new, with instant delivery and the Best guarantee.

In short, choose it from—



BIG TO-DAY'S LIST SENT POST FREE, INCLUDING THESE:

No.	h.p.		
10384.	2 1/2	1914 2-speed 2-stroke ALLON	£32 10
10385.	2 1/2	1913 2-speed DOUGLAS	£30 0
10386.	6	1912 ZENITH-GRADUA & Sc.	£47 10
10388.	2 1/2	1912 Single-speed DOUGLAS	£23 10
10390.	2 1/2	1915 2-speed WOLF-J.A.P.	£30 0
10391.	2 1/2	1910 Single-speed LEVIS	£32 0
10392.	3 1/2	1911 HUMBER and Sidecar	£15 0
10393.	1 1/2	1916 AUTO-WHEEL	£11 10
10395.	3 1/2	1915 ROVER, with Gradua gear	£43 19
10396.	2 1/2	2-speed FAFNIR	£12 10
10398.	3 1/2	1915 2-speed Twin ROYAL ENFIELD	£42 10
10402.	4 1/2	1915 GRANDUX	£37 10
10372.	6	1912 MATCHLESS and Sidecar	£40 0
10377.	2 1/2	1914 2-sp. TRIUMPH	£33 10
9740.	6	1914 3-sp. NEW HUDSON	£57 10
10373.	7-9	1913 2-sp. INDIAN and Sidecar	£50 0
10377.	3 1/2	1914 RUDGE Multi	£39 0
10341.	2 1/2	1913 2-sp. DOUGLAS	£35 0
10342.	1 1/2	1914 AUTO-WHEEL	£10 10
10353.	7-8	1916 2-sp. GARDEN Monocar	£50 0
10354.	4	1914 2-sp. BRADBURY	—
10356.	2 1/2	1915 2-sp. CALTHORPE-J.A.P.	£27 10
10357.	3 1/2	1914 Single-speed L.M.C.	£25 10
10318.	6	1912 2-sp. REX Sidette	£26 0
10320.	2 1/2	1915 2-sp. CALTHORPE-J.A.P.	£25 0
10322.	5-6	1914 RUDGE Multi and Sidecar	£40 0
10323.	3 1/2	1911 2-sp. DOUGLAS	£25 0
10324.	—	NEW IMPERIAL-J.A.P.	£25 0
10325.	3 1/2	Single-speed CENTAUR	£12 10
10330.	0	1914 3-sp. Chain Drive REX and Sidecar	£55 0
10332.	3 1/2	Single-speed BROWN	£15 0
10333.	3 1/2	1908 2-sp. TRIUMPH and S'car	£32 10
10335.	4-5	1915 2-sp. BAT	£52 10
10291.	3 1/2	1914 Norton, variable gear	£37 10
10300.	2	1914 2-sp. CALTHORPE Junior	£17 10
10301.	8	1913 BAYARD Light Car	£125 0
10302.	10	1915 RITZ Light Car	£110 0
10251.	2 1/2	1916 2-sp. ALLON	£35 0
10208.	10	1913 2-sp. HENDERSON & Sc.	£55 0
10271.	2 1/2	1915 2-sp. LEVIS	£37 10
10223.	2 1/2	1914 2-sp. 2-stroke CLYNO	£27 10
10221.	1 1/2	1915 J.E.S.	£20 0
10205.	3 1/2	2-sp. N.S.U.	£20 0
10200.	15	1915 TRUMBULL Light Car	£100 0
10172.	10	1914 2-sp. HENDERSON & Sc.	£55 0
70142.	3 1/2	1913 3-sp. SINGER	£32 10
10113.	20	1913 4-cyl. FORD	£67 10
10109.	3 1/2	1909 F.H. TRIUMPH	£25 0
10093.	3 1/2	1913 3-sp. ROVER Combination	£40 0
10087.	6	1914 4-cyl. Baby PEUGEOT Light Car	£97 10
10075.	6	BEDELIA Cycle Car	£25 0
10070.	6	1914 2-sp. ENFIELD Combination	£65 0
10068.	3 1/2	1912 QUADRANT, variable gear	£20 0
10021.	3 1/2	1912 SWIFT	£20 0
9940.	3 1/2	1914 3-sp. T.T. FORWARD	£29 0
9890.	3	1913 2-sp. twin ENFIELD	£35 0
9867.	2 1/2	1911 2-sp. ENFIELD	£22 10
9847.	4 1/2	1915 3-sp. QUADRANT	£42 10
9839.	3 1/2	1907 TRIUMPH and Sidecar	£22 10
9772.	3 1/2	1914 w-cooled 3-sp. HUMBER	£35 0
9633.	2 1/2	1912 PREMIER, variable gear	£18 10

**WAUCHOPE'S, 9, SHOELANE, FLEETST., LONDON**

'Phone 6777 Holborn. Wires: "Opifcer, London."

## DEFENCE OF THE REALM ACT

Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly, or mainly, of engineering or the production of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

Advertisers whose works are situated more than 30 miles from London can only have their announcements inserted with the approval of the Board of Trade, who will allocate to each advertisement a box number, and collect and distribute to the advertiser all replies received. The necessary forms of application can be obtained from any Labour Exchange or from the offices of this paper, and each advertisement must contain a clear reference to the effect that no person already engaged on Government work need apply.

## MOTOR CYCLES FOR SALE.

### A.J.S.

**A.J.S.** Lightweight, 2-speed, h.b.c. clutch, recently overhauled, new tyres; £24.—Gibb, Gough, London Rd., Gloucester. [1189]

**A.J.S.** 6 h.p., 3-speed countershaft, 2 new tyres, low sidecar, good order; £50.—Exall Bros., Chemists, Ellesmere Rd., Sheffield. [5622]

**1916** 6 h.p. A.J.S. Combination, with detachable wheels, and one 1916 2 1/2 h.p. A.J.S. in stock; list prices.—S. L. Taylor, Town Quay, Falmouth. [5224]

**A.J.S.** Twin, 2-speed, 5-h.p., canoelet sidecar, lamps, speedometer, many spares, in good going condition; £38.—25, Beaumont St., W. Mayfair 4808. [X9820]

**A.J.S.** 6 h.p. New Combination, 2-speed, £102/8; one 2 1/2 h.p. 3-speed, £58; one S.H. very little used 2 1/2 h.p. 3-speed, fully equipped, £45.—Dan Guy, Weymouth. [5847]

**A.J.S.** 1916 4 h.p. Combination, tools, spare valve, Lucas lamp, horn; £70; owner enlisted; seen by appointment.—Lloyd, Shepley Grange, Barnet Green, Worcestershire. [X0346]

**A.J.S.** 1916 4 h.p. Combination, fully equipped, new off January, done 1,000 miles; cost £110; reasonable offer accepted.—S. H. Wooding, 33, Garden Ar., Mitcham, Surrey. [5212]

**A.J.S.** Combination, 6 h.p., July, 1915, special engine, only done 800 miles, spare wheel, lamps, etc.; illness cause of sale; £90.—H.G., c/o Allcop, Offcotes Cottage, Ashbourne, Derbyshire. [X0251]

**1914** A.J.S. Combination, with back detachable wheel, Lucas horn and lamp, speedometer, sidecar lamp, screen, etc., in splendid condition; 60 gns.—Julians, Broad St., Reading. 'Phone: 1024. [X9884]

### Alldays.

**ALLON**, 1915 1/2, 2-stroke, countershaft gear, climb anything; £24.—Ashworth, Dursley, Glos. [X0451]

**2 1/2** h.p. Allon, 2-stroke, 2-speed model; price £32/10; guaranteed.—Wauchopes', 9, Shoe Lane, London. [X0321]

**COLMORE** Depot, 44, Finsbury Pavement, have all models Allon in stock. Easy payments arranged. [5842]

**COLMORE** Depot, 31, Colmore Row, Birmingham, can supply immediately all models of Alldays Allon. [0796]

**ALLDAYS** Allon, all models; immediate delivery; easy terms 2% extra.—Referee Cycle Co., 332, High Holborn. [0763]

**1916** Allon, new April, 2-speed, unscratched; 34 gns.—Troward, Heathurst, Vale of Health, Hampstead. [5869]

**1916** Allon, 2-stroke, 2-speed, Lucas lamps, horn, accessories; £33/10.—Osman, 60, Clinton Rd., South Tottenham. [5680]

**ALLON**, 1916 model, 2-stroke, 2-speed, new, perfect, not done 200 miles; 32 gns.—Bickerton, Jeweller, Stourport, Worcs. (D) [X0379]

**ALLDAYS** Allon, 1916, 2-stroke, splendid condition; £28, or nearest.—Rim. Rudall, D. Company, 105th Provisional Batt., Wimbledon. [5789]

**ALLONS**—All models from stock; deferred payments arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5671]

**ALLDAYS-ALLON**—All 2-stroke models from actual stock; exchanges arranged. Call or write.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5193]

## MOTOR CYCLES FOR SALE.

## Alldays.

**ALLDAYS** Allon, new April, 1916, scarcely scratched, lamp, horn, etc.; £37/10, or near offer; must sell. —Longman, 97, Fisherton St., Salisbury. [X0284]

**ALLON**, new 1916, 2½ h.p., 2-speed, chain and brake guards; cost £43, bargain, £37; perfect.—Shrimpton, 24, Battersea Rise, Clapham Common. [5616]

**ALLDAYS** Matchless, 3½ h.p., 1912½, Chater-Lea sidecar, just overhauled, but owner enlisted; £20, or near offer.—County Engineering Co., Hounslow. [5816]

## Ariel.

**ARIEL** 1916 5-h.p. Combination, in stock for immediate delivery.—Dan Guy, Weymouth. [5848]

**COLMORE** Depot, 261, Deansgate, Manchester, have in stock for immediate delivery all models of Ariel motor cycles, with or without sidecars. [0797]

**ARIEL**, 1913, 3½ h.p., 3-speed gear, complete with sidecar, lamps, horn, all in perfect order; bargain, no offers, £35/10.—Ellis, 360, Lillie Rd., Fulham, S.W. [5617]

**ARIEL**, 3½ h.p., 1912, semi-T.T., fast and flexible, multi gear, free engine, complete, this machine has just been overhauled and re-enamelled and plated by the makers at a cost of £12, and is honestly worth £35; accept £25, very genuine bargain.—Layton's Garage, Bicester, Oxon. [X0485]

## Auto-Wheels.

**UTO-WHEEL**, good condition; £7.—Loesch, Heathfield, Sussex. [X0504]

**WALL** Auto-Wheel, scarcely used; price £8.—Pierston, 6, Station Rd., New Banet. [5602]

**WALL** Auto-Wheel, Model de Luxe, practically new; £7.—Kershaw, Lonsdale Rd., Dorking. [X9944]

**14** h.p. Auto-Wheel, 1915, almost new; £11/10; guaranteed.—Vauchopps, 9, Shoe Lane, London. [X0319]

**UTO-WHEEL** De Luxe; £15/15, 28/3 monthly; converts any cycle to a motor.—Juno Showrooms, 248, Bishopsgate, London. [5570]

**UTO** Wheels, late 1914 model, three for sale, in splendid condition and running order; £7/10, £8/10, £9/10.—Murray's, 37a, Charles St., Hatton Garden, Holborn. [X0461]

**UTO-WHEEL**, B.S.A., Model de Luxe, attached cycle, lighting set, excellent condition, little used; bargain, £14, complete.—2, Outram Rd., Alexandra Park, Wood Green, N. [5608]

## Bat.

**BAT-J.A.P.** 1913 Combination, 6h.p., Bosch, 2 speeds, countershaft; £37/10, cash; easy terms quarter down secures machine.—Wandsworth Motor Exchange, Elber St., Wandsworth Town Station. [X0343]

**1914** 5-h.p. Bat-Jap, fitted with special racing engine, overhead valves, 2 speeds, clutch, lamps, speedometer, etc., the whole as new, ridden 1,500 miles only, 10-65 m.p.h. on high gear; £40.—Jones, Rutherford, Pampisford Rd., Croydon. [5584]

**BAT-J.A.P.** 1915 8h.p. Combination, spring frame, lamp, sidecar, all tyres 26x3, lamps, horn, etc. (machine as new), not been run for 6 months; death cause of selling; £70; good lightweight considered.—D. Strong, 154, Whalley New Rd., Blackburn. [5678]

## Blackburne.

**BLACKBURNE**, 3-speed, hand clutch, good running order; owner fighting; minimum, £25.—R. Young, Avenue, Hitchin. [5763]

## Bradbury.

**1913** Bradbury, 4h.p., 2-speed, first-class condition; £22.—Gillham, Midhurst, Sussex. [5679]

**BRADBURY**, 1913, 3½ h.p., 3 speeds, and sidecar; £21.—Percy and Co., 337, Buxton Rd., London. [5822]

**BRADBURY**, 2½ h.p., mag., B. and B.; £9/10.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [5628]

**BRADBURY** 1913 Combination, 4h.p., Bosch, 2 speeds, brand new tyres; sacrifice 28 gns.—1, Borne St., Wandsworth. [X0342]

**1913** 4h.p. Bradbury, Armstrong 3-speed, horn, tools, and spurs, also extra rear wheel, nice condition; £25.—R. Hawken, Okehampton. [X0469]

**OWNER** Called Up.—3½ h.p. Bradbury and sidecar, 1913, 2-speed, tyres and engine perfect; £28, or offer.—Brown, Gloucester Rd., Osterfield. [X0427]

**1913** Clutch Bradbury, N.S.U. gear, kick, accessories, Cowey, perfect, cane sidecar, £30; Rex 2-stroke part.—Hedges, 3, Cliveston Place, Paddington. [5846]

**BRADBURY** 4h.p. Combination, countershaft gear, chain-cum-belt, with high-grade coachbuilt sidecar, in perfect condition throughout; lowest 39 gns.—Egbert Spearman, Bishop's Stortford. [5608]

## Brown.

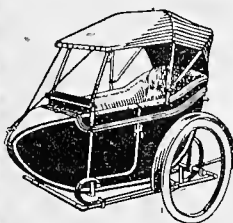
**3½** h.p. Brown, condition good; only £15; guaranteed £2.—Vauchopps, 9, Shoe Lane, London. [X0311]

**5½** h.p. Brown Coachbuilt Combination, 2-speed, handle start; exchange lower power; sell £30.—36, Wakefield Rd., Tottenham. [X0291]

**3½** h.p. Brown and small light sidecar, excellent running order; £20; privately owned.—Andrew's Garage, The Grove, Ealing. [5770]

## CORONET SIDECARS.

We are building special models for Harley-Davidsons, Excelsiors, and Indians, enamelled either grey or red to match machines, and fitted with 28 x 3in. tyre and four point attachment.



FROM

£10 15s.

Send for Illustrated Catalogue describing these well-known Sidecars.

EXCHANGES.

TRADE SUPPLIED

We can give Immediate Delivery of all models, and suitable for any make of machine.

## SIDECARS FOR HARLEY-DAVIDSONS, EXCELSIORS, AND INDIANS.

We make a special Sidecar, enamelled French grey to match, 28 x 3in. tyre, apron to cover entire body, and four-point attachment ..... £13 10 Immediate Delivery.

## 7-9 h.p. HARLEY-DAVIDSON.

11J, electrically equipped, 3 speed ..... £76 13  
11F, standard 3 speed model ..... £68 6  
Cash Offers Wanted

## CASH OFFERS WANTED.

4½ h.p. **STAR** Big Single, brand new, 3-sp., chain drive, kick starter, listed £68 5s. .... £55 0  
1916 7-h.p. **HARLEY-DAVIDSON** ..... £80 15  
1916 ditto, electrical model ..... £89 0  
7-h.p. **INDIAN**, 1915, electric model, with Millford £18 18s. Sidecar, screen ..... £75 0  
8 h.p. **ZENITH**, 1913, Zenith gear ..... £29 15  
2½ h.p. **WOLF**, 1916, 2-stroke, 2-speed ..... £33 10  
**A.C. Sociable**, 1912, hood, screen, 3 brass lamps ..... £45 0  
6 h.p. **REX**, 1912, 2-speed model ..... £25 0  
2½ h.p. **TYLER**, 1915, 2-speed model ..... £24 15  
3½ h.p. **TRIUMPH**, 1910 model ..... £18 15  
3½ h.p. **LINCOLN-ELK**, 1912 model ..... £15 15  
5 h.p. **INDIAN**, 1915, 3-speed, finished red, beautiful condition ..... £57 15  
4 h.p. **ZENITH**, 1912, variable gear ..... £25 0  
1913 **HUMBERETTE**, 8 h.p., hood, screen, 3 lamps, and speed wants attention ..... £39 0  
3½ h.p. **RUDGE**, 1912, free engine model ..... £19 15  
3½ h.p. **P. & M.**, 1909, 2-speed, chain drive, with Sidecar ..... £19 15  
5 h.p. twin **REX**, magneto, 2 sp., handle starting, spring forks ..... £13 15  
3 h.p. **LINCOLN-ELK**, 1911, magneto ..... £12 15  
3½ h.p. **TRIUMPH**, 1911, 2-speed model, with Sidecar, lamps, and horn ..... £23 15  
2½ h.p. **PREMIER**, 1912, 3-speed model ..... £20 15  
1915 **MORGAN**, 700 x 80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. .... £79 0  
3½ h.p. **HUMBER**, 1911, 2-speed ..... £17 15  
3½ h.p. **P. & M.**, 1912, kick starter ..... £27 15  
3½ h.p. **PREMIER**, 1911, B.S.A. 2-speed ..... £19 15  
1915 **TRUMBULL** Light Car, hood, screen, detachable wheels, speedometer, electric horn and lamps ..... £79 0

## MISCELLANEOUS.

New Complete Sidecar Chassis ..... £ 2 19 6  
New Coach-built Body, side door ..... 2 17 6  
New £5 Weatherproof Magneto single ..... 3 10 0  
Good Sidecar, complete ..... 1 12 6  
1916 Binks Carburettor. Your old carburettor taken in exchange.  
Speedwell Coach Sidecar, body just painted, screen; cost £14 ..... 7 15 0  
Speedwell Sidecar Chassis, with 2½ in. tyre New 2½ h.p. Petrol Stationary Engine, mag, 2 flywheels; listed £22 ros. .... 15 15 0  
£13 Burbury Coach Sidecar ..... 6 15 0  
Cane Sidecar, enclosed body ..... 3 15 0  
New Projectile Cane Sidecar ..... 8 5 0  
B. & B. Carburettor, h.b. control ..... 12 6  
Wanted to buy Lathe, about 6½ in. centres.

## BOOTH'S MOTORIES, PORTLAND PLACE, SKIRCOAT ROAD, HALIFAX.

Phone, 1062.

Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## Brown.

**3½** h.p. Brown, mag. ignition, good tyres, spring forks, 2 lamp, complete, fine running order; must sell; £12, or nearest offer.—Smith, c/o Annett's, 455, Green Lanes, Harringay, N. [X0349]

## B.S.A.

**B.S.A.**, new 1916 models H and K actually here waiting.—Moss, Wem. [X0387]

**COLMORE** Depot, 261, Deansgate, Manchester, for immediate delivery of B.S.A. [0798]

**B.S.A.**, 1912, 3½ h.p., 2-speed, N.S.U. wicker sidecar; £27/10.—22, Belgrave Rd., Wanstead. [X0255]

**B.S.A.** Models H and K in stock; immediate delivery.—Colmore Depot, 261, Deansgate, Manchester. [4664]

**LATE** 1914 3½ h.p. B.S.A., 3-speed, perfect condition; £42.—Apply, Edge, Timber Merchant, Craven Arms. [5647]

**COLMORE** Depot, 44, Finsbury Pavement, have all models B.S.A. and sidecars in stock. Easy payments arranged. [5840]

**B.S.A.**, 1915, 4½ h.p., 3-speed, tools, horn, no lamps, good condition, little used; £45.—Bailey, Station Rd., Ruddington, Notts. [X0441]

**B.S.A.**, new models.—I have a good stock of model H's and No. 2 sidecars; no waiting.—Hucklebridge, 133, Sloane St., London, S.W. [X0436]

**B.S.A.**, July, 1915, 4½ h.p., chain-cum-belt, 3-speed, under 700 miles; genuine bargain, £45.—Rees, Windsor House, Morriston, Glam. [X0285]

**B.S.A.**, 1915, 4h.p., chain-cum-belt, 3-speed, complete; accept £45, worth quite £50, cash only.—Layton's Garage, Bicester, Oxon. [X0486]

**B.S.A.'s**—We have models H and K in stock; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5667]

**B.S.A.**, 4½ h.p., 1916 K models in stock, chain-cum-belt, 3-speed, kick starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton, London. [X0366]

**1914** B.S.A. Chain Drive Combination, lamp, speedometer, waterproof apron, good condition throughout; lowest price £50, no offers.—Davey, 16, High St., Brentwood. [5709]

**B.S.A.**, 1916, 4½ h.p., models H and K; £62; ex-actual stock; exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Phone: 552 Mayfair. [5184]

**B.S.A.**, August, 1913, chain drive, 2-speed, new coach-built sidecar, hood and screen, lamps, everything new condition; a snip, £45, close offer considered.—184, Queen's Rd., Peckham, S.E. [X9943]

**B.S.A.**, 4½ h.p., chain drive, August, 1915, and Norton de Luxe sidecar, bought January, 1916. Lamps head and rear light, also horn, Cover, spare valves, etc.; can be seen by appointment.—P. Barrow, The Crescent, Leyland, Preston. [X0381]

**B.S.A.**, 1916, model K, 4h.p., chain-cum-belt, countershaft 3-speed, used once, guaranteed up, soiled and perfect; cost £62, must sell because of serious illness, accept £55; will transfer warranty.—Tollady, Hemingford, Bicester, Oxon. [X0487]

**B.S.A.**, 4½ h.p., chain drive, 3-speed countershaft, and B.S.A. best sidecar, 50 gns.; B.S.A., 1913, chain drive, 2-speed, and Gloria spring wheel sidecar, £35; B.S.A., 3½ h.p., free engine, condition like new in every way, £27/10.—Pitts, Stores, Redditch. [X0502]

**B.S.A.**, 1916.—We can deliver the famous model K from stock, the finest 4h.p. 3-speed countershaft machine on the market; price £62; exceptional exchange quotations, extended payment propositions of any reasonable character entertained. We are B.S.A. specialists, and our mechanics test and tune every machine before delivery.—Layton's Garage, Bicester, Oxon. Phone: 35. [X0494]

## Calthorpe.

**CALTHORPE-J.A.P.**, 2½ h.p., 2-speed model, brand new; £35, bargain.—Moss, Wem. [X0388]

**CALTHORPE-J.A.P.**, 2½ h.p., 1915, 2-speed, head and rear light, new condition; £22.—67, Wantage Rd., Reading. [X0297]

**COLMORE** Depot, 44, Finsbury Pavement, have all models Calthorpe in stock. Easy payments arranged. [5841]

**CALTHORPE-J.A.P.**, 2½ h.p., 2-speed Enfield rear, and clutch; £23.—Colmore Depot, Colmore Row, Birmingham. [X0203]

**CALTHORPE**, November, 1915, J.A.P. Enfield 2-speed, new condition; £28.—C., 270, Vauxhall Bridge Rd., S.W. [5701]

**CALTHORPE**, 1915, 2½ h.p., 2-stroke, 2-speed, good order; £23.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0480]

**CALTHORPE** Junior, 2-speed, only done 1,200 miles, absolutely as new; a bargain, £19/10.—Egbert Spearman, Bishop's Stortford. [5607]

**1915-16** Calthorpe-Jap, Enfield 2-speed, condition as new, lamp, horn, spares; £30 cash; owner called up.—Thomas, 82, Walcot St., Bath. [5610]

**CALTHORPES**, all models, from stock; deferred payments arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5668]

## MOTOR CYCLES FOR SALE.

## Calthorpe.

**CALTHORPE J.A.P.**, 1915, 2½ h.p., new 4 months ago; with all accessories; cost £40, £28 cash.—Seen by appointment, 248, Upland Rd., Dulwich. [5600]

**COLMORE** Depot, 31, Colmore Row, Birmingham, have in stock all models of Calthorpes for immediate delivery; also at our Manchester Depot. [0799]

**CALTHORPE**, 2½ h.p. J.A.P., with Enfield 2-speed gear, brand new, shop-soiled only; list £36/15, accept £25.—P. J. Evans, John Bright St., Birmingham. [X0399]

**CALTHORPE J.A.P.**, 2½ h.p., 1915, 2-speed, T.T. bars, speedometer, very fast, splendid order; £28.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

**CALTHORPE**, 1916, 2-stroke, 2-speed, variable ignition, new, but slightly shop-soiled; special bargain, £26 17/6.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [5641]

**CALTHORPE** Motor Cycles, 1916 models.—Just arrived: 2-stroke 2-speed 31 gns., J.A.P. 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [0777]

**CALTHORPE** Latest 1916 2-speed Models in stock; cash or exchange; no waiting. Also a few brand new 1915 models, slightly soiled, at reduced prices.—Eagles and Co., High St., Acton, London. [X0364]

**CALTHORPE J.A.P.**, late 1915, 2½ h.p., Enfield 2-speed, variable ignition, large X'Fall saddle, Stewart speedometer, Lucas horn, new spare belt, as new, ridden 345 miles only; £30/15.—Hucklebridge, 133, Sloane St., London, S.W. [X0433]

**CALTHORPES**, all 1916 models, ex actual stock, including the new 4 h.p. combination at 67 gns. Write or call for lists. Exchanges.—Mandev's Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5192]

**CALTHORPE**, brand new, a little beauty, 2½ h.p., 2-stroke, h.b. controlled mag., aluminium footboards, Moseley tyres, Druid forks; £28/16, or deposit £8 and 12 payments of 39/5, or the whole price 12 equal payments.—Seen at Juno Showrooms, 248, Bishopsgate, London. [5571]

**CALTHORPE**, new 1916 models, 2½ h.p. J.A.P. engine, 2-speed Enfield gear, £37/16; 2-stroke models, 2-speed, £28/17/6; 2½ h.p. single speed models, £32; also the sidecar combination, fitted with twin-cyl. 4-5 h.p. J.A.P. engine, 2-speed gear, handsome light coach-built sidecar, the combination 67 gns.; exchanges or easy terms arranged.—Wanchopes', 9, Shoe Lane, London. [X0315]

## Campion.

**CAMPION-VILLIERS**, 1915, 2½ h.p., exceedingly fine condition, overhauled, and guaranteed, lamp, horn; £22/10, genuine bargain.—Laytons' Garage, Bicester, Oxon. [X0490]

## Chater-Jap.

**4 h.p.** Single-cyl. Chater-Jap Coachbuilt Combination, P. and M. 2-speed, chain drive, 3 lamps, quantity spares, perfect condition; genuine bargain, £26.—A. Richards, Vale View, York Place, Risco, Mon. [5635]

## Chater-Peugeot.

**1913 T.T.** Chater-Peugeot, 5-h.p. twin, drip feed, drop frame, condition as new; £20; must be sold; no offers.—16, Haverstock Hill, Chalk Farm. [5738]

## Chater-Precision.

**1914 Chater-Precision**, 8 h.p., 3-speed countershaft gear, plate clutch, large coachbuilt sidecar, luggage carrier, hood, screen, speedometer, lamps, horns, etc., complete outfit in fine condition; £52.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [4926]

## Clyno.

**CLYNO** Combination, 1914, 6 h.p. twin, 3 speeds, detachable wheels; £45.—Percy and Co., 337, Euston Rd., London. [5828]

**1913 5-h.p.** Clyno Combination, fitted with 3-speed countershaft gear, spare wheel, lamp, horn, tools, etc., in splendid condition; £60; a snip.—F. E. Wootton, 55, High St., Oxford. [5839]

**CLYNO**, 1912, 5-h.p., with coachbuilt spring wheel sidecar room for child, 2-speed countershaft, free engine, kick starter, chain drive, lamps, horn, etc., splendid condition; £35.—Edwards, 95, Parchmore Rd., Thornton Heath. [X0397]

**CLYNO** 1914 6 h.p. 3-speed Combination, perfect condition, as new, very little used, £60; also 1914 6 h.p. Bar-Jap, 3-speed combination, condition perfect, £48; also 1916 4 h.p. R.S.A., model K, just received from works.—West, 42, Cranbrook Rd., Ilford. [X0356]

## Connaught.

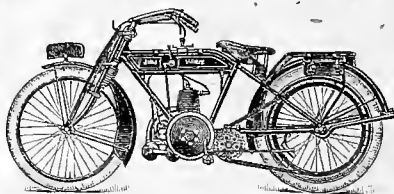
**1916 Connaught** Miniature, shop-soiled; £26.—Wilkins, Chapel Ash Depot, Welwyn-Chamption. [X0438]

**CONNAUGHT**, latest T.T. model; immediate; £36/17.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [5631]

**CONNAUGHT**, 1914, 2½ h.p., drip feed lubrication, all tools and accessories; £15.—Farrin, Chiddingle, Farnborough, Hants. [X0154]

**CONNAUGHT**, 1914, 3-speed, clutch, pedals, tyres new, all accessories, splendid condition; £30.—34, Market Place, Penzance. [X0236]

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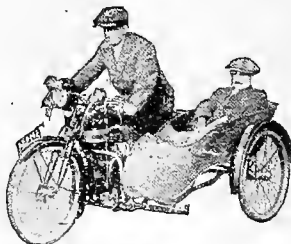
"I am pleased in every way with my **JUNO** motor. It has given me not the slightest trouble the whole twelve months I have run it, approximately 10,000 miles. The bearings are good as new, no shake anywhere, though the machine has done sidecar work for last eight months. It is and has always been the admiration of everyone who has seen and known it since I have had it."

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## Connaught.

**CONNAUGHTS** in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £28/17/6.—P. J. Evans, John Bright St., Birmingham. [X0400]

**CONNAUGHT**, 1915½, T.T., 2½ h.p., fully equipped, as new; best offer, or exchange 1914-15 Douglas, cash adjustment.—A.E., Rinkside, Pearlryn Rd., Kingston, S.W. [5861]

**CONNAUGHT**, 2½ h.p., 3 speeds, clutch, kick starter, bought 15th August, splendid condition, under 1,000 miles, smart, silky running mount, will take light sidecar; price £30, lowest, or would exchange higher power combination, not earlier than 1914.—Lieut. B., R.A.M.C., Frenches, Redhill. [5844]

## Corah.

**6 h.p.** Corah-Jap, Jardine 4-speed, all accessories, Turner coachbuilt sidecar, hood, screen; £50.—180, Turners Hill, Cheshunt, Herts. [5852]

## Coventry Eagle.

**COVENTRY** Eagle, 1916, 2-stroke, 2 speeds, as new, run 300 miles; 30 gns.—Percy and Co., 337, Euston Rd., London. [5826]

## Dayton.

**1915 2-stroke** Dayton, £15/10; also 1914 2-stroke Dayton, £13/10; excellent condition.—18, Archer St., Notting Hill, London. [5854]

## Dot.

**8 h.p.** Dot-Jap, special, o.h.v., 2-speed, chain drive, in perfect condition; must sell; £50, no offers entertained.—Stringer, High St., Fenton, Stoke-on-Trent. [X0437]

## Douglas.

**DOUGLAS**, 1911, overhauled, fast; £18/10.—103, Myddleton Rd., Bowes Park. [5716]

**COLMORE** Depot London Agency for immediate delivery of Douglas latest models. [5843]

**DOUGLAS**, 1914, T.T., good condition; £35.—Howard, 39, Oxford Rd., Putney. [5711]

**DOUGLAS**, 1913, 2½ h.p., 2-speed, kick starter; £31/10.—Clifford's Garage, Sidcup. [5833]

**DOUGLAS**, 4 h.p., 3-speed, Douglas sidecar, 1915, fully equipped; £55.—Dan Guy, Weymouth. [5849]

**1912 Douglas** 2½ h.p. Motor Cycle, just overhauled; bargain, £24.—R. J. Simpson, Lazonby, Cumbria. [X0219]

**2 h.p.** 1913 2-speed Douglas, completely overhauled; £30; guaranteed.—Wanchopes', 9, Shoe Lane, London. [X0322]

**1911 2½ h.p.** Douglas, engine newly overhauled, tyres good, complete; accept £15.—30, Talbot St., Burnley. [X0459]

**DOUGLAS**, 1913, fine condition, 2-speeds, very fast, electric lighting, accessories; £50.—S. 41, Ash Rd., Stratford. [5698]

**DOUGLAS**, 1914, perfect condition, model W; £38.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [5632]

**1913 Douglas**, 2-speed, just overhauled, excellent order; £28.—Blencathra, Highfield Rd., Walton-on-Thames. [X0417]

**DOUGLAS** 1912, £26; 1914, £35; both in grand order; any trial.—Colmore Depot, 31, Colmore Row, Birmingham. [X0207]

**DOUGLAS**, 1912, 2-speed gear, footboards, kick starter and clutch; £28.—Colmore Depot, Colmore Row, Birmingham. [X0209]

**DOUGLAS**, 1911, T.T., fast, reliable, splendid condition; £19; exchange 3½ h.p.—Davies, Frlsham, Hense, Uttroster. [X0225]

**DOUGLAS**, 1914, Lady's model, in perfect order in every detail; £35/10.—Colmore Depot, Colmore Row, Birmingham. [X0210]

**DOUGLAS**, 2½ h.p. T.T. model, new Oct., 1915, lamp, horn, tools, speedometer, fine order; £42.—Knappe, Burnley. Tel.: 581. [X0509]

**2 h.p.** 1912 Single Speed Douglas, thoroughly overhauled; £23/10; guaranteed.—Wanchopes', 9, Shoe Lane, London. [X0323]

**DOUGLAS**, 1914, T.T., 2-speed, electric light and horn, perfect condition, accessories; £34.—16, Camden Rd., Wanstead. [5706]

**DOUGLAS**, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas.—McFarr, Yeovil. Tel.: 50. [5855]

**DOUGLAS**, late 1913, 2-speed, clutch, kick starter, footboards, heavy Dunlops, accessories, excellent condition; £35.—Moss, Wey. [X0589]

**DOUGLAS**, 2½ h.p., 2-speed, kick start, clutch model, lamps, Jones speedometer; £30, near offer; bargain.—34, Ashvale Rd., Tooting. [5677]

**DOUGLAS** Motor Cycle, 2½ h.p., 1914, good order, Lucas lamp and horn; £36, or offer.—50, West End Lane, West Hampstead, N.W. [X0223]

**DOUGLAS** 2½ h.p. Lightweight, 2-cyl., fast and economical, new head lamp; £18/10, or near.—69, Ashburton Av., East Croydon. [5785]

**DOUGLAS**, 1911 (red), 2½ h.p., low, long exhaust; trial, appointment; £14, bargain; enlisting.—Thorogood, High St., Aveley, Essex. [5845]

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 Exchanges quoted. Easy Payments arranged.  
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**DOUGLAS**, 2½ h.p., magneto, spring forks ..... £14 10  
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 At Mudersheim, cost 21/7, take ..... 17/6  
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 3-wheel Cycle Car Chassis, 26" × 2½ wheels ..... £3 15

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**DOUGLAS**, 3½ h.p., 2-speed gear, kick starter, and clutch; grand sidecar or solo mount; £43.—Colmore Depot, Colmore Row, Birmingham. [X0204]

**DOUGLAS**, 2½ h.p., 1914, new condition, inclusive lamps and tools; £36, absolute lowest; owner at Front.—Ashdene, March, Cambridgeshire. [X0506]

**DOUGLAS**, 1914, 3½ h.p., clutch model B, 2-speed, kick starter, fast machine, guaranteed in perfect order; £44.—White, Fuller, 3, Stanhope Av., Finchley. [5714]

**DOUGLAS**, 1914, 2½ h.p., T.T., in nice condition, £38; a 1913 at £31; a 1914 at £35, standard model, 2 speeds.—Percy and Co., 317, Euston Rd., London. [5823]

**DOUGLAS**, 2½ h.p., T.T., 1914, 2 lamps, and generator. Lucas, excellent condition, tyres good, complete spares; £38.—Cadet Hunt, c/o Southey's Garage, Berkhamstead. [X0229]

**DOUGLAS**, Oct., 1913, T.T., stored since the outbreak of war, in new condition, all lamps and spares; £37/10.—Oram, 20, Caddington Rd., Cricklewood, London. [5733]

**COLMORE** Depot, Birmingham, Manchester, Leicester, and Liverpool, have in stock complete range of all models Douglas for immediate delivery, also full range of spares. [0800]

**DOUGLAS**, all black, W.D., only ridden few hundred miles, good as new, Stewart horn, 60/- lamp set, tools, mudshield, spares, and overalls; £52.—Beadsmoore, Goldsmith St., Mansfield. [X0288]

**DOUGLAS**, 1911, new T.T. bars, mudguards, tyres, toolbags, and footboards, frame renovated, engine excellent condition, fast, good climber; trial; £21.—J. Linney, Rugeley Rd., Chase Terrace, near Walsall, Staffs. [X9942]

**DOUGLAS**.—We have usually in stock second-hand Douglases from 1911 to 1915; prices £20 to £47. Write for list, or better call.—Mauds' Motor Mart, 100 and 136, St. Portland St., London, W. Tel.: 552 Mayfair. [5186]

**DOUGLAS** Agents and Specialists.—It is difficult to obtain immediate delivery of new Douglas motor bicycles. We do not state we can supply in all cases from stock, but we solicit enquiries for these famous machines, and orders will receive our best attention and every effort will be made to execute same. Tel.: 388  
 Telegrams: Bicycles.—Robinson's Garage, Green St., Cambridge. [5802]

### Edmund.

**EDMUND** Spring Frame Lightweight in stock; £46/4.—Sole agents, Marston, 26 and 31, Bridge St., Chester. [X0293]

### Elswick.

1914 3½ h.p. Elswick Combination, 3 speeds, perfect condition.—93, Douglas Rd., Tolworth, Surbiton. [5735]

### Elmdon.

1915 2-stroke Elmdon Villiers, in perfect order and condition, mechanical horn and lamp; £20.—Lewin, Wadcroft, Kettering. [X0439]

### Enfield.

**ENFIELD** New 1916 Combination in stock waiting; enquiries invited.—Moss, Wem. [X0390]

**COLMORE** Depot, 31, Colmore Row, Birmingham, for immediate delivery of Enfields. [0801]

**ENFIELD**, 1914, 2½ h.p., 2-speed twin, good condition; £25.—Morris, 139, Finchley Rd., N.W. [X0149]

1915 6 h.p. Royal Enfield, little used, spares; £55, bargain.—N. J. Taylor, Maderly, High St., Wey. [X0359]

**ENFIELD** 2½ h.p. Twin, first-class condition throughout; bargain, £13/13.—Egbert Spearman, Bishop's Stortford. [5605]

**ENFIELD** Lightweight, 2-speed and free, perfect, all accessories, etc.; any trial; cheap.—497, Old Ford Rd., Bow. [X0257]

**ENFIELD** 6 h.p. Combination, new, latest 1916 model, actually in stock; price 85 gns.—The Morris Garages, Oxford. [0811]

**ENFIELD** 3 h.p. Twin, 1915, run 2,000 miles, perfect; £39/10.—E. J. Hamston, Marlborough Villa, Cheltenham, Mon. [X0290]

**ALMOST** New Late 1914 3 h.p. Enfield 2-speed Motor Cycle, all accessories.—To be seen at Hunsards, Ingatstone, Essex. [5323]

**ENFIELD** 1915 Combination, 6 h.p., almost like new; exceptional condition; £60.—Percy and Co., 337, Euston Rd., London. [5825]

2½ h.p. Royal Enfield, 2-speed gear machine, twin engine, blue finish; £25; guaranteed.—Wanchopes, 9, Shoe Lane, London. [X0317]

**ENFIELD**, 1916, 3 h.p., latest model, just arrived from works; £52/10.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [5645]

**ENFIELD** Combination, 6 h.p., 1914, speedometer, lamps, etc.; expert examination; trial, 50 gns.—Hill, 117, Branson St., Birmingham. [X0412]

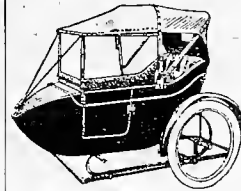
**ENFIELD** 1914 Combination, lamps, horn, speedometer, and all accessories, perfect condition; £60.—Clark, 32, Albert Rd., Dalston, London. [5674]

1914 Enfield Coachbuilt Combination, 6 h.p., speedometer, watch, lamps, etc.; £55; splendid condition.—Taylor, Joiner, Oakes, Huddersfield. [5581]

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Built throughout in our own factory.

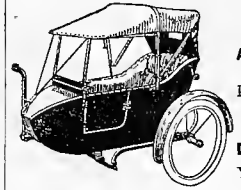
Farlow Sidecars have that pleasing style, exquisite finish, and lasting qualities which are the buyers' ideal.



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Underlung Chassis with Luggage Carrier combined.

Splendidly made and built for hard work.  
 £11 0 0  
 Hood ..... £2 4  
 Screen ..... £1 0



This is MODEL No. 2.

A BEAUTIFUL LIGHT SIDECAR.

PRICE ..... £10  
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 Delivery from Stock.  
 Your Agent will supply

## The following New Models are all in Stock:

1916 4 h.p. A.J.S. Combination, interchangeable wheels ..... 90 gns.  
 1916 6 h.p. A.J.S. Combination ..... 98 gns.  
 1916 6 h.p. **ENFIELD** Combination ..... 85 gns.  
 1916 8 h.p. **ENFIELD** Combination ..... 87 gns.  
 1916 6 h.p. **J.H. Combination** ..... 90 gns.  
 1916 6 h.p. **NEW HUDSON** ..... 72 gns.  
 1916 6 h.p. **NEW HUDSON** Combination ..... 88 gns.  
 1916 2½ h.p. **NEW HUDSON**, 2-sp., 2-stroke ..... 38 gns.  
 1916 2½ h.p. **OMEGA-J.A.P.**, 2-speed ..... 38 gns.  
 1916 2½ h.p. **OMEGA**, 2-stroke, 2-speed ..... 38 gns.  
 1916 5-6 h.p. British **EXCELSIOR**, Sturmer countershaft 3-speed gear ..... 68 gns.  
 1916 4½ h.p. British **EXCELSIOR**, Sturmer countershaft 3-speed gear ..... 64 gns.  
 1916 **FORD** Touring Car, 20 h.p. .... £135 0  
 1916 **FORD** Chassis, 20 h.p. .... £115 0  
 1916 **FORD** Van, 20 h.p. .... £130 0  
 1916 20 h.p. **FORD** Ambulance ..... £135 0  
 1915 12 h.p. **TRUMBULL** Cycle Car, 4-cyl., water-cooled, detachable wheels, all on £120 0

## CASH OFFERS WANTED.

4 h.p. **BRADBURY**, 2 speeds, and sporting Sidecar ..... £20 0  
 3½ h.p. **HUMBER**, 2 speeds, fine goer ..... £20 0  
 4 h.p. **BRADBURY**, single gear, and Sidecar ..... £15 0  
 1914 6 h.p. **ENFIELD** Combination, two horns, lamps, etc., very smart ..... £62 0  
 1913 **SCOTT**, lamp, speedometer, etc. .... £30 0  
 3½ h.p. **ROVER**, 1913, 3-speed ..... £29 0  
 1913 **WOLF**, lightweight, 3-speed ..... £25 0  
 2-speed **RADCO**, 2-stroke, fine condition ..... £25 0  
 2-stroke **OMEGA**, Druid forks ..... £19 0  
 1914 **DOUGLAS**, 2-speed, fine machine ..... £36 0  
 3½ h.p. **M.S.U.**, spring frame, 2-speed ..... £17 0  
 3½ h.p. **TRIUMPH**, 1911, clutch model ..... £22 0  
 3½ h.p. 1908 **TRIUMPH**, fine goer ..... £17 0  
 3½ h.p. 1909 **REX** de Luxe, 2-speed, handle starting ..... £19 0  
 1913 **FORD**, English body, Bosch magneto, disc wheels ..... £34 0



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Fully Guaranteed.  
 25/- each.

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Nice Coach-built Sidecar ..... £4 0  
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 New 650 × 65 Dunlop Rubber-studded Covers ..... 22/6  
 8-10 h.p. Precision Engine, quite new. What Offers? .....  
 6 h.p. Twin Antoinette Engine, water-cooled ..... £6 0  
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 F.R.S. Lamp Set, 500 beam, shop-soiled ..... 35/-  
 F.R.S. Lamp Set, 1,000 beam, shop-soiled ..... 45/-  
 New (Lincher Clearance Covers, de Luxe, "heavy," rubber-studded .26×2½, 26×2½, 26×2½, and 26×2½×2½ ..... each £1 0

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Hopwood Lane, HALIFAX.



## MOTOR CYCLES FOR SALE.

## Enfield.

ENFIELD.—All models delivered from stock; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5670]

1913 6h.p. Enfield Combination, in good running order, spares, etc.; £45; between 5 p.m. and 8 p.m.—15, Oberstein Rd., Clapham Junction, S.W. [5634]

8h.p. 1915 Enfield Combination, 700x80 Palmers, speedometer, horn, lamps, hood, screen, mudshields, spares, first-class condition; trial.—Gee, Studley. [X0152]

ENFIELD Combination, 1914, with hood and screen, 3 lamps, first-class condition throughout; £60.—Lieut. Barron, Hospital, Dudley Rd., Birmingham. [X0153]

ENFIELD, 2-stroke, 1915½, 2-speed, free engine, excellent condition, as new; £32, bargain; offers.—Lieut. Tregunna, 3rd R.W.F., Rockferry, Cheshire. [X9946]

ENFIELDS actually in stock for immediate delivery, 4 h.p. combinations, 3h.p. and 2½h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [X0398]

3h.p. Royal Enfield Twin, 2-speed, and free engine model, 1915 machine, complete with all accessories; £42; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X0332]

ENFIELD, 1916, 2-stroke, 2½h.p., 2-speed, and free engine, latest model, just arrived from works; £42.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [5644]

ENFIELD 1916 6h.p. Combination, latest model, just arrived from works; immediate delivery; £89/5.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [5646]

ROYAL Enfield Latest 1916 6h.p. Combination, excellent actual stock; £89/5; exchanges arranged.—Mandess' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5886]

ENFIELD, late 1914 6h.p. combination, 2-speed, lamps, horn, speedometer, hood, screen, in good condition, just overhauled; £65.—H.E.C., St. Helier's, Marine View, Kingsway, Hove. [5611]

1914 6h.p. Enfield Combination, coachbuilt sidecar, luggage grid, horn, 3 lamps, tyres nearly new, just overhauled, excellent condition throughout; price £60.—Whiting, Kingsdown, Sevenoaks. [5673]

ENFIELD 1915 5h.p. Twin, kick starter, lamps, horn, full tools, run under 1,500, excellent all-round condition, low petrol consumption; £43, no offers.—Lieut. Hope Gill, The Castle, Monmouth. [X9573]

ENFIELD 1912 6h.p. Coachbuilt Combination, chain drive, 26x3in. new Pedley back tyre, Jones speedometer, Lucas lamps, etc., in excellent condition; £38.—The Premier Motor Co., Aston Rd., Birmingham. [5896]

1916 Enfield, 3h.p., 2-speed, kick starter, Stewart speedometer, lamp and horn, Palmers unpunctured, done 600, all as new; £48; owner going to sea.—Assistant Paymaster Murphy, Naval Depot, Inverness. [X0282]

ENFIELD 1916 Combinations.—We have them in stock; cash price £89/5. Exceptional exchange quotations; extended payment propositions of any reasonable character entertained.—Layton's Garage, Biester, Oxon. [X0489]

ROYAL Enfield, 3h.p., 1915 T.T. roadster, with accessories, only used 700 miles, in excellent order; 42 gns.; owner well-known motorist.—Can be viewed and tried A. C. Hills and Co., 10a, Parsons Green, S.W. Tel.: Putney 2099. [5692]

## Excelsior.

EXCELSIOR, 1914, 7½h.p., 2-speed, new tyres, Lucas accessories; £42; just overhauled.—Llewellyn, 23, Tavistock Sq., W.C. [5676]

EXCELSIOR 7½h.p. 1916 Combination, 3 speeds, indistinguishable from new, run 400 miles, perfect order; £60.—Percy and Co., 337, Euston Rd., London. [5824]

## Fafnir.

FAFNIR, 3½h.p., clutch model, perfect condition, new tyres; with bargain, £15.—74, Handcroft Rd., Croydon. [5665]

3½h.p. Fafnir Engine Motor Cycle, fitted with coachbuilt sidecar, any severe trial allowed; £15; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X0333]

MOTOR Cycle, Fafnir, 3½h.p., and sidecar, 2-speed, free engine, in very good condition; trial; just overhauled; £25.—Parvin, Bulder, Mill Hill. [5685]

## Forward.

2½h.p. Forward, T.T. model, fitted with 3-speed gear, twin engine; £29; guaranteed.—Wauchope's, 9, Shoe Lane, London. [X0328]

## F.N.

F.N., 1914, 5-Chp., 4-cyl., Bosch, 2 speeds, clutch; £38/10.—68, Elmfield Rd., Wandsworth. [X0347]

F.N., 1912, 4-cyl., 2-speed, clutch, just overhauled, and Millford Empire coachbuilt sidecar; £28.—7, Pembroke Rd., Norwich. [5787]

## Grandex.

3½h.p. 1915 Grandex, Enfield gear, good solo or sidecar machine; £35.—Wauchope's, 9, Shoe Lane, London. [X0314]

1915-16 Grandex-Precision, 6-h.p., Enfield 2-speed, luxurious coachbuilt combination, every conceivable accessory, including Cowey, mechanical horn, hood, wind screen, etc.; cost £110; under 2,500 miles; sacrifice £57/10.—Osborne, Romney Lodge, 177, New Park Rd., Brixton. [5660]

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## New Models in Stock.

Model G.	7	h.p. twin <b>INDIAN</b> , 3-sp. gear, rigid frame .....	£75	0	
"	F.	7	h.p. twin <b>INDIAN</b> , 3-sp. gear, spring frame .....	£83	0
"	F.	7	h.p. twin <b>INDIAN</b> , 3-sp. gear, spring frame .....	£90	0
"	B.	5	h.p. twin <b>INDIAN</b> , 3-sp. gear, kick starter .....	£70	0
"	K.	4½	h.p. <b>B.S.A.</b> , 3-speed counter- shaft gear, kick starter .....	£62	0
"	H.	4½	h.p. <b>B.S.A.</b> , 3-speed counter- shaft gear, kick starter .....	£64	0
"	rso.	6	h.p. <b>ALLDAYS ALLEN</b> , 2-str sidecar .....	£42	0
"	II.	2½	h.p. <b>ROYAL ENFIELD</b> Side- car Combination .....	£89	5
"		2½	h.p. <b>GOVENTRY EAGLE</b> , 2-stroke .....	£44	2
"		2½	h.p. <b>CALTHORPE-J.A.P.</b> , Enfield 2-sp., vari. ignition .....	£37	16
"		2½	h.p. <b>CALTHORPE</b> lady's, 2-stroke, variable ignition .....	£35	14
"		4	h.p. <b>CALTHORPE</b> Light- weight Combination, handle starter, complete with high- ly finished coach-built S'car .....	£70	7
"		2½	h.p. <b>RADCO</b> , 2-stroke, with Albion 2-speed c/shaft gear .....	£35	0
"		2½	h.p. <b>LEVIS</b> , 2-stroke .....	£32	0

## New 1915 Models in Stock.

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## All Brand New Machines.

2½	h.p.	CALTHORPE-J.A.P., 2-sp., fixed ign.	£34
2½	h.p.	CALTHORPE-J.A.P., 2-sp., vari. ign.	£35
2½	h.p.	NEW IMPERIAL-J.A.P. light tourist, single-speed, variable ignition	£30

## Second-hand Guaranteed Machines.

1915	3	h.p.	LINCOLN-ELK	£27
1913	2½	h.p.	DOUGLAS, 2-speed	£37
1914	3½	h.p.	ARIEL, 3-speed	£39
1913	6	h.p.	MATCHLESS, 3-speed	£39
1914	7	h.p.	INDIAN road racer, accessories	£42
1914	2½	h.p.	DOUGLAS, lady's model	£42
1915	3½	h.p.	INDIAN, 3-speed, twin-cylinder	£45
1914	7	h.p.	INDIAN, 2-speed, elec. equipped	£48
1914	7	h.p.	INDIAN, 2-speed, 1916 pattern kick starter	£50
1914	7	h.p.	HENDEE Special, elec. equipped Or with coach-built Sidecar	£50
1915	7	h.p.	INDIAN road racer	£52
*1914	8	h.p.	90 bore ZENITH, Gradua gear, Canelet coach-built Sidecar and access.	£55
1915	5	h.p.	INDIAN, 3-speed	£56
1915	5	h.p.	INDIAN, 3-speed	£56
1915	7	h.p.	INDIAN, 3-speed, kick starter. Or with coach-built Sidecar	£78
1915	7	h.p.	INDIAN, 3-speed, elec. equipped	£64
*1915	7	h.p.	INDIAN, 3-speed, kick starter, and Indian coach-built Sidecar, as new.	£75
1915	7	h.p.	INDIAN, 3-speed, kick starter, elec. equipped, Empress coach-built S'car	£75
*1915	7	h.p.	INDIAN, 3-speed, kick starter, elec. equipped, Indian coach-built Sidecar	£78
*1915	7	h.p.	MATCHLESS, M.A.G. eng., 3-sp. gear, kick starter, and Matchless coach-built Sidecar, complete with all accessories	£85

\*Sidecar combinations.

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208, Gt. Portland St.  
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Write for full list of Motor  
—Cycles and Light Cars.—  
**EXCHANGES. EASY TERMS.**

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## Harley-Davidson.

BRAND New Harley-Davidsons.—See below.

MODEL F. 7-9h.p., 3-speed; £68.—The Premier Motor Co.

MODEL J. 7-9h.p., 3-speed, with dynamo electric lighting outfit; £75.—The Premier Motor Co.

THE Above are guaranteed brand new; standard specification and standard equipment.—The Premier Motor Co., Birmingham.

SPECIAL Gloria Sidecars, to match; 19 and 25 gns. You save £17 by purchasing your new combination direct from the recognised H.D. experts. Delivery carriage paid to any address.—The Premier Motor Co., Aston Rd., Birmingham. [4467]

HARLEY-DAVIDSON'S, 1916 models; immediate delivery from stock.—Colmore Depot, 261, Deansgate, Manchester. [4667]

1915 4½h.p. Harley-Davidson, only run 2,079 miles, speedometer, lamps, unscratched; £41.—Crow Bros., Guildford. [5092]

HARLEY-DAVIDSON, 1916, 16F, and special Millford sidecar; £100; in stock.—Marston, 26 and 31, Bridge St., Chester. [X0304]

HARLEY-DAVIDSON, 7-9h.p., 1915, Swan sidecar; seen any time, nearest offer £65.—Phillips, 8, Grand Parade, Haringay, London. [5769]

HARLEY-DAVIDSON, 1915, 11J model, just been overhauled by makers; £68, bargain.—Colmore Depot, Colmore Row, Birmingham. [X0205]

1915 7-9h.p. Harley-Davidson and Millford Empress sidecar; £68/10—seen by appointment.—Wilkinson, 6, Dewhurst Rd., Brook Green, W. [5613]

COLMORE Depot, Birmingham, Manchester, Liverpool, Leicester, for immediate delivery of all models of Harley-Davidsons and spare parts. [0802]

HARLEY-DAVIDSON, 1915, 7-9h.p., 3-speed, model 11F, in practically new condition; £55, bargain.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

HARLEY-DAVIDSON, 1915, model 11F, mileage 1,000, also H.D. sidecar (Feb., 1916), mileage 200, the whole combination as new, with full equipment; £75.—Charles Walker, 43, Clifton Hill, N.W. Hamp. 5164, after 6 p.m. [X0220]

## Henderson.

1914 Henderson, 4-cyl., 2-speed, C.B. combination; £60.—10, Montpelier Rise, Golden's Green. [5715]

## Hobart.

HOBART, single speed, in stock; £31/10.—Marston, 26 and 31, Bridge St., Chester. [X0295]

HOBART, 2-speed, in stock; £37/16.—Marston, 26 and 31, Bridge St., Chester. [X0296]

HOBART, 2-stroke, 2-speed, 1915, run 300 miles only; must sell; best offer.—Paterson, Percival Parade, Worcester Park. [5720]

HOBART-VILLIERS, 1915, 2½h.p., a very sturdy little mount; accept £21, real bargain.—Layton's Garage, Biester, Oxon. [X0491]

## Humber.

3½h.p. 1911 Humber and sidecar; £15/10.—Wauchope's, 9, Shoe Lane, London. [X0329]

HUMBER, 1913, 3½h.p., 2-speed, handle starter, underslung sidecar; £26.—29, St. Leonard's St., Bow. [X5725]

6h.p. Humber Twin, 2-speed and free; will exchange lower power, or sell £23.—44, Embankment Rd., Plymouth. [X0411]

HUMBER, 3½h.p., 3-speed Sturmeys gear and clutch, grand order; £30.—Colmore Depot, Colmore Row, Birmingham. [X0212]

3½h.p. Humber, 2-speed, handle starter, and Canelet 2 sidecar, absolute good condition; 30 gns.—Grocer, 30, Park Av., East Ham. [X0444]

1913 3½h.p. Humber, 2-speed, free, handle starting, sidecar, 24 gns.; 1912½ countershaft Douglas, 19 gns.—71, Nursery Row, Walworth, S.E. [X0452]

HUMBER, late 1911, 3½h.p., 2-speed, new Palmer tyres, Montgomery torpedo sidecar, lamp, horn, and tail lamp, excellent condition; £20.—The Premier Motor Co., Aston Rd., Birmingham. [5897]

HUMBER, 1914, 3½h.p., 3-speed combination, Lucas accessories, spare lamp set, 2 handle-bars, a neat, handy machine, in fine condition; £45, or £38 solo, or offers.—Letters, 40, Chumtler Rd., Custom House, E. [X0360]

HUMBER, 3½h.p., 2-speed, free engine, handle starter, excellent condition, recently overhauled by makers, with coachbuilt sidecar and screen, accessories; bargain, £27.—Smith, 82, Woodhouse Rd., Leytonstone. [5761]

## Indian.

INDIAN, new 1916, 5h.p. model, actually in stock.—Moss, Wem. [X0391]

INDIAN, 1910, 5-h.p., good condition; £18.—Morris, 139, Finchley Rd., N.W. [X0161]

INDIAN, 5-h.p., clutch model, splendid order throughout; £22.—Speckley, 45, Church Rd., Acton. [5744]

INDIAN, 1913, 7-9h.p., 2-speed, clutch model; must sell; £28.—Parker, Thrintoft, Northallerton. [5686]

## MOTOR CYCLES FOR SALE.

## Indian.

INDIAN, 5h.p., clutch model, complete with accessories; £19/10.—Colmore Depot, Colmore Row, Birmingham. [X0215]

INDIAN, 1916, 7-9h.p., T.T. clutch model, run 1,000 miles; only £58.—16, Longton Grove, Sydenham, S.E. [X0249]

INDIAN, 7-9h.p., very fine combination, late model, complete outfit; £60.—Scrase, 234, Battersea Park Rd., S.W. [5780]

1915 (late) T.T. Indian, excellent condition, light 2-stroke sidecar; bargain, £48.—29, High St., Malden, Essex. [X0234]

INDIAN, 7-9h.p., 2-speed, and special Millford sidecar; £55; newly new.—Marston, 26 and 31, Bridge St., Chester. [X0303]

INDIAN M.C. and Sidecar, 1915, 5-6h.p., new 4 months ago; £60.—Seen by appointment, 248, Up-land Rd., Dulwich. [5599]

WAR Bargain.—1915 3½h.p. Indian, T.T., 3 speeds, kick, new 1916, mileage 2,000; £45.—Reynolds, Wimbington, Cambs. [5621]

INDIAN, 5h.p., clutch model, 1915, complete with special lamp and horn; £39.—Colmore Depot, Colmore Row, Birmingham. [X0214]

1914 Indian Combination, 2 speeds, clutch, speedometer, fine condition; any trial; £50.—Mallet, Cramlington, near Newcastle. [5762]

INDIAN, 1915, 7-9h.p., road racer, clutch, special fast engine; £40.—Elce and Co., 15-16, Bishops-gate Av., Camomile St., E.C. [0492]

INDIAN Combination, 1915, 3 speeds, kick starter, in real nice order and condition; £60.—Percy and Co., 337, Euston Rd., London. [5829]

INDIAN, 5h.p., 1916, 3-speed, Lucas lamps, all complete, speedy, nearly new, guaranteed; £59.—3 Abbotsford Av., South Tottenham. [5614]

INDIAN, 1914, 7-9h.p., T.T. model, clutch, extra fine condition, speedometer, mechanical horn; £35.—Layton's Garage, Bicester, Oxon. [X0488]

INDIAN, late 1914, 7-9h.p., 2-speed, new Canoelet sidecar, spring frame, extras, splendid condition; £70, or offer.—St. James's Vicarage, New Cross, S.E. [X0286]

7h.p. Indian, model F, power plus, 1916, 3 speeds, speedometer, with luxurious sidecar, never been used, less than cost.—Ayscough, Penarth Hotel, Penarth, (D). [X0216]

INDIAN, 7-9h.p., late 1914, luxurious sidecar, first-class condition, splendid turnout, electric equipped, tyres nearly new; £48.—10, Dayton Gardens, Eding. London. [5648]

LATE 1915 Indian 7h.p. Combination, fitted with electric lighting, etc., hood, wind screen, all accessories; cost £110, as new, accept 70 gns.—30, Talbot St., Biraley. [X0457]

INDIAN 3½h.p. Late 1914 Combination (unprecedented bargain), spring frame, 2 speeds, kick starter, electric equipment, speedometer, and accessories; £45.—1a, Eding Common. [5615]

INDIAN, October, 1914, 7-9h.p., 2 speeds, kick start, electric lighting, horn, 3 lamps, Millford 20 gns. sidecar, all new condition; best offer over £40.—34, Ash-vale Rd., Tooting. [5681]

INDIANS all 1916 models, ex-stock, with and without sidecars; exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5185]

INDIAN, 1914, 7-9h.p., 2 speeds, Brown speedometer, electric light, first-class condition; £50; will take good 2-stroke lightweight in part payment.—West End Garage, Whittlesea, Cambs. [5662]

INDIAN, 7h.p. racing model, exceptionally fast and sporty, hand clutch, spare sprockets, 4 gn. lamp set, spares, like new; must sell; £32; Birmingham district.—Box 461, c/o The Motor Cycle. [X0363]

BLUE Indian, 1912, 7h.p., clutch model, and sidecar, perfect condition, spare tyre, accessories; £32, or separate; exchange any 1914; seen 7-8 evening, except Saturday.—Emily, 8, Golder's Green Parade, Golder's Green, N.W. [5797]

INDIAN, 1915½, 7-9h.p., 3 speeds, kick starter, electric equipment, with charging board, Gloria Projectile sidecar, dissolved acetylene set for sidecar, very fast combination, in splendid condition; bargain, £75.—Apply, Lingard, 10, Marsden St., Manchester. [5636]

INDIAN Latest 1916 Powerplus Combination with Godfrey's special sidecar, with hood and screen, many extras, cost £120, only done 900 miles, and as new, electrically equipped, £100, a bargain.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5187]

INDIANS in Stock.—Latest models, Power Plus combinations, sporting Power Plus 3 speeds models, standard 7h.p. overhead 2½h.p. combinations, with lighting set, the famous 5½h.p. 3-speed double-purpose mount and 7-9h.p. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [X0404]

1915 Indian, bought new February, 1916, 7h.p., spring frame, 3-speed, kick starter, electrically equipped, speedometer, T.T. bars, with Mills-Fulford sporting sidecar to match, only done few miles, otherwise brand new, smart, sporting outfit; cost £98, take £70; must sell.—29, Brigstock Rd., Thornton Heath. [5579]

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BLUE DUNGAREE  
COMBINATION  
ENGINEERS' OVERALL  
SUIT, 6/9 and 8/6.

BLUE DUNGAREE ENGINEERS'  
JACKET, 5/-.

BLUE DUNGAREE ENGINEERS'  
TROUSERS, 4/9.

BLUE DUNGAREE BIB AND  
TROUSERS, 5/9.

The LANCER  
MOTOR CYCLISTS'  
SUIT.

Thoroughly Water-proof Coat, double-breasted, with storm cuffs and waist belt of same material, two large X pockets at sides, deep collar, extra sewing at all points. Made from untearable twill only. Colour, olive brown. Overalls are seamless trouser fronts spring fasteners at sides, inverted pleats to allow ease in putting on. A first-class medium weight suit.

45/-

Chest and inside leg measure only required.

## OILSKINS FOR MOTOR CYCLISTS.

In brown or green shades. Thoroughly seasoned. D.B. coat, 36in. long, velvet collar, tab at throat, half-lined oilskin. Overall leggings, spat fronts, spring fitting at sides. 21/-

Chest and inside leg measures only required.

## WASHING SUITS.

To duck material. Very strong. Unlined, tab at collar, double-breasted, buttoning close to neck. Strap cuffs. Overall leggings buttoning at sides. PRICE 10/6.

LADIES'  
OILSKIN  
COATS.  
(Unlined.)

In green, tan, or black, fly front, velvet collar, two X pockets, tab to collar, wind cuffs.

PRICE 25/-

## "ASBESTOL" GLOVES.

In tan or black, Fleece-lined—

PRICES.

7/3, 9/3, 10/3, 12/9

Unlined—

7/9, 9/-, 11/6

## HORSE-HIDE ROUGH BROWN LINED GAUNTLET CUFFS.

Very useful for dirty work..... 4/6

BLACK OR TAN SHEEPSKIN SHORT GAUNTLET CUFFS.

4/6 and 5/3

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## MOTOR CYCLES FOR SALE.

## Indian.

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## Invicta.

INVICTA, must sell, under orders for abroad, sporty, fast, not more than 250 miles, new January, 1916, Dunlops, not worn, Thompson-Bennett mag., guaranteed perfect; £28.—Davy, Royal Oak, Biggleswade. [X0373]

## Ivy.

IVY De Luxe, 1916, 2-stroke, T.T. bars, only used for a few miles; £27/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0552]

## James.

1915 James Combination, all spares, seen by appointment.—21, Crews Rd., Child's Hill, N. [5796]

JAMES No. 6 Combinations in stock; no waiting.—Colmore Depot, 261, Deansgate, Manchester. [4666]

COLMORE Depot, 261, Deansgate, Manchester, have in stock complete range of James motor cycles. [0803]

1914 James Combination, lamps, horn, excellent condition; £45.—Pearson, 3, Baker St., Potters Bar. [X0254]

1913 James, 4½ h.p., free engine, adjustable pulley, excellent order; £30.—93, Summerfield Crescent, Rotton Park, Birmingham. [5587]

JAMES 1916 3½ h.p. Touring Model, 3 speeds and hand clutch, Splittorf mag.; £59.—Maudes' Motor Mart, 136, Gt. Portland St., London, W. [5541]

JAMES, 4½ h.p., 3 speeds, kick-starter, brand new, shop-soiled only; list £66/5, accept 60 gns.—P. J. Evans, John Bright St., Birmingham. [X0405]

JAMES, 4½ h.p., 1914, 3-speed, kick starter, coach-built sidecar, speedometer, in perfect order; 40 gns.—Percy and Co., 337, Euston Rd., London. [5827]

THE Ideal Sidecar Combination, fully guaranteed, practically brand new James combination, used 3 months only; cost over £90, accept £57/10.—Webb, Jeweller, Chesterfield. [X0421]

## J.E.S.

J.E.S., perfect order, spare belt, 150 m.p.g.; £12.—R. J. Hayes, Royston, Mon. [X0222]

1½ h.p. J.E.S., new machine, vertical engine, mag. ignition, includes pedals, tree engine, and spare belt; 19 gns.—Wanchopes', 9, Shoe Lane, London. [X0312]

## J.H.

IMMEDIATE Delivery of J.H. motor cycles; exchanges.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [5625]

J.H.—All 1916 models ex-actual stock; exchanges arranged, best allowance prices quoted.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. 'Phone: 552 Mayfair. [5888]

J.H.—Brand new late 1915 combination, 6 h.p., M.A.G. engine, 3-speed gear and chain drive, complete with Canoelet sidecar with hood and screen; list price £99; fully guaranteed and offered at £82/10.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5191]

## Kerry.

3 h.p. Kerry Motor Cycle, good running order, U.H. mag., Dunlops, B. and B. enamel and tyres in good condition; bargain, £15.—Ward, Hampden, Missenden. [5836]

## Lea-Francis.

LEA-FRANCIS, 3½ h.p. twin, 1914, T.T. bars, Watford; £35.—Write for view, 1, Campbell Rd., Croydon. [0812]

## Levis.

LEVIS, new 1916 Popular model, ready for riding away.—Moss, Wem. [X0392]

LEVIS Popular, 1916, 2½ h.p., just delivered; £30, or near.—F., 145, Cheapside. [X0226]

1915 Popular Levis, as new; £24.—Thursby, 53, Grand Parade, Harnagey, London. [5859]

LEVIS, 2½ h.p., brand new; accept £24, a bargain.—157, Hatfield Rd., Wimbledon. [5727]

LEVIS, shop-soiled only, fully guaranteed; £32.—Colmore Depot, Colmore Row, Birmingham. [X0211]

LEVIS, 2-speed, chain drive, in stock; £47/10.—Marston, 26 and 31, Bridge St., Chester. [X0294]

BABY Levis, shop-soiled only, but fully guaranteed; £22.—Colmore Depot, Colmore Row, Birmingham. [X0208]

LEVIS, 2½ h.p., overhauled by makers; £23; including accessories.—Colmore Depot, Colmore Row, Birmingham. [X0202]

COLMORE Depots, Birmingham and Leicester, for delivery of all models of Levis motor cycles from stock. [0804]

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LEVIS, 2½ h.p., 1913, countershaft, single speed, splendid condition; trial; £12/10 cash.—G.A., 13, Park Terrace, Swindon. [X0337]

LEVIS, guaranteed perfect, fast, not done 500 miles, covers not worn, new December, 1915; £22.—9, Market Sq., Biggleswade. [X0374]



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8	1915 Harley-Davidson and Sidecar	£60 0
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6	1915 Calthorpe-Jap, 2-speed, reduced	£32 0
3	1915 Enfield, 2-sp., T.T.	£35 0
2½	1912 Douglas, 2-speed	£20 0
5	1915 Indian, 3-speed, used 50 miles	£58 10
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## MOTOR CYCLES FOR SALE.

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LEVISES.—All models from stock; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5669]

2½ h.p. Levis 1916 model, only once used, fully equipped with accessories; £32; guaranteed.—Wanchopes', 9, Shoe Lane, London. [X0320]

LEVIS Popular Model, new, but slightly shop-soiled; a special bargain, £24/17/6.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [5643]

LEVIS, 1915, 2½ h.p., mileage 1,000, carefully used, and in beautiful condition; £24;—seen after 8 p.m.—Penson, 36, Highbury New Park. [5858]

LEVIS, 1916. Popular models.—We are sole Oxfordshire agents, and can deliver correctly tuned Popular models at once.—Layton's Garage, Bicester, Oxon. [X0492]

LEVIS Popular, latest 1916 models, ex-actual stock; exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5887]

LEVIS Popular, 1915, excellent condition, new Dunlop tyres, P. and H. lamps, and all accessories; trial by appointment; £22.—Hudson, 22, George St., Richmond, Surrey. [5837]

LEVIS 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents. Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. 'Phone: 1432 Regent. [0711]

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MARTIN J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear, £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [0760]

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6 h.p. 1912 Matchless-Jap, 2-speed, sidecar; £35.—Langton, 19, London Rd., Ipswich. [5756]

MATCHLESS, 8 h.p., 2-speed, and coachbuilt sidecar, new condition; £35.—Marston, 26 and 31, Bridge St., Chester. [X0306]

MATCHLESS, 1913, 8 h.p., Canoelet sidecar, hood, screen, Pillion, complete accessories, excellent condition; £55, cost £110.—Tubby, Outlook, Park Hill, Loughston. [5790]

MATCHLESS (Oct., 1913), 6 h.p., 2-speed, clutch, Canoelet sidecar, lamps, Cowey speedometer, etc.; not been much used; £48.—Kendall, 5, Wood St., Stratford-on-Avon. [X0396]

1912 Matchless-Jap, 6 h.p., 2-speed, wicker sidecar, and screen, P. and H. lamp, all tyres and belt nearly new, all in excellent condition; £45.—After 6 p.m., 2, Buckingham Mews, Buckingham Gate. [5778]

1913 Matchless, 6 h.p. J.A.P., 2-speed, clutch, kick start, tradesman's delivery body, also luxurious cane sidecar, absolutely perfect; £35 for immediate cash.—3, The Mews, Victoria Rd., Northside, Clapham Common. [5659]

MATCHLESS, 1914, 8 h.p. M.A.G. engine, 3 speeds, fitted with Collier's special sidecar and Lucas dynamo lighting outfit with 3 lamps, Watford speedometer, excellent order; £82.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5884]

MATCHLESS Late 1914 8B Combination, clutch, chain drive, perfect order throughout, 2 Palmer Cord tyres, 1 Avon, complete lighting set, speedometer, 2 horns, wind screen, everything perfect; £70, or near offer; seen any time; trial run by appointment.—97, Camden Mews, Camden Sq., N.W. [5801]

8 h.p. Matchless Model B. 1915 Model Combination, machine and sidecar complete, with speedometer, and all accessories, folding carrier, beautifully upholstered sidecar, elaborate finish, 3-speed countershaft gear, free engine, and chain drive; £87/10; guaranteed.—Wanchopes', 9, Shoe Lane, London. [X0331]

1914 Matchless, with Swan sidecar, M.A.B. engine, 3-speed gear box, clutch, kick starter, P. and H. head lamp, horn, speedometer, tail lamp, etc., lot in splendid order; 68 gns.; exchange entertained with 1914 or later Triumph or Douglas.—Cambridge Garage, Francis St., Woolwich. 'Phone: 108 Woolwich. [5866]

1915 Matchless Combination, M.A.G. engine, 3-speed gear box, clutch, kick starter, Lucas head lamp, electric sidecar lamp, tail lamp, horn, speedometer, just thoroughly overhauled, looks and runs like new; £75; exchange entertained with 1914 or later Triumph or Douglas.—Cambridge Garage, Francis St., Woolwich. 'Phone: 108 Woolwich. [5866]

## Minerva.

MINERVA-LUGTON, 2½ h.p., mag., good tyres, all accessories; £14.—Scraser, 234, Battersea Park Rd., S.W. [5783]

MINERVA, 3½ h.p., and sidecar, B.S.A. frame, B. and B., and 11a. Whittle belt, good condition; £12.—69, Belgrave Rd., Walthamstow, E. [5703]

MINERVA, 3½ h.p., Bosch mag., in splendid condition throughout, including enamel and plate; £13/13.—Egbert Spearman, Bishop's Stortford. [5606]

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## Petrol Waste.

**A**LL our readers must be familiar with the poster, "Don't use your motor for pleasure," and with others of the same class, the object, of course, being to curtail the use, and consequently the importation, of petrol. There are, however, better ways of achieving this object, and we hope that the Petrol Committee will evolve a plan that is at once effective and fair. Private motorists are well aware that the needs of the nation must claim priority, and they are quite content to subordinate their needs to the general good. As a correspondent points out, the proposed motor taxes tend to increase the use of individual motors (while they will certainly decrease the number on the road), because a man, having paid an exorbitant tax, will naturally wish to use his machine as much as possible in order to justify his expenditure in taxation, which is the same for a yearly distance of 1,000 miles as for an aggregate of twenty times that amount. It seems to us that an increased tax on petrol would be a far better method of attaining the end in view, viz., the economy of motor spirit. A man, who previously has been just able to afford a weekly run of 100 miles or so, would then not be obliged to lay up his machine, with a loss of healthy recreation to himself and revenue to the country, but would simply have to reduce his mileage, and instead of spending all day awheel could run out to a convenient spot and spend the day in the open air exploring the woods and commons and regaling himself with an *al fresco* lunch by the roadside. Thus his consumption of petrol would be reduced, but this would entail no real hardship. Apparently motor chars-à-bancs are not docked of their petrol supplies in any way, even when employed simply on pleasure jaunts; why then should others be interfered with who spend no more upon their week-end outing but prefer to spend their money in a different way?

While on the subject of petrol economy there is one other matter which seems to clamour for

an explanation. Every week large numbers of Government lorries are constructed in the Midlands and Lancashire: these are run up to London *empty*, using petrol at the rate of about six miles per gallon; and all the time the railways are congested with goods for the same destination, though possibly for a different Government department. Why should not some arrangement be made by which these lorries could run *loaded*, and thus do useful work from the very commencement of their career? Then again, there are more routes than one from Lancashire to London, and it seems to us a mistake to send all the lorries by the same route and damage the road surface beyond hope. Motor 'buses, too, consume large quantities of petrol, and while we admit that in many cases they serve a useful and necessary purpose, in others they certainly do not. Last Sunday some 300 motor 'buses visited the village of Chigwell, and it is stated that the scenes in the public houses just outside the London area on Sunday morning were most unseemly. Nearly 2,000 gallons of petrol must have been used on these trips, while the damage to the roads (to which the motor 'buses contribute nothing) is so great that the Epping Rural District Council has decided to send a deputation to the Local Government Board with the object of urging that the use of motor 'buses on the country roads, especially on Sundays, should be restricted. A simple calculation shows that this amount of petrol would have sufficed to carry ten despatch riders, travelling, say, ninety miles to the gallon, nearly fifty miles a day each for an entire year. Last week's *Punch* supplies us with an appropriate quotation:

"Well, I have read about some other grumblers

With curious similarity of soul,

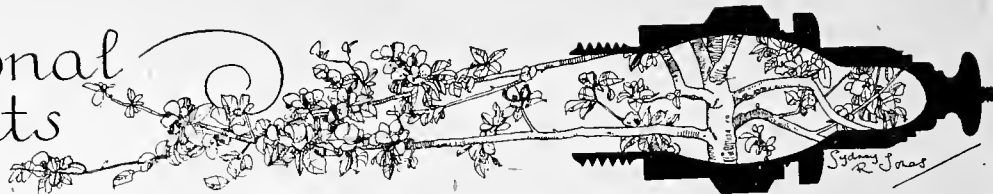
Who left untouched the gnats that thronged their tumblers,

But drank their camels whole."

We commend these lines to the National Organising Committee for War Savings.



# Occasional Comments by "Ixion"



## A Simple Starting Wrinkle.

If any readers have machines which start without injection, but are a trifle stiff at the first push, the following tip may interest them. A machine is easiest to push with a high gear engaged, but easiest to mount on a low gear. Therefore break the oil films by pushing it out of garage on a high gear; and then paddle it off, seated astraddle, on a low gear—second rather than bottom. This is the quickest and least laborious method of starting most multi-speed machines.

## Some Back Springing Details.

Of course, we are still a gigantic distance from standardisation of rear-springing; indeed, a few makers of the stick-in-the-mud order have not even got far enough to start thinking about it. But I want to make a present of two scraps of information to these conscientious objectors, when at last they join up. When you at last follow the crowd and adopt rear-springing, you may either plate your springs, or enamel them. Plating looks very nice when it is new, but if you want to find buyers for a big output, don't copy the blunder some designers have perpetrated, and add any more unnecessary plating to the standard machine; goodness knows, it carries more than enough of it already. Secondly, when you put your brains merchant on to the job of designing your rear springs, he will probably make some learned remarks about the cantilever system, which—as you will, of course, be aware—is an inverted semi-elliptic. A simple sum in arithmetic will remind you that a semi-elliptic is twice as big, heavy, and costly as a quarter-elliptic. You may be large-hearted enough to damn the expense, but may I timidly inform you that a quarter-elliptic, properly designed and made, will give your customers every bit as much comfort as the cantilever? That its adoption will save you a few shillings per machine, and, what is even more important, will reduce the number of working joints to be greased daily by your careless clients from six to two? Nuf sed, I hope.

## And then the Front Forks.

Common honesty compels me to add that when you adopt rear springing you will simultaneously want a new front fork, unless you are one of the clever or lucky few. In the past nobody thought of complaining if the front fork clashed a bit over bad bumps, or jangled its brake gear against the front down stem; in fact, we were largely ignorant of these happenings, because the jangle of the front brake was drowned by the medley of noises from a tinkle to a clatter, emanating from the contents of the rear panniers; and the rather frequent and violent clashes of the front fork represented the very poetry of motion when contrasted with the buck jumps of the tail of the machine. But when you get your rear springing dead right, you won't know your carrier is moving in the vertical plane, unless you watch its shadow out of the tail of your

eye; and you won't hear a sound from it, even if you strap a biscuit box containing a dumb-bell on it. So you will tardily awaken to the appalling crudity of your front fork (unless, as I say, you happen to be one of the few makers who have already evolved excellent front forks). Your fascinated gaze will be glued to its springs, and you will see them open and shut like the breach of a French 75 mm. gun doing a *rafale*, but with more violence and velocity; your outraged ear will hear nothing but the rattle of the front brake rod against the steering head, and the metallic protest of all the twiddly bits composing the front fork; as it opens and closes ten times a second with a pressure of about 3 ton per square inch. Then you'll summon the brains merchant of your factory, and say, "While you're about it, think out a new front fork, too; silent, mind you! And don't let it clash!" So you may just as well specify new front springing when you pass the word for the back springs.

## One Danger of Perfect Springing.

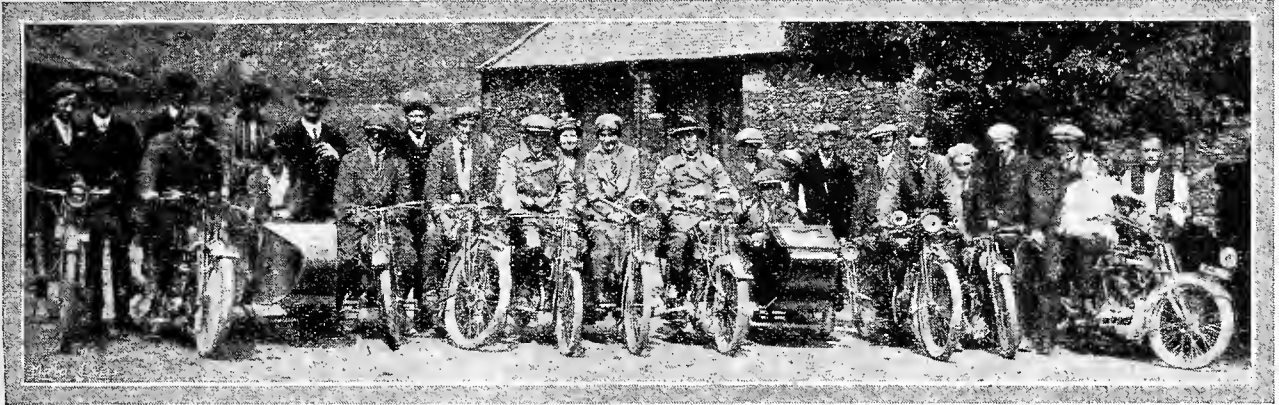
Every veteran rider knows the awkward swerve produced when either wheel strikes the steep edge of a smoothly hollowed rut at a very acute angle. It is not as bad as getting in register with a greasy tramline, but it is a fair imitation of that nightmare. Down goes the wheel to the bottom of the rut, and the other end of the machine is jerked sideways to suit. There is no danger about the matter for a rider who is alert and has his machine under control, but it may prove awkward if you happen to be putting on a glove or looking at your watch. Well, with rigid framed machines one is always warned that this possibility is about. A road which boasts this particular sort of rut makes its presence and character acutely felt up the vertebræ. But when you get on a perfectly sprung machine you don't know that the road is of this treacherous order unless you are keeping a keen look out; you are under no necessity to keep your track to an imaginary line along the centre of the camber, for it is long odds against your feeling the bumps if either wheel drops into them; the fore and aft springs can be trusted to rule the lot out. But there is an exception, as above stated. For example, if you are riding on the camber, and steering one-handed with a bit of a wobble, your front wheel may leave the camber and impinge on the steep side of the broad rut at an angle of about 1°. The machine won't give quite such a hop as a rigid frame would, but, as we all know, such ruts are often very deep, and you can hardly expect a spring fork not to protest faintly. As even spring-framed machines have not got a lateral hinge amidships, the steering is bound to be thrown out. Therefore, special care is advisable when riding spring frames on really bad roads until you are accustomed to them; the physical sensations do not give sufficient warning of the steering conditions to induce the necessary care and attention.

# WITH THE MUNITION WORKERS HILL-HUNTING IN LAKELAND.

Some Adventurous Climbs and a Remarkable New Hill.

By GEORGE D. ABRAHAM.

Author of "Motor Ways in Lakeland," "The Complete Mountaineer," "Mountain Adventures at Home and Abroad," etc.



A group of munition workers near the foot of the Stoneythwaite Rake. The group includes the successful riders in the hill-climbing expedition described in the following article.

**I**DEAL springtime weather and spring-time spirits marked the first munition workers' holiday on the Lakeland heights. If ever there was an occasion when pleasure motoring was justified in these warring times, surely this was one of them. Jaded workers from the whirring machine-shops of West Cumberland—where, especially in the aircraft section, work proceeds at fever heat night and day—came forth into the pure air and pure delight of trying their motor cycle mounts against the mountains.

The Vale of Duddon, truly the home of record hills, was the appointed scene of operations, and the little grey village of Seathwaite was the meeting-place. Surely the quiet dale has never seen such stir. Duddondale is notorious for its complicated roads, and from everywhere came the bark and roar of busy engines as we made our way towards Seathwaite. It was obviously to be a record gathering of its kind, and there were thrilling moments on the way. One was all eyes and ears at every meeting of the byways, for lost riders were hurrying to make up lost time. Some never arrived until evening when all was over.

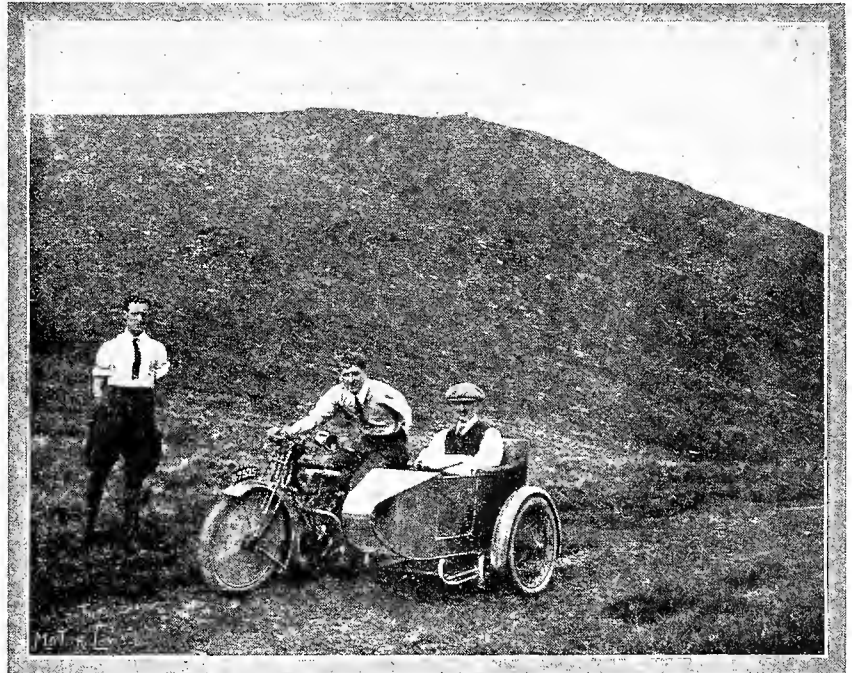
The writer had come over from Kendal on a lusty A.J.S. sidecar outfit driven by Harry Whinnerah, a celebrated hill-hunting character in these northern dales. George Braithwaite, the expert competition rider of the peaceful, palmy days of trials galore, gave us the doubtful benefit of his dust. We followed his trail over Underbarrow, Gummershow, and Gawthorp Moor, and through Broughton-in-Furness to the sharp, right-hand turn up Duddondale at Duddon Bridge.

## Promise and Performance.

A great programme had been planned for the enthusiasts of the party, who

numbered over a score of "single-trackers" and nearly a dozen sidecars, but eventually it proved that only one sidecar driver had serious designs of joining in the sport. The plan was to climb the notoriously difficult Stoneythwaite Rake and make a circuit over the mountains back to Seathwaite by Birks Farm Hill. Then Walna Scar was to be attempted after lunch, and

Wrynose Pass crossed to Little Langdale as a grand finale. In the end, the Rake and Walna Scar, without the circuit, proved quite sufficient for a full day's sport, and one of the best withal. The large number of riders and their persistence of attack or determination not to admit defeat made the programme very long, but it was an altogether entertaining one for the spectators.



The A.J.S. sidecar driven by Harry Whinnerah, a one-armed expert, at the top of Walna Scar, 2,100 feet above sea level. This is the highest point in Lakeland reached by a sidecar.

### With the Munition Workers in Lakeland.—

At the outset the way to the Rake lay in a short return down the valley to the curious narrow Donnerdale Bridge over the Duddon. There we swung sharply round to the right, and were thankful that the crowd in front had left the many gates open. Those aloft had crossed the fields from Seathwaite. They especially are not likely to forget the wonderful sight up Wallabarrow Gorge on the way.

A carpet of bluebells led through the sweet-scented shades to the quaint stepping stones across the surging river, of which Wordsworth wrote so beautifully. Motorists who are passing over the main road at Seathwaite and are anxious to see the Rake at close quarters would be well advised to take this pleasant ten minutes' walk.

But with the munition men victimised by the hill-hunting fever, the Rake itself occupied all attention. There was much excitement as we approached the foot of the climb, and everybody was gazing skywards almost in the correct Zeppelin attitude. The attraction was soon obvious. Far above us the grey line of roadway curled out of the larchy underslope up to a gap in the skyline between huge purple precipices and a pale khaki-coloured speck of life was moving slowly aloft threading the perilous zigzag heights with a tiny white wisp of cloudlike smoke following its passage. It was George Braithwaite on his small Royal Ruby machine, the first man up the hill, and, as later events proved, the man to make the best and easiest ascent. The success of this small 2½ h.p. two-speed machine was the outstanding feature of the whole outing.

Doubtless, the skilful touch of an "old hand" was concerned in this, but on such steep, slippery, curly, and sliding slopes as the Rake the light machines seemed to make the best show. At the other extreme, a heavy 7 h.p. Indian, driven by J. G. Bethwaite, provided the excitement of the day, but of this more later.

### The Worst Hill in Lakeland.

This machine was the next to follow the Royal Ruby, but the initial terrific onslaught ended in "smoke" and then

silence. On our way up to the vantage point of the half-way bend for the purposes of photography, we passed the rider descending. The ascent on foot was extremely trying, for a breathless, thundery, warmth hung over the valleys and troubled the human engine as much as that of the petrol variety. Yet there was fair opportunity to corroborate a former opinion that, as a real road problem, the Rake must rank as the

Several of the ascents were thrilling for the spectators. Of the aircraft workers from the West, Stanley Bewsher made an exceptionally fine climb on his big, single-gear 8 h.p. Bat. Gilbert Brown restrained his 7 h.p. Indian splendidly, and his was the only foreign machine to reach the top. The pluck of J. G. Bethwaite on another 7 h.p. Indian was most astonishing; probably he frightened everybody except himself.

Time after time those up aloft heard the heavy roar of the engine, and finally the hero of many a despatch-riding adventure appeared round the bend close below. The powerful Indian was bucking and plunging like a wild cart-horse held in a leash. For an instant the rider forced it in the straight upward way. But the approach to the "hairpin" was refused. After a fearsome swerve, suddenly, and amidst a noisy, dusty uproar, machine and rider dashed off the road into mid-air. There was a startled cry from the spectators, a lucky click by the camera man, and everybody pressed to the rescue. The rider and machine had fallen seven or eight feet on to a soft bed of old bracken, which might almost have been placed there for their special reception. Yet it was a lucky escape. Three or four inches further and the rider's head would have struck the wall, and we should have rescued a less voluble being from under the heavy Indian. As it was, only a few bruises and some twisted details of the machine required attention.

### The only Sidecar Attempt.

Then J. Wilson, a Barrow rider, on a 3½ h.p. Rover, made a daring, if erratic, ascent. He certainly made every spectator

stand at a respectful distance from the margin of the road. Other enthusiasts almost reached the summit, notably a rider on a Rudge-Multi and another on a Rex-Jap, whilst Harry Whinnerah, on his A.J.S. sidecar, failed only with the goal in sight. The gear was obviously unsuitable. The drivers of other combination outfits evidently now deemed the climb hopeless; they made no attempt. The numerous spectators had some warm work assisting in the descent of the heavier machines, and some curious



A LUCKY SNAPSHOT ON THE RAKE.

The Indian jibs at the middle "hairpin" on a gradient of 1 in 3. The rider, J. G. Bethwaite, and the machine fell into the ditch!

worst hill in Lakeland. The "best" hill seemed the proper way of expressing it in these times, and one could not avoid thinking of a few years ago when hills of comparative simplicity were anathema. But now hill-hunting has become quite an obsession with sporting riders, and the best hill is one which cannot be climbed twice in succession without collapse. Such is the Stoneythwaite Rake, with its six difficult corners and stone-strewn gradients, where 1 in 3½ is the prevailing incline.



**With the Munition Workers in Lakeland.**— devices were employed. For instance, the careful tyro who, to act as a drag-brake, tied a big piece of the mountain to his spare belt would have found a borrowed rope less extravagant in these days of War Savings Committee warnings.

#### Climbing Walna Scar.

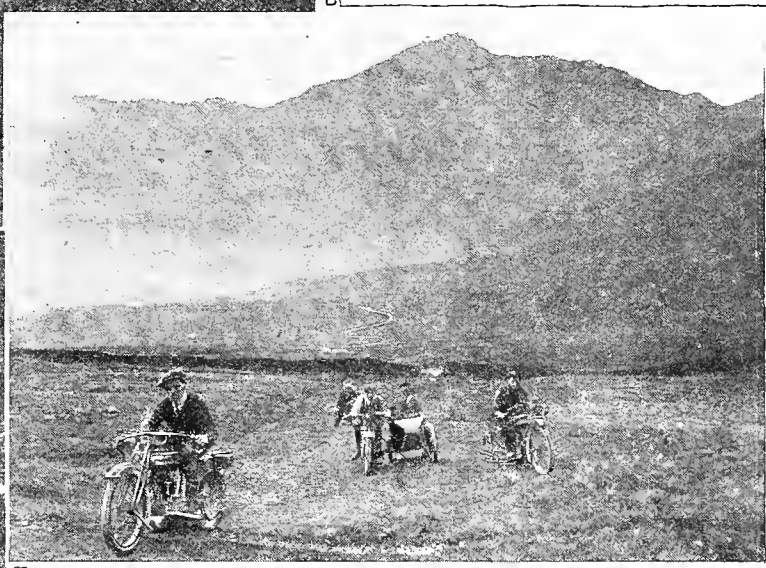
After refreshment at the New Field Inn—which, under its new management and with its fascinating surroundings, motor wanderers would do well to remember—an attack was made on Walna Scar. A year ago Stanley Bewsher had piloted his 8 h.p. Bat to the summit, and he

seemed anxious that others should now enjoy the experience. Few volunteered, but those who succeeded were more than satisfied. The main features of the Walna Scar Pass, which leads over the mountain from Duddon Valley to Conistoun, were its length, continuous steepness, and lack of spectacular situations. Thus the lookers-on found the climb dull after the excitement of the Rake, and very few walked even half-way up. Still it was a fine sight to watch the plucky riders dash up the lower rocky bends, then for a time disappear, to emerge again high up on the great mountain wall more than a thousand feet overhead. J. G. Bethwaite, on the big Indian,

again was first man away, and but for halts to open the gates he might easily have made a non-stop climb. Unfortunately, he had trouble in restarting on the steep and slippery slopes, and George Braithwaite on his irrepressible Royal Ruby passed by. He was first to taste the fresh cool breezes on the crest of the Scar, whilst those below were "hot beyond words." His was the only non-stop run; all the others who succeeded had to be "dug out" of a slate refuse heap, which seemed to have wandered on the steep road about half-way up the climb. This obstacle became worse after numerous riders had plunged into it, scattering fragments broadcast over the mountain side and spectators as well. There was general acclamation when J. G. Bethwaite rushed the lower bends on his racing Indian, and still more satisfaction when word came from the heights that he had reached the summit, despite another quarrel with the available width of the road. The springing of the Indian added to the unsuitability of the big machine for the work in hand, and Bethwaite would assuredly have had a less boisterous time had he brought his despatch rider's mount instead.

#### A Fine Performance.

Amongst others to reach the top were Don Dyson on a 6 h.p. Rex-Jap with



(Top) Climbing Walna Scar above Duddondale, a remarkable new hill first climbed by the munition workers. The road is grassy and steep, and ascends for two miles to over two thousand feet above the sea.

(Centre) A group of machines climbing the grassy road up Walna Scar.

(Left) The A.J.S. sidecar climbing the Rake on a gradient of 1 in 3.

three speeds, Gilbert Brown on a big two-speed Indian, and J. Wilson on a 3½ h.p. Rover. The successful ascent by Harry Whinnerah on the 6 h.p. A.J.S. standard sidecar machine was a meritorious performance, and one that is likely to rank as a record for a considerable time. It needs some familiarity with precipices close at hand, or at wheel, to drive a two-tracked machine for half a mile with one tyre two or three inches from the edge of nothing. This refers to the upper part of the Walna Scar road, which was in reality only a narrow, upward slanting slit cut across the mountain. But the danger was more apparent than real on a day following many others of continual dry-



With the Munition Workers in Lakeland.—ness. Under damp conditions the climb would be impossible.

Such were the writer's impressions as he clung to any available hold on the A.J.S. behind the plucky driver who, despite the physical loss, can do more, with one arm than most men with two. Our worst trouble was in "Slate Tip Gulley," as someone named the half-way obstacle. Our mighty dash into the sliding mass flung the machine and its load broadside off the track into a grassy hummock, where part of the frame became embedded. Another attempt at

slower speed and kind help from some "hefty" munitioners landed us on to the grassy slopes which finally led to victory. This climb to a height of 2,100 feet above sea-level will rank as the highest point yet reached by a sidecar in the Lake District.

#### Homeward Bound.

There was just time ere the descent was begun to note the wonderful view of Scawfell and the loftiest of our English mountains, which were gradually being blotted out by an oncoming thunderstorm. Had it arrived an hour

sooner the descent would have been a desperate undertaking, but the rain did not start until the valley was safely reached and the homeward journey begun. Thus ended the most successful gathering of its kind in the Lake District. It will certainly not be the last, and on a future occasion it is hoped to invite a party of despatch riders to join in the attack on some other famous hills. It is the very training they require, and the man who can pilot his machine over such heights as Walna Scar need fear no roads in France or on the rugged heights of Serbia.

## MILITARY NOTES.

News from the Punjab, France, Mesopotamia, and the North Sea.

#### MOTOR CYCLING IN THE PUNJAB.

A READER who is with his regiment at Sialkot, the Punjab, India, tells us that motor cycles are very numerous in that part of the world, especially Triumphs and Douglasses. Our correspondent rides an Indian, and he tells us that the roads thereabouts are excellent and he gets many fine rides at high speeds.

#### THE DESPATCH RIDER'S SALUTE.

THE following is an extract from "The Watch Dogs," the title of a letter from an officer at the Front, that is almost a weekly feature of *Punch*:

"Fortune favours the brave, and the lightning despatch rider, as often as not, will pass through the lot (lorries and cars) with the loss of little more than a couple of limbs and half-a-dozen spare parts. Even so, he will not omit to salute you, as you stand off the road—a sight which has a peculiar thrill of its own, since the salute of a motor cyclist consists in his looking fixedly in one direction and proceeding recklessly in another. You cannot help appreciating

his courtesy, but in your more nervous moments you can't help wishing he wouldn't do it."

#### MILITARY TWO-STROKES.

WE had a card a few days ago from Lt. F. L. Bassett, formerly of the Streatham and District M.C.C., and now with the Indian Expeditionary Force in Mesopotamia. The motor cycles out there are mainly Triumphs and Douglasses, but there are, Bassett tells us, some two-strokes. The roads are far worse than anything encountered in Scottish Six Days Trials, their condition immediately after rain being past description.

#### IN CHARGE OF A MOTOR PATROL BOAT.

WE had a call the other day from Lt. F. A. McNab, R.N.V.R., who is at present in command of a fast motor patrol boat somewhere in the North Sea. He had many interesting experiences to tell us, and saw a great deal more of the Lowestoft bombardment than he liked. The roads

round his dépôt are excellent, but he has had no opportunities lately for enjoying a ride on a motor bicycle. McNab confirms the reports concerning the popularity of *The Motor Cycle* among all stages of the Senior Service that we have heard from many parts of the world. Many fellow-officers in his mess are keen riders.

#### THE ACTIVE SERVICE PRESS.

RECENT references in these columns to papers published by soldiers for soldiers have resulted in two more being brought to our notice. These are *The Gasper*, "the unofficial organ of the 18th, 19th, 20th, and 21st (P.S.) Royal Fusiliers," and *The Sphinx*, the official organ of the 2nd/6th Batt. Manchester Regiment. Both have the advantage over some other war papers in that they are printed in England. A few are actually printed in the war zone, and this fact naturally adds to their interest.

*The Gasper* is edited in France by Pte. G. M. Green, who in peace days is a keen motor cyclist. *The Sphinx* is the best active service paper we have seen so far. There are twenty-four pages of matter to meet all tastes, and several good illustrations.

#### IMPROVING THE BREED.

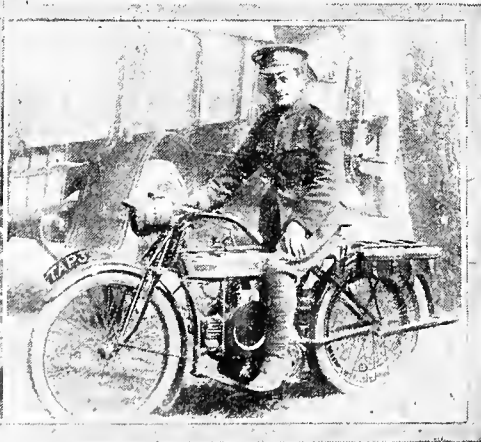
DESPATCH riders' mounts in Macedonia are being severely tested by reason of the entire lack of good roads prevailing in that part of Europe. An R.E. sergeant, writing from Salonika, says that they have had thirteen frames, seven front forks, sixty fork springs, and many saddle springs broken already. These besides smaller items such as carriers and mudguards.

#### SIDECARS ON THE RIGHT.

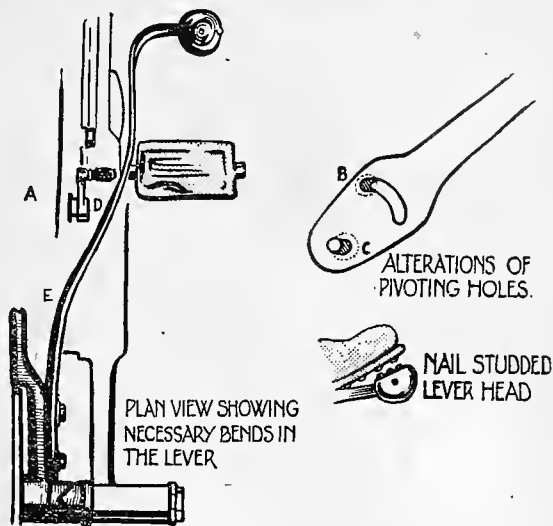
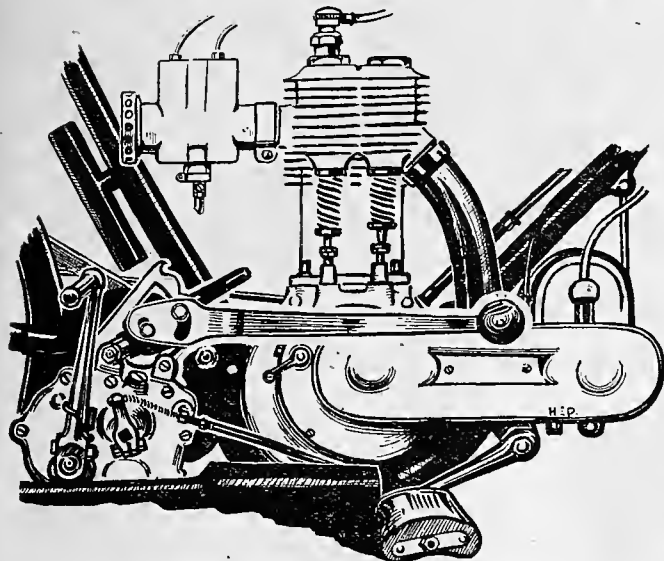
A MATTER to which we have referred on more than one occasion is the fact that sidecar outfits intended for use in France are still sent out with the sidecars on the left. This is all very well for England, but over there, where the rule of the road is the opposite to that in England, it is altogether wrong. Cpl. H. A. Beard, in a recent letter, emphasises this point, stating that with the steep cambers prevailing on many roads in the war zone it is very dangerous at times. Why take so long to appreciate such a simple fact?

#### PEACEFUL MOMENTS BEHIND THE FIRING LINE.

The photographs were sent by Pte. E. Marsland, A.S.C., M.T., Staff Section. Marsland, who has been in France for over twelve months, was an observer in the 1914 A.C.U. Six Days' Trial.



## Foot Control of a Countershaft Gear.



Sturmev-Archer countershaft gear on a Triumph, altered so that the change of gear may be effected by foot instead of by hand.

**R**IDERS, and particularly British despatch riders on service, will be interested in the following suggestion for converting to foot control the usually hand-operated Sturmev-Archer countershaft gear lever fitted to the more recent models of the Triumph, as the need for retaining a firm hold of the handle-bars with both hands, when riding on the war-worn roads of France and other districts of military occupation, is of paramount importance.

Referring to the sketches, it will be seen that the operating lever is bent at two places, viz., at right

angles near the wooden grip knob and outwards at E, to clear the decompressor lever D. A flat face is cut on the wooden knob and studded with nails to prevent undue wear. The holes B and C, on which the lever is pivoted, are enlarged.

This idea is more particularly interesting as it comes to us from a French reader—a Quartermaster in a regiment of artillery on active service in the French firing line—and there is additional interest in the admirable illustrating sketches, made with the poor materials at hand, under war conditions.

## A COMEDY OF ERRORS.

Some Illusive Formula Figures Corrected.

**A** FORTNIGHT ago we stated that the only published figures (formula) of the hill-climb for public schoolboys contained two gross errors, perhaps more. Our contemporary retorted that the accuracy of these figures need not be doubted, and insinuated that, as we were not in possession of the details, criticism on our part was ridiculous. Now it is often possible to say that a statement is wrong, although, in the absence of necessary details, one might be unable to say what was correct. However, lest any of our readers might suppose that we have been indulging in wild guessing, let us examine the published results. The first thing that one notices is that the most powerful machines which made the slowest times have the best figures. Further, although we have not all the details, we have sufficient for our purpose.

In the case of Class VI. B, the Harley-Davidson has a capacity of 989, the time was 79 seconds, and the figure of merit ("the accuracy of which need not be doubted") is given as .1155. Thus  $\frac{C \times T^2}{W} = .1155$ , and

$$W = \frac{C \times T^2}{.1155} = \frac{989 \times 79^2}{.1155} = 53,440,000 \text{ lb.}!$$

Rather a

heavy machine and a remarkably hefty rider! (In fact, about the weight of a super-Dreadnought.) The second obvious error is in the same class, but if we turn to Class I. B we find the weight of the Baby

$$\text{Triumph and rider to be } \frac{C \times T^2}{.3545} = \frac{225 \times 65^2}{.3545} = 2.682,000$$

lb. This, again, is too high. In fact, every figure is wrong! If all the figures were incorrect in the same degree it would not matter, for they would still have served as a basis of comparison, but they are not. Apparently the weight has been multiplied in some cases by 10,000 and in others by 100,000—but why? There can be no adequate reason.

If the Baby Triumph and rider weigh 268 lb., the figure of merit should be 354. If the Harley-Davidson and rider weigh 534 lb., the figure should be 1155. The mistakes have arisen from an incorrect use of the decimal point, and are probably due to a paper attempting to deal with figures of a formula with which it is unfamiliar. Pioneers always have difficulties to contend with, and those who took part in getting out the formula results will doubtless have other things besides the drenching downpours to remember.



## A Further Selection of Letters from Readers scattered all over the World.

**O**UR endeavour to air the opinions of Overseas motor cyclists by publishing in the first issue of each month a selection of extracts from letters received from many Overseas readers bearing on the riding conditions, and so on, which exist abroad, has undoubtedly been much appreciated. We have already had quite a number of further communications expressing appreciation of the scheme.

Whereas in previous months our selections have been restricted chiefly to Australia and New Zealand, we are able this month to give extracts from India, Africa, and the West Indies, in addition to communications from the two previously mentioned countries. It is undoubtedly very difficult for manufacturers and riders over here to realise the difficulties under which motor cycling is carried on in these far-away parts of the earth. One of the greatest troubles is undoubtedly that of obtaining spare parts. This and the discontent caused by inflated Colonial prices for both machines and what spares are obtainable are certainly two sore points on which a very great number of our correspondents' letters bear.

After the war there will be undoubtedly great business to be done in the Dominions by the manufacturer who cares to study and remedy these two vital defects in his Overseas trading methods, in addition to studying the riding conditions in the countries where he is sending his machines and making them suitable for the conditions existing there, which in so many Overseas countries are totally different from those existing in England. Many makers are already alive to the position.

### Demand for Chain Drive.

Mr. W. J. GOUGH, Bowral, New South Wales: "The chain drive is in great demand here, and I think it is undoubtedly far better than the belt. My machine, which is a British-built 6 h.p. twin with chain drive, which I ride solo, is a most satisfactory one, but it is certainly a rather heavy mount for muddy or sandy roads. The chief trouble I have experienced has been due to broken control wires."

### English Machines Preferred.

Mr. W. SAUNDERS, Parramatta, New South Wales: "Australians, as a rule, prefer English goods, and we hope the war will soon be over and the English makers able to get down to 'biz' again, and make up for the time they have lost. A very large proportion of our motor cyclists, as well as very many prospective ones, are away at the Front, so when peace is declared the motor cycle business ought to boom out here."

### Motor Cycling Conditions in India.

"Phut-phut," Bombay, India: "The roads are, on the whole, good, but there are very few stretches where one can indulge in a real 'blind,' and nothing to touch the London-Birmingham or the Great North roads. I speak

of the Bombay side only, not being acquainted with the Calcutta, Madras, or Punjab districts. Dust is awful in the dry season, likewise mud in the rains. The Western Ghats provide us with some useful hills, but there is nothing worse than Kirkstone on the Thirlmere side, as they are all graded to 1 in 15, with very few exceptions, and present no difficulty except as regards many corners, their length, and the strings of bullock carts. The strings of carts, herds of cattle, and solitary carts (whose drivers are generally fast asleep) are the worst customers met with on the road.

"Practically all the machines are seen in the big stations, used by the civil and military alike, for running about the place. In big cantonments especially a motor bicycle is much handier and speedier than any other form of conveyance. There is no serious touring, and even among the owners of cars there is very little."

"Your motor cyclist out here is not the one you meet in England—not keen on it as a pastime, nor of the 'shamateur' type. He is almost always an amateur pure and simple, who must have some kind of conveyance."

"Up country, a man who knows anything at all about motoring soon collects a reputation, and in some cases I have known gets rather a thin time from his motoring friends."

"The price of British machines is not as outrageous as in New Zealand, but is, I think, in some cases higher than need be. Before the war a certain machine costing £50 in England was sold here for Rs. 950 (£63 6s. 8d.). I have made enquiries as to the cost of shipping one out here, and that particular machine would have absorbed £4 10s., and Customs duty would have been £2 10s., so I could have landed my motor bicycle for £57—a saving of about £6 on the agent's price."

"Second-hand motor bicycles always sell well, for there is the rich native, who is generally ready to plank down his money on the spot, and who does not care very much how much it is either."

### High-powered Machines Most Suitable.

Mr. J. O. JONES, Newcastle, New South Wales: "I consider that the higher-powered engines are the only ones that are really suitable for this country, even for solo work. A twelve or thirteen stone man should have for comfort at least 6 h.p. A good crank case ground clearance is necessary out here."

### Australian Assembled Machines.

Mr. F. BECKMAN, Grafton, New South Wales: "We out here are feeling the shortage of English machines, and, consequently, the Americans are making considerable headway with the sale of their machines in Australia. We now have several firms assembling their own machines, viz., Bennett and Barkell, Ltd., who fit J.A.P. engines; Healings, Ltd., Precision engines; and Bennett and Wood, who use M.A.G."

### Unpriced Machines and Spares.

Mr. H. E. TRAYLEN, Bombay, India: "Manufacturers should advertise their prices for all countries. Out here, if one asks for a price list of machines or spare parts it is supplied without prices. One is told when buying a machine that spare parts are obtainable. In 99% of cases parts cannot be had, except perhaps brake blocks. It is a known fact that the profit on foreign machines is greater than on British

## Overseas Opinions.—

machines. The foreigner is, therefore, rushed for all it is worth. One way of doing it is by putting the price of the British machine up. If only the manufacturer would insist that the retail prices are fixed he would gain a good return from one of the most excellent markets in the world (India). Although motor cycles are looked upon here as luxuries, the cost of upkeep is not really so very great. Petrol, for instance, is only one rupee (1s. 4d.) per gallon, recently raised 25%."

## Good Motoring Roads.

"G.H.," Hampstead, Jamaica, West Indies: "I have sold my old Indian motor cycle, and have ordered one of the latest three-speed Powerplus models. I am expecting it to arrive next week. Some of the roads hereabouts are simply ripping for motoring, and there are 'some' hills. Last year we went to a place called Mavis Bank. It is 4,500 feet up in the hills. In some places the road one has passed along can be seen winding three times below. It takes some nerve, as in several parts it is just a ledge cut in the face of the rock, with a sheer drop of 500 feet. The road is good, considering the fearful height. This year Jamaica has had a great number of American visitors. They could not get to Europe, so came here. Most of them brought motor cars, but there were a number of motor cycles and sidecars."

## Agents in India and the Ideal Machine.

"W.A.E.," Bombay, India: "Spare parts are very hard to get just now, and if they have to be ordered from England they may arrive in six months, or twelve months. I should like to bring one case to your notice, which, I think, is perfectly scandalous. After ordering some spares for his machine (of very well-known make and reliability) from an agent, a friend of mine thought the prices charged very high. Before the war there was an understood rule that one rupee was the equivalent of one shilling, and this particular agent also agreed to the understanding. My friend, therefore, asked the agent for his price list, and found in this price list (printed and supplied to the agent by the makers in England) that the article required cost £2 10s., which at the above rate is Rs. 50. Still not satisfied, my friend asked what price was shown in my price list, whereupon I found the cost was only £1 10s. My price list was posted to me from England. Firstly, there is no need for this extra 50% odd, for an equivalent rate of one rupee to the shilling gives an increase of 35%, which should afford ample margin for duty, freightage, depreciation, and unsold stock. Needless to say, spare parts were ordered direct from England thereafter. (This took place before the war.)"

"If only customers in New Zealand would be patient and order their machines from home, I feel sure the agents would have to bring down their prices somewhat. Unfortunately, it cannot be done here on a large scale, for there is always the native gentleman to reckon with. He is willing to pay whatever is asked as long as he gets his scarlet or yellow car furnished with all the brass fittings possible!"

"Seeing that the average motor cyclist out here is an amateur pure and simple, and very rarely goes beyond the cantonment limits, he is satisfied with the ordinary 3½ h.p. single or twin. My work is away from the large station, and over an area of nearly 30,000 square miles. I have to use my machine on good, indifferent, and bad roads, and country cart tracks, through nullahs, over rocks, and with the ever-present risk of a babul thorn (which will go through the leather of one's boot), or of a badly cut tyre caused by a dropped bullock shoe."

"The machine should be sprung behind as well as in front. It should have three speeds and a very good clutch, handle and not kick-starter, immense mudguards with plenty of space between them and the tyres, chain, or chain-cum-belt drive (the latter having a back wheel belt pulley of not more than 14in. diameter), big oil and grease caps (for grease is the only thing which will keep water out of the hubs in the rainy season), a three-gallon petrol tank, 28in. x 3in. wheels, larger tool bags than are now provided, every nut split-pinned or spring-washed, and a ground clearance of at least 6in. under the engine, and 7in. under the footboard. Personally, I am an 8 h.p. enthusiast, and my ideal machine would be very different from that just specified, which will suit the ordinary amateur for hard work."

"Unfortunately, I was compelled to buy a machine in India instead of being able to order it out from home. I

took delivery of a 1916 3½ h.p. War Office single-cylinder machine. It was not tuned up, but that was excused under the circumstances. It goes very nicely, otherwise."

"Many of the roads I have to ride over cross nullahs, and the water is about six or eight inches deep, except in the largest ones. My back wheel belt rim is nineteen inches in diameter, and I have never yet got through any water deeper than three inches without wetting my feet and afterwards having to dry the belt. You say, 'Fit a leather belt'—yes, and buy a new countershaft pulley every six months, and also scrape the belt every day throughout the dry season!"

"My tank only holds a gallon and a half, so I cannot go further than fifty miles out and back without replenishment, which is generally impossible."

"The machine should be rear sprung (most important, regarding the number of nuts lost)."

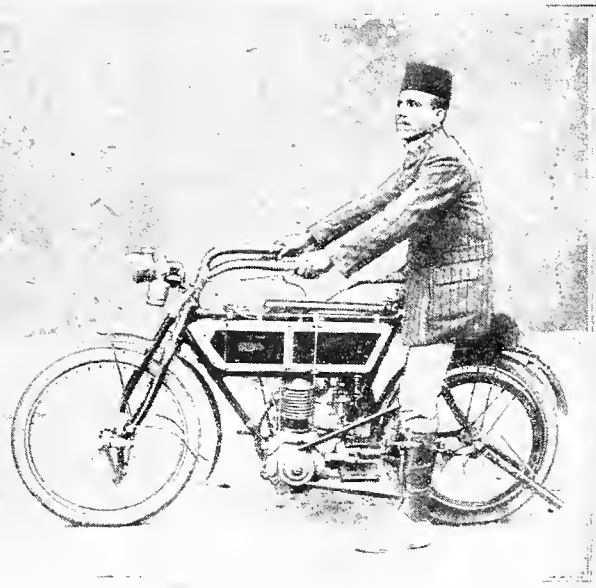
"The nuts on the fork shackles and brake rods are all split-pinned, but those supporting the carrier and footboards have already been renewed twice, having nothing in the way of even washers."

## Scarcity of Tyres.

MR. FOSTER BLACK, Cape Town, South Africa: "Tyres are somewhat scarce here in Cape Town. In certain sizes they command practically any price the dealer wishes to charge, and he gets it, too, for a tyre is a tyre, and a motor cycle is of no use without one."

## Manufacturers will not be told.

SEC.-LT. J. L. WRIGHT, B.E.F., France: "A certain well-known firm of British motor cycle manufacturers say, with characteristic egotism, that they have found their machines equally satisfactory for Colonial roads. Now before I left Australia I rode a friend's 1915 model; this machine was continually breaking its front fork springs. Rather contradictory, is it not? The fact is that British makers will not be told. I have been very much struck by the Colonial 6 h.p. Enfield combination. It is a very sensible idea to give the sidecar chassis a good ground clearance. Although one can dodge ruts solo, it is another proposition on a sidecar outfit. It is easy to see how it obtains the clearance, and there is no reason why other firms could not do the same. I recollect riding on a main road not twelve miles from Sydney, N.S.W., where the wheel ruts are so deep that one's footboards are level with the tops of the ruts as the machine is ridden along the bottom. Take the same condition on a wet day, when one has to ride on the top and the machine swerves into the ruts. The crank case often suffers, and frequently its day's work is done; but not the rider's, who has to do the pushing home."

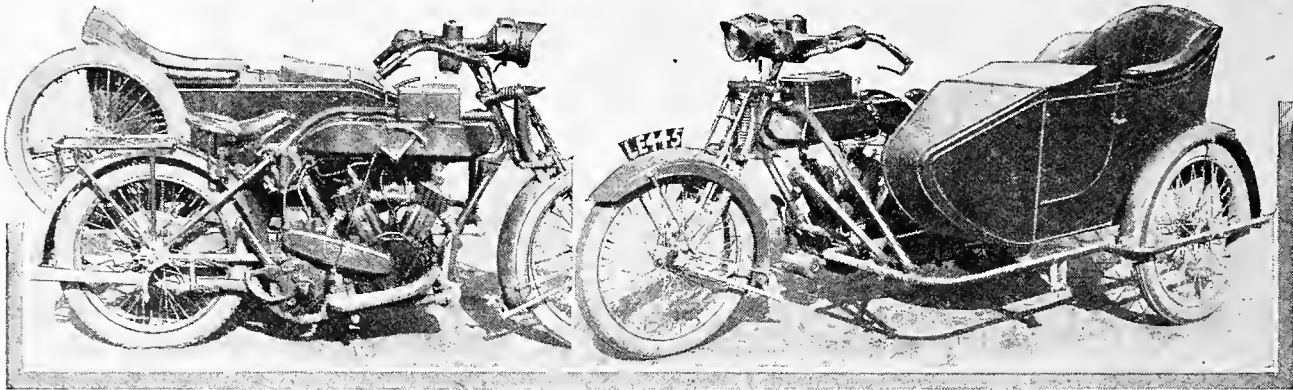


An Egyptian reader of *The Motor Cycle*, M. El Attar, of Cairo, and the Brown machine he has been using for the last eight years.



## THE 1916 MODEL 5-6 h.p. CLYNO.

A Sturdily-designed Three-speed Combination successfully used for Government Work. Amendments in Design, including Spring Seat-pillar.

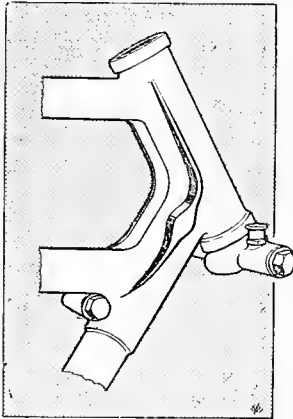


The 6 h.p. War Office model Clyno sidecar, our experiences with which over a lengthy period are described on this page.

IT is common knowledge that the works of the Clyno Engineering Co., of Wolverhampton, have for many months past been exerting full pressure in the production of sidecar

tion. Moreover, those makers who have had the advantage of war-zone experience have been able to incorporate improvements that otherwise might have taken years to evolve.

rider is the fact that every single nut is split-pinned or spring-washed. A Senspray carburetter, Best and Lloyd lubricator, Sphinx plugs, and Lucas fittings are among the equipment selected by the Government. The tyres used



Method of stiffening the head of the Clyno frame with exterior webs.

combinations mainly for the purpose of conveying machine guns, but also to be employed for transporting officers on tours of inspection. These sidecars are of the pleasure type, very much on the lines of those which gained such an enviable name in arduous competitions prior to the war. It is only during the last few weeks that the Clyno Co. has managed to get ahead of the enormous demands of the British and Allied Governments, and it goes without saying that private buyers have had to take a back seat during the company's great effort to satisfy Government requirements.

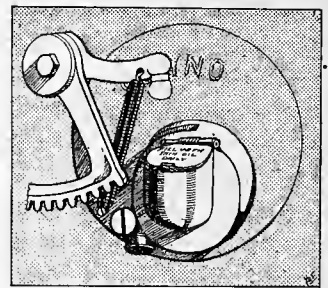
It has lately been our good fortune to have the use of one of the sidecars such as are supplied for the use of officers. There are a number of amendments in design embodied in this all-khaki model since it was last described in print, and consequently it would be of interest to touch briefly upon the specifica-

### Completeness of Detail.

The most striking feature of the outfit is its completeness. Every imaginable detail required on a trip of almost any length seems to be there, and, what is more important, there is a place for everything, and everything must be kept in its place.

Dealing first with the bicycle. There are fewer alterations in design on this portion than on the sidecar chassis, but we noticed that the latest pattern Brampton fork is now fitted, combining vertical and lateral movement, and greasers of a sensible size have been fitted to all the shackle pins. On the gear box an oil well is now provided for lubricating the clutch, and it is the work of a moment to inject oil *via* an accessibly placed spring-controlled lid.

A specially designed Brooks saddle giving a parallel motion is carried on a spring seat-pillar, whose action is controlled by double spiral springs. A point which will please the practical



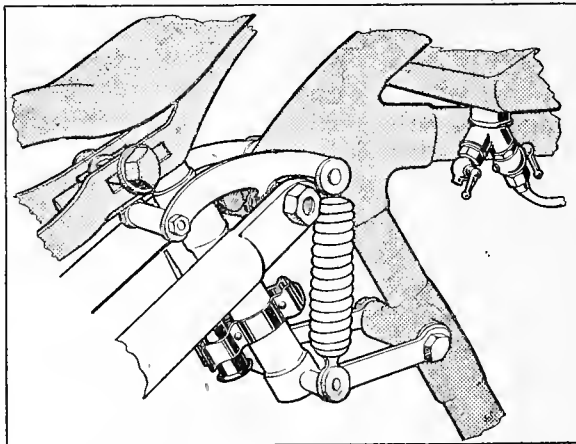
Brass oil cup for lubricating clutch.

throughout are Palmer's 3in. light car type, one steel-studded cover being included in the set, besides a spare tube. The petrol tank has a capacity of over two gallons, and the consumption with full load is in the neighbourhood of 55 m.p.g.

The mudguards are of very practical design, being wide, and are flatter than the average type, with plenty of clearance to prevent mud clogging the wheel.

### The Engine.

The engine itself is very little altered in outward appearance from the popular 5-6 h.p. Clyno engine which figured with success in competitions of pre-war days. It is of V type, with cylinders set at an angle of 55°, having a bore and stroke of 76x82 mm., giving a capacity of 744 c.c. The timing gear, however, has been redesigned, and on the road is wonderfully quiet in operation; indeed, we know of few V type engines in which the valve operation is so quiet, and it must be admitted that the clatter of the valve gear in the average V type



Clyno spring seat-pillar. The sketch also shows the two-way petrol tap and can for injecting petrol.

The 1916 Model 5-6 h.p. Clyno.— engine is one of its greatest drawbacks.

### The Transmission.

The three-speed countershaft gear box is of the sliding pinion type as usually fitted to motor cycles, but, of course, much lower gear ratios are needed for Overseas use than would be required at home.

The ratios respectively are 5½, 10½, and 17 to 1. Even with such a low top gear the machine is capable of quite forty miles an hour. The machine is extremely controllable, ticks along on the top gear at a very slow speed, and, as

a result, is extremely handy in traffic. The multiple-disc clutch is well up to its work, and appears capable of starting any load from rest in the smoothest possible manner.

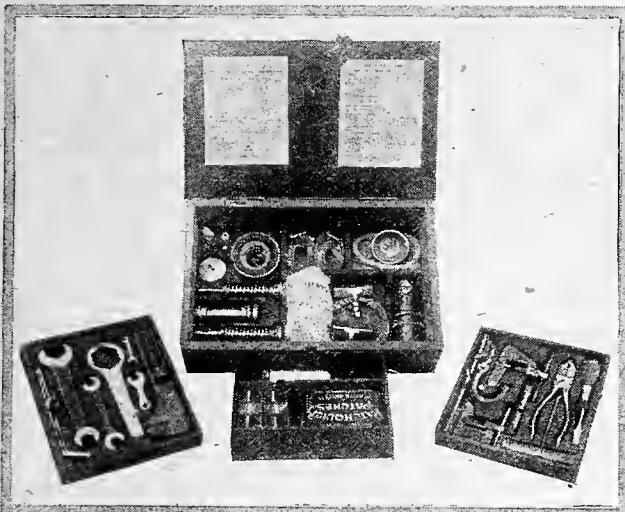
The control of the Clyno, by the way, is exactly as on a car, the left pedal controlling the clutch, and the one at the forward end of the right footboard the brake. The pedals themselves are of substantial sizes. The kick-starter pedal is on the right-hand side of the machine.

### A Very Strong Chassis.

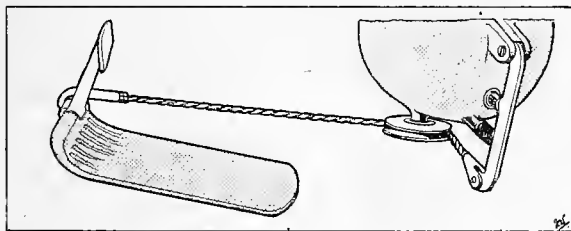
Turning now to the sidecar chassis, a stronger, more solid job it would be difficult to imagine. It is attached to the bicycle at five different points, one attachment being devised to keep the steering head rigid. There is a double saddle connection

result in some part or other giving way. Again, it must be remembered that these sidecars are not intended for normal requirements. Crossing commons, moorland, and badly cut up roads is their usual fare, and though work of this kind may be performed by an ordinary pleasure type sidecar, continuous use under such conditions would quickly bring to light weaknesses.

A word should be added with regard to the care and thought expended in storing the necessary spare parts and fittings, which should be an object lesson to the average motor cyclist, who is only too ready to cram his tools loosely into a pannier bag. In addition to the standard metal tool kit on the top tube a very complete kit is carried at the rear of the sidecar in a large wooden case, each tool being fitted in a specially shaped bed and removable by pressing one end, an action which causes the required tool to tip up. This arrangement is particularly good in view of the fact that tool kits are inspected in much



The neatly arranged tools and spares box as fitted to every W.D. Clyno sidecar outfit. As will be seen there is a special compartment for each tool and spare, the design and lay-out of the box and its contents being such as to render the finding of what is required an easy matter.



Foot-operated clutch control, showing use of stranded wire cable and pulley instead of rods.

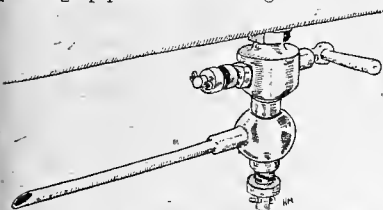
and a double front connection, in addition to the usual axle support, to prevent whip in the frame or torsional stresses which would immediately

the same way as a rifle, and it would at once be obvious if anything were missing. Minor parts, such as nuts, bolts, cups, cones, and spare balls, are carried in lined metal cases.

The spare wheel is fixed rigidly to the carrier, and can be instantly detached by the removal of a single wing nut.

### PETROL PRIMER TAP.

THE petrol primer tap illustrated has lately been placed on the market by Brown Bros., Ltd., 15, New-man Street, Oxford Street, W. In the position shown in the sketch the tap is "on." When the tap handle is downwards the tap is "off." The swinging portion which allows the priming pipe to be brought over the



A new petrol primer.

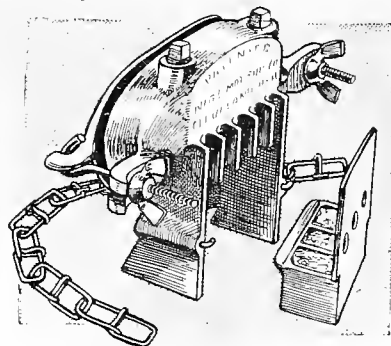
compression tap is also a tap in itself, and is only open when over the compression tap. This appears to be rather a disadvantage, as should one require to draw petrol from the tank for any reason, or moisten a rag with the spirit, it is impossible to do so unless the swing spout is in this one particular position.

### THE WIZARD STEAM VULCANISER.

ONE of the smallest and neatest steam vulcanisers yet supplied for the use of motor cyclists is the Wizard. It consists of an iron casting with a curved polished face, against which the tube to be mended is clamped, and a small detachable furnace consisting of asbestos, which is intended to be soaked in petrol. The main body is a hermetically sealed casting containing a small quantity of water.

After the puncture has been properly roughened and treated with sandpaper, it is wiped with petrol, and next a coat of cement, supplied with the outfit, is applied, and allowed to dry for ten minutes. Next a piece of raw rubber about 1in. in diameter is placed over the hole, and a piece of paper is laid over the raw rubber, so that it shall not stick to the vulcaniser. The tube is now clamped on to the vulcaniser; care should be taken to screw down both sides evenly. Next the fire-box should be filled level to the top with petrol and then turned upside down, so that all the petrol not absorbed is allowed to run away. The vulcaniser should then be stood on end, and the fire-box

placed in position and lighted, when it will burn for twenty minutes. It should be left five minutes after the flame has gone out. Finally the paper on the rubber should be washed off. It is necessary that the tube should be nearly



Wizard vulcaniser showing furnace detached.

cold before being replaced in the cover. What happens, of course, is that the water in the casting is converted into steam, and finally superheated, and this gives the correct temperature. The Wizard vulcaniser is sold by Brown Bros., Ltd.



## SPECIAL FEATURES

MUNITION WORKERS HILL-CLIMBING IN LAKELAND.  
THE 1916 MODEL 5-6 h.p. CLYNO SIDECAR. PETROL WASTE.

## TIME TO LIGHT LAMPS

"SUMMER" TIME.

June 1st	...	9.35 p.m.
" 3rd	...	9.37 "
" 5th	...	9.39 "
" 7th	...	9.41 "

## Special Care at Tadcaster.

The Automobile Association learns that motorists are being stopped and proceeded against for driving to the common danger in Tadcaster. This activity is stated to be due to the fact that a motor cyclist recently met with a fatal accident in this town through colliding with a cart.

## At a Repair Base.

Gordon I. Francis, who holds a commission in the A.S.C., M.T., is at a repair base in France. There is plenty of work to do, and the only breaks in the monotony of things are the occasional visits of enemy aircraft, to which, Francis tells us, the men rather look forward.

## Clutch Control.

A car driver who has lately taken to driving sidecar outfits informs us that he greatly prefers foot control for the clutch. This is only natural seeing that on all cars the clutch is foot-operated. It is only a matter of a few runs before a rider accustomed to cars would be quite at home with a hand-operated clutch on a motor cycle, but in case of emergency he will be more likely to do the right thing with a foot control than hand. Combined foot and hand control is a refinement that should increase after the war.

## Death of a Well-known Motor Cyclist.

We greatly regret to hear of the death of that pioneer motor cyclist, Stanley Webb, at the comparatively early age of 47, managing director of the Stanley Motor Belt and Fastener Co., 32, London Road, Bromley. Mr. Webb was chiefly responsible for the introduction of the rubber and canvas belt, and, though not the first actually to introduce the belt on the market, he manufactured an improved form which resulted in the almost universal introduction of this form of transmission. He was a motor cyclist whose experience dated from the very earliest days, and he was always a keen and enthusiastic rider. He frequently attended and took part in competitions, and among his favourite mounts were the Triumph and Douglas. Though stone deaf, he found his affliction no detriment to his enjoyment of the motor cycle. Mr. Webb's business will still be carried on by the company. We offer our most sincere sympathy to Mrs. Webb in her sad loss.

## Economy and Utility.

Tradesmen in difficulties with delivery of goods owing to lack of men should consider the claims of a sidecarrier, if they have not already done so. A couple of sidecarriers will do the work of three light horse vans, and, further, they can easily be driven by intelligent boys. This subject, together with many other aspects of the utility of the motor cycle, will be fully dealt with in a special number of *The Motor Cycle* to be published on June 29th.

## A Naval Motor Cyclist Injured.

We regret to see in the casualty list dated May 21st, reported in the press last Friday, that Flight-Lieutenant J. Forgan-Potts, R.N., was accidentally injured. Forgan-Potts was, before the war, an enthusiastic rider of an Indian, and a frequent participant in B.A.R.C. and B.M.C.R.C. race meetings at Brooklands. We wish him a speedy recovery.

## A New Ambulance Convoy.

The National Sporting Club is appealing for contributions to a fund to keep ambulance transport up to the requisite standard of efficiency. It is to be known as the British Sportsmen's Ambulance Fund, and the committee hopes to be able to provide a fleet of motor ambulances as a gift from the British sporting community. Contributions should be sent to the Treasurer of the Fund, The National Sporting Club, Covent Garden, W.C.

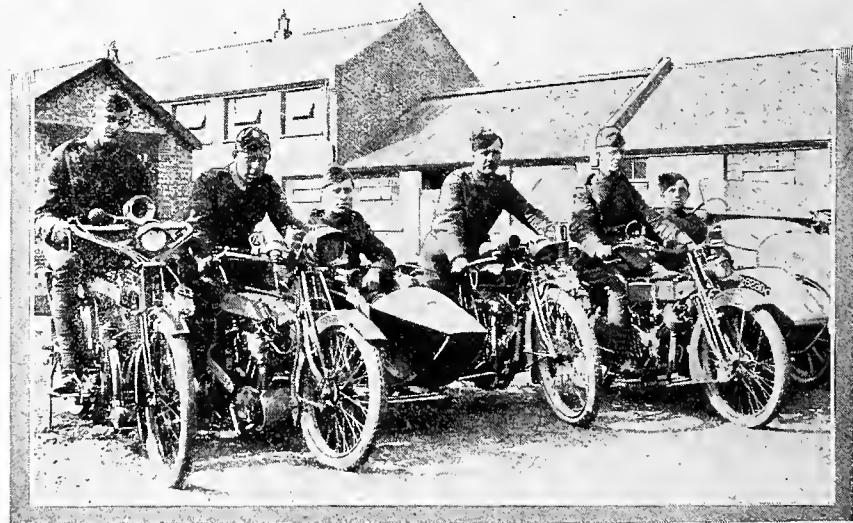
## Lamp Dimming Discs for Scotland.

Motor cyclists travelling in Scotland are reminded that, as from last Thursday, further lighting regulations for Scotland came into force. These regulations provide that when travelling through the following towns: Aberdeen, Arbroath, Dundee, Dunfermline, Dysart, Edinburgh, Kirkcaldy, Leith, and Montrose, all lamps must be covered with a disc similar to the discs now being enforced in many parts of England and Wales. Lamps must be alight from half-an-hour after sunset until half-an-hour before sunrise.

## Results of an Irish Trial.

The result of the Easter Monday reliability trial held under the auspices of the Dublin and District M.C.C. has been announced as follows. Only two of the five finishers, C. B. Franklin (7.9 h.p. Indian sc.) and A. Carton (7 h.p. Indian sc.), secured full marks, both being within the limits of time at the secret and open checks, and completing the non-stop sections without stops. Franklin wins the Dunlop Rubber Co.'s challenge cup by reason of his variation from schedule being the smaller. Silver medals were won by J. Carter (7.9 h.p. American Excelsior), 98 marks; and S. Redmond (3½ h.p. Indian), 97 marks. A bronze medal was awarded to T. Wood (2½ h.p. Allon).

The report (delayed owing to the Irish rebellion) of this trial appeared in *The Motor Cycle* of May 11th, page 447.



MOTOR CYCLISTS ATTACHED TO THE R.F.C. EXPERIMENTAL WORKS, the C.O. of which is Capt. A. M. Lov.

The machine on the extreme right, driven by Corporal Goodwin, is a standard model 3½ h.p. P. and M., as supplied to the Flying Corps; next comes a 7 h.p. Indian, then a 7 h.p. Zenith, while the machine on the extreme left is a 3½ h.p. Humber. The last three machines are mainly used for conveying the transport drivers from their billets to the factory.

**The National War Funds.**

At the week-end the principal war funds stood as follow:

The Prince of Wales's National Relief Fund (£5,258,000 distributed)	£5,877,251	0	0
Fund for the Sick and Wounded	3,750,000	0	0
Tobacco Fund	104,197	0	0
The Queen's Work for Women Fund	169,449	3	6
The British Farmers' Red Cross Fund	300,000	0	0

**A Progressive Colonial Club.**

We have received a copy of the 1916 handbook of the Cape Peninsula M.C.C. The doings of this club, the headquarters of which are at Cape Town, South Africa, are often described in our pages, and from these and the contents of the booklet one gathers that it is a very live organisation. At the time the book was printed forty-five members of the club were known to be on active service.

**A Victorian Flexibility Test.**

The Victorian M.C.C. held a flexibility hill-climb at Rosanna, near Heidelberg, on March 25th. The rider showing the greatest difference between his fastest and slowest effort was adjudged the winner. Results:

- SOLOS, UNDER 600 c.c.  
 1. C. Woods (2½ Doughlas)  
 2. E. Tyler (3½ Triumph)  
 SOLOS, ABOVE 600 c.c.  
 1. J. Booth (Powerplus Indian)  
 2. A. Jenkins (6 J.A.P.)  
 SIDECARS.  
 1. J. H. Rhodes (Powerplus Indian sc.)  
 2. A. McCall (6 J.A.P. sc.)

**Sunday Motoring.**

As showing how the anti-motor brigade is straining to manufacture a case, *The Times* on Monday stated that of the motor cyclists noticed on the road on Sunday the majority were of military age. What of it? Every man seen is (1) called up, (2) has been rejected, (3) is a munition worker, or (4) a tribunal has decided he is doing better work at home. Such being the case, why deprive him of a little relaxation from his labours?

**Motor Cyclist Volunteers Wanted.**

Mr. S. W. Phillpott, who has recently been appointed motor cyclist officer for the Port of Liverpool Heavy Car Battalion of the National Motor Volunteers, informs us that vacancies exist in the motor cyclists' section of his corps. Motor cyclists interested should communicate with Mr. Phillpott at 22, Rodney Street, Liverpool.

**A Sporting Offer.**

On Monday last, at West Bromwich, a motor cyclist was fined 20s. for riding to the danger of the public. The police alleged that defendant was travelling at 20 m.p.h. and turned a dangerous corner without slowing down. Defendant said his machine was an old one, and he was prepared to let the policeman ride it, and if he could get 20 m.p.h. out of it he would give it to him. Apparently this sporting offer proved of little avail.

**Motor Cycling in the East Indies.**

Roads in Sumatra and Java are excellent, especially in the latter island. Java is more highly developed than Sumatra; there are over 10,000 miles of good roads. The latter, combined with beautiful scenery, make motor cycling very delightful.

**Hill-climbing in Western Australia.**

A local record was made on the occasion of a hill-climb held by the West Australian M.C.C. on the Welshpool road, Kalamunda, on March 26th. Results:

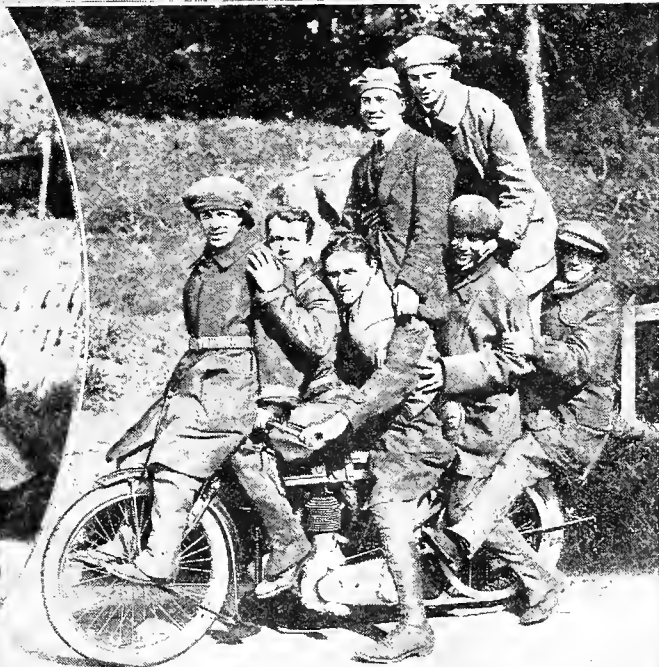
- 500 c.c. CLASS.  
 1. H. Norton (B.S.A.) Record for hill.  
 2. Wigmore (Triumph)  
 3. Hope (Sunbeam)  
 OPEN CLASS.  
 1. Hope (Sunbeam)  
 2. Norton (B.S.A.)  
 3. Wigmore (Triumph)

**Of Your Charity—**

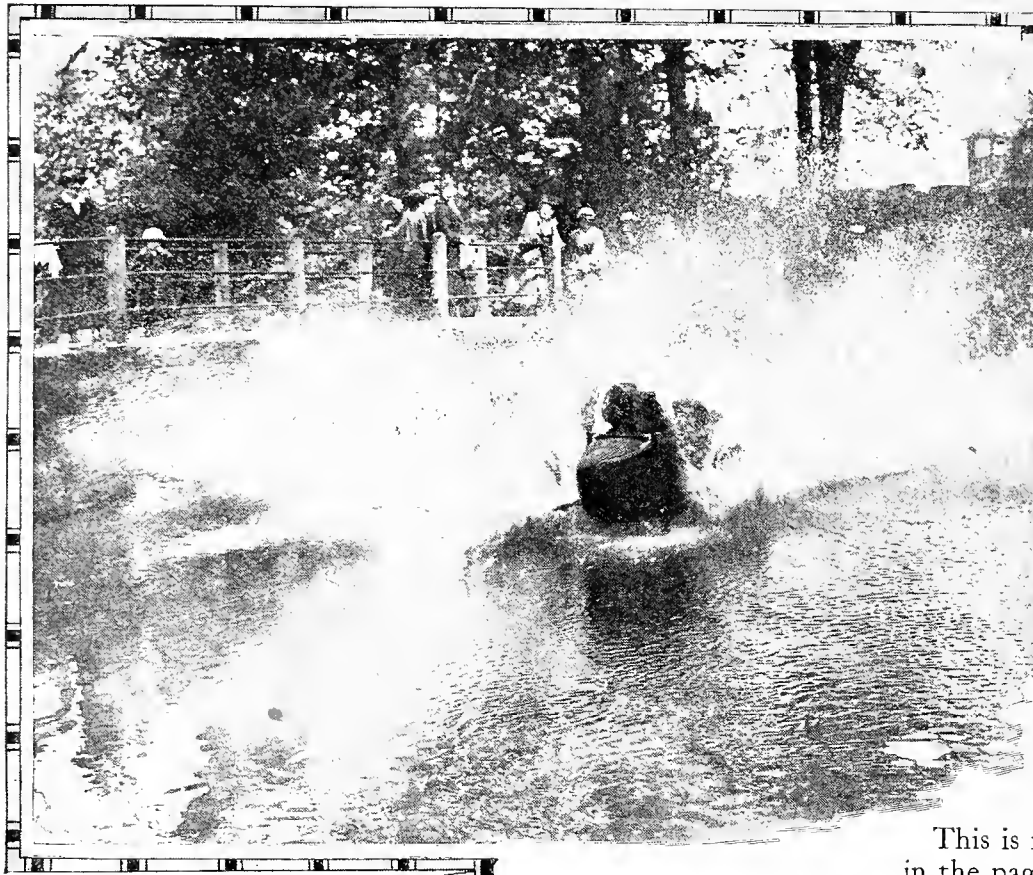
We are informed that the North Birmingham A.C. is starting a fund to assist the widow and children of Sgt. Hubbard, of the Royal Engineers, who was killed in a motor accident at Dunstable last year. Sgt. Hubbard had seen much severe fighting in France, and returned home wounded, but as he was not on military duty when he met his death, his widow and children are not receiving any pension. Donations should be sent to Mr. A. W. Thrush (hon. secretary), 34, Reservoir Road, Erdington, Birmingham.

**THE LIMIT IN OVERLOADING!**

(Left) 4 h.p. 1916 model Triumph sidecar with eleven men aboard.  
 (Right) Solo Triumph with seven men. The machine has actually climbed Stoneleigh Hill, Warwickshire, as shown, and when the top was reached it was found that only one man had been dropped.

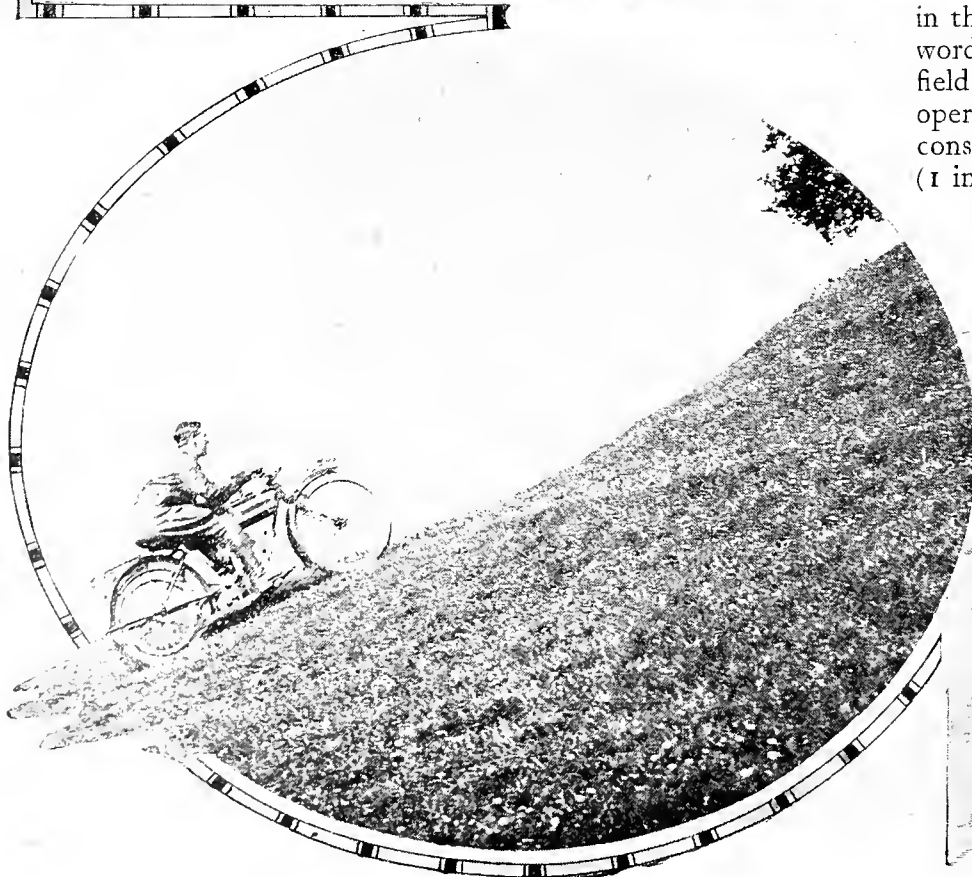


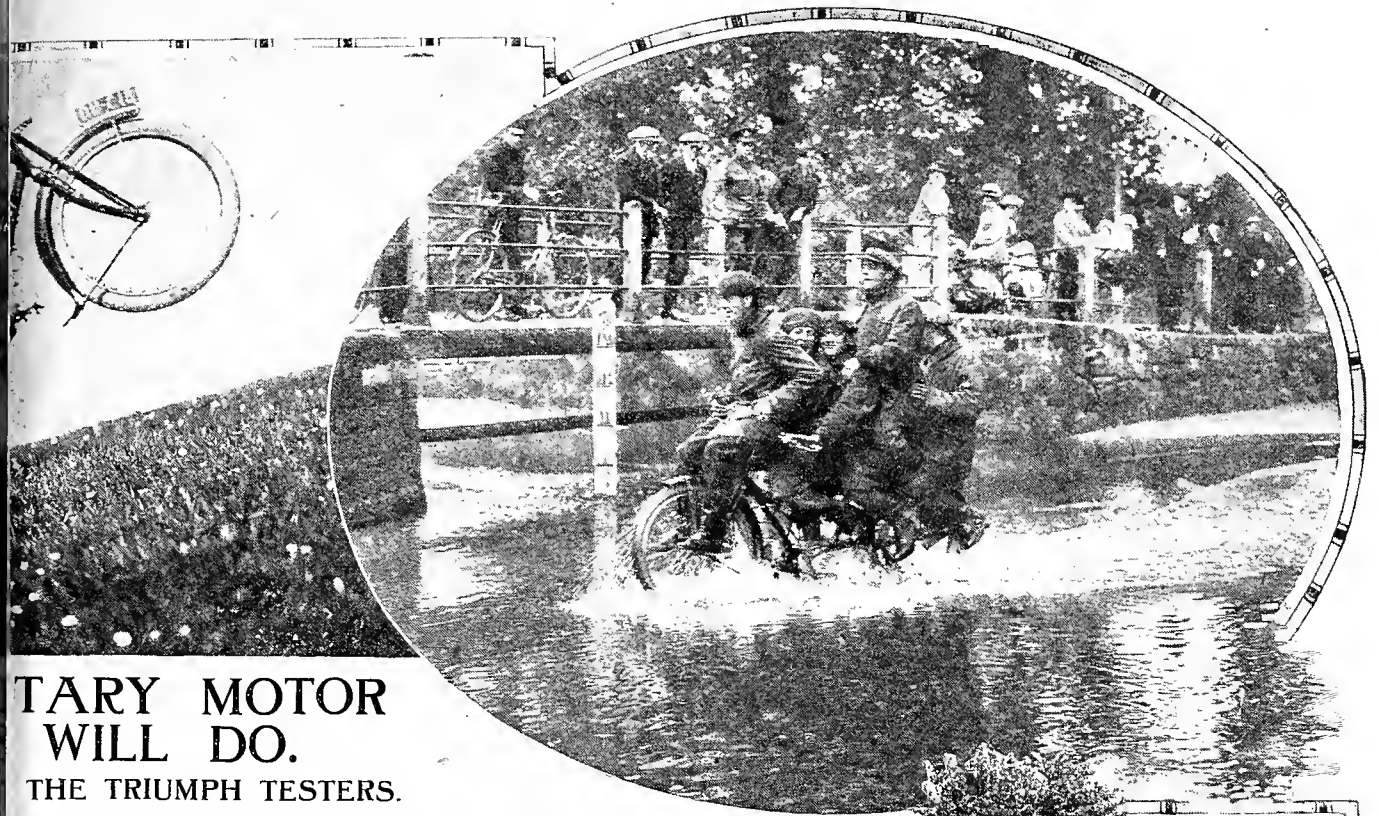




## WHAT M CYCL A FIELD DAY

This is not the first time the in the pages of *The Motor Cycle word* in freak riding. The field day organised by the T operator. The tests the milita consisting as they did of rid (1 in 10 steepest) with six men

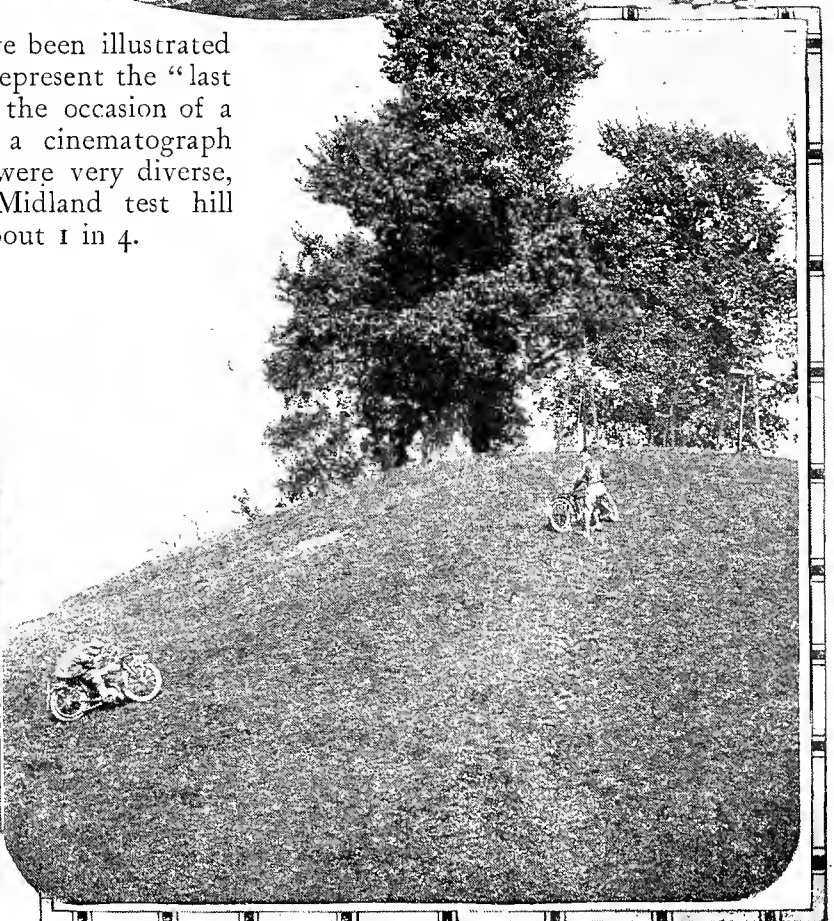




## TARY MOTOR WILL DO.

THE TRIUMPH TESTERS.

Ordinary performances of works' testers have been illustrated. We think that the scenes here illustrated represent the "last" photographs were taken one day last week on the occasion of a Triumph Company, mainly for the benefit of a cinematograph film of a 4 h.p. Triumphs were put through were very diverse, though a ford, climbing a well-known Midland test hill, and climbing a big grass mound of about 1 in 4.



## Average Prices OF Second-hand Machines.

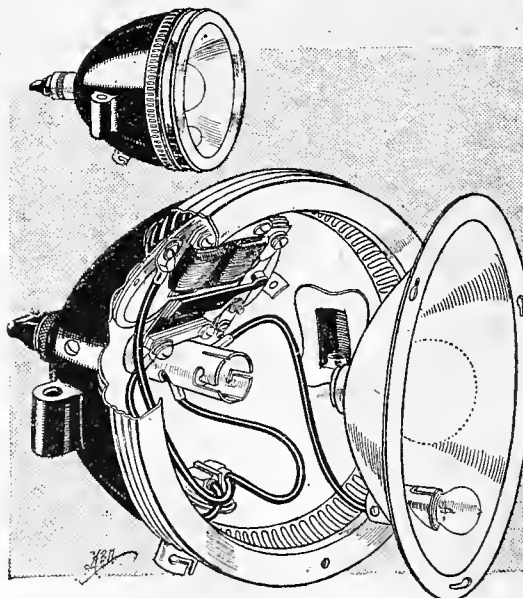
From "The Motor Cycle" of May 25th.

Make.	Year.	H.P.	Average for last week.	Latest weekly average obtainable
A.J.S. ....	1915	6 3-sp. sidecar ..	—	£83
" .....	1914	6 3-sp. sidecar ..	—	£93
" .....	1913	6 3-sp. sidecar ..	—	£93
" .....	1915	2 3-speed .....	—	£44
" .....	1914	2 3-speed .....	—	£38
Allou .....	1916	2 2-stroke .....	£39	—
" .....	1915	2 2-stroke .....	—	£34
Bat .....	1915	8 3-sp. sidecar ..	—	£70
Bradbury ..	1914	6 3-sp. sidecar ..	—	£48
" .....	1913	3 1-sidecar .....	£26	—
B.S.A. ....	1916	4 2-speed .....	—	£57
" .....	1915	4 2-speed .....	—	£56
" .....	1914	4 2-speed .....	—	£45
" .....	1913	4 2-speed .....	—	£50
" .....	1914	4 2-speed .....	—	£43
Calthorpe ..	1915	2 2-speed .....	£28	—
" .....	1914	2 2-speed .....	—	£19
Campion ..	1915	2 2-stroke .....	—	£21
" .....	1914	6 1-sidecar .....	—	£51
Clyno .....	1914	6 3-sp. sidecar ..	—	£48
" .....	1913	6 3-sp. sidecar ..	—	£53
Douglas ..	1915	2 3-speed .....	—	£45
" .....	1915	2 3-speed .....	—	£40
" .....	1915	2 T.T. ....	—	£41
" .....	1915	4 3-sp. sidecar ..	—	£66
" .....	1914	2 3-speed .....	£36	—
" .....	1914	2 3-sp. T.T. ....	£36	—
Enfield ..	1916	6 2-sp. sidecar ..	—	£87
" .....	1915	6 2-sp. sidecar ..	—	£74
" .....	1915	6 2-sp. sidecar ..	—	£67
" .....	1914	6 2-sp. sidecar ..	£59	—
" .....	1913	6 2-sp. sidecar ..	—	£46
" .....	1915	3 2-speed .....	£41	—
" .....	1914	3 2-speed .....	—	£34
Excelsior (A)	1915	7 3-speed .....	—	£50
H.-Davidson	1915	8 3-sp. sidecar ..	£69	—
" .....	1915	4 2-speed .....	—	£44
Hobart .....	1915	3 2-stroke .....	—	£30
Humber .....	1913	2 2-sp. sidecar ..	£26	—
Indian .....	1915	7 3-sp. sidecar ..	£73	—
" .....	1915	5 3-speed .....	—	£54
" .....	1915	5 3-sp. sidecar ..	—	£60
" .....	1915	3 3-speed .....	—	£49
" .....	1914	7 2-speed .....	—	£42
" .....	1914	7 2 sp. sidecar ..	£47	—
" .....	1914	7 T.T. ....	—	£34
James .....	1915	4 3-sp. sidecar ..	—	£56
" .....	1915	4 2-sp. 2-stroke ..	—	£25
" .....	1914	4 3-sp. sidecar ..	£44	—
Levis .....	1915	Popular .....	£23	—
" .....	1914	2-speed .....	—	£22
Matchless ..	1915	8 3-sp. sidecar ..	£81	—
" .....	1914	8 3-sp. sidecar ..	£76	—
" .....	1913	8 3-sp. sidecar ..	—	£50
" .....	1913	6 2-sp. sidecar ..	£39	—
Motosacoche	1913	2 1-multi gear ..	—	£14
New Hudson	1915	2 2-speed .....	—	£28
" .....	1914	6 3-sp. sidecar ..	—	£41
New Imperial	1916	2 2-speed .....	£31	—
" .....	1915	2 2-speed .....	—	£27
O.K. ....	1915	Junior 2-speed ..	—	£22
P. & M. ....	1914	3 2-sp. sidecar ..	£50	—
" .....	1913	3 2-sp. sidecar ..	—	£37
Premier .....	1914	2 3-speed .....	—	£20
" .....	1914	3 3-sp. sidecar ..	—	£16
Rex .....	1914	6 2-sp. sidecar ..	£52	—
" .....	1913	6 2-sp. sidecar ..	—	£34
Rover .....	1915	3 3-sp. sidecar ..	—	£50
" .....	1914	3 3-sp. sidecar ..	—	£42
" .....	1913	3 3-sp. sidecar ..	£42	—
" .....	1912	3 clutch .....	—	£23
Royal Ruby	1915	2 2-stroke .....	—	£27
Rudge .....	1914	3 Multi sidecar ..	—	£44
" .....	1914	3 Multi .....	—	£37
" .....	1914	5-6 Multi sidecar ..	—	£41
" .....	1913	3 Multi .....	—	£28
" .....	1913	3 Multi sidecar ..	—	£35
Scott .....	1915	3 2-sp. sidecar ..	—	£50
" .....	1914	3 2-sp. sidecar ..	—	£48
" .....	1913	3 2-sp. sidecar ..	£34	—
Sunbeam .....	1915	3 3-speed .....	—	£60
" .....	1914	6 5-sp. sidecar ..	—	£79
Triumph .....	1915	2 2-sp. 2-stroke ..	—	£34
" .....	1914	4 3-speed .....	—	£10
" .....	1914	4 3-sp. sidecar ..	—	£48
" .....	1913	3 3-speed .....	—	£33
" .....	1914	3 3-sp. sidecar ..	—	£39
Williamson ..	1914	8 2-sp. sidecar ..	—	£73
Wolf .....	1915	1 sidecar .....	—	£43
Zenith .....	1914	6 Gradua sidecar ..	—	£48
" .....	1913	8 Gradua sidecar ..	—	£52
" .....	1913	6 Gradua sidecar ..	—	£39

WE have always been led to understand that one of the minor advantages of conscription would be the doing away of the insinuations that such and such a man ought to be in khaki, etc. In the earlier days of the war many unpleasant incidents arose through persons being dubbed slackers when they may have been, if the truth were known, physically unfit for military service. Now that conscription has come there should be no more of this, because every man of military age who is not in khaki will have been dealt with by a tribunal, or else have been rejected.

### An Empty Statement.

However, this seems to have been overlooked in one quarter, and the strange part about it is that it is in a quarter from which the aforesaid advantage of conscription was so emphasised in the course of the daily press campaign for universal service. We are led to make these remarks by the report of a motor traffic census that appeared in *The Times* of last Monday. The census covered the main outlets of London, and took place on Sunday morning. In the report appears the following: "It was particularly observed that, practically every civilian motor cyclist was of military age." Now this statement really weakens *The Times's* anti-motoring campaign, for with conscription in force it is obvious that such riders are either (1) rejects, (2) on Government work, (3) have been temporarily exempted from military service by tribunals, or (4) are due to report for military service in the course of a few weeks. The emptiness of such a remark as that quoted needs no further emphasis on our part, for its unreasonableness is obvious.



Combined electric lamp and horn as fitted to the 1916 model Henderson described on May 18th.

*The Times* traffic census is part of a campaign against "pleasure" motoring now being conducted by a section of the press. If there is, or likely to be, any shortage of petrol for military and naval purposes, the Government has only to commandeer the whole supply, or to make a plain statement that petrol is scarce, and we are convinced that all users of motor vehicles will be prepared to reduce the little recreative motoring they indulge in—and regard as necessary—or give it up altogether. But until it is definitely announced by the Government that such is the case, we fail to see any reason why motoring should be singled out for censure any more than theatres, expensive restaurant dinners, golf, and other forms of pleasure.

In the meanwhile, the report of the Petrol Committee is eagerly awaited. Various reports have appeared in the daily press as to the recommendations of the Committee in the form of a restricted petrol supply, but it is all pure conjecture.

*En passant*, a full page in the same issue of *The Times* as the above extracts contains attractive displayed notices of expensive hotels all over the country inviting readers to spend their Whitsun holidays there. This is consistency in economy on the part of *The Times*, we presume.

## A COMBINED LAMP AND HORN.

THIS novel and practical accessory was referred to briefly in our description of the latest four-cylinder Henderson in our issue of May 18th. To combine both lamp and horn is certainly an ingenious idea, and, if these two important accessories can be combined, we do not see why it should not be done, as it is a decided advantage, there being fewer accessories on the handle-bars, and in consequence less to clean.

Our illustration shows how easily the reflector of the lamp may be removed, so that the wiring connections and the buzzer itself can be reached. It will be noticed also that there is a series of louvres immediately behind the front of the lamp, and through these the sound issues on the horn being operated. The whole idea seems to be a happy combination in which the efficiency of either part is in no way impaired. As a horn it emits a penetrating but not objectionable note, and as a lamp it gives an excellent light, and is, moreover, provided with a dimmer bulb for town riding. At the rear of the lamp is the switch, while the milled ring shown in the illustration is used for focussing the main bulb.



# "THE MOTOR CYCLE" RECRUITING SECTION.

Central Office for Heavy Section, Machine Gun Corps and Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

**L**AST week motor cyclist and car driver recruits who presented themselves at Coventry and Nottingham were able to choose between the Motor Machine Gun Service and the Heavy Section Machine Gun Corps, the former section embracing the sidecar machine gun batteries and the latter all the different branches of armoured car work. Among the recruits were a goodly number of men who had hitherto been employed in reserved occupations or engaged on Government work, and have since been released.

It is not expected that there will be any further vacancies in the Motor Machine Gun Service for the time being, as on Tuesday last, the 30th ult., the Editor of this journal, Mr. Geoffrey Smith, attended at the Coventry Recruiting Office, with the object of filling up the ranks of the M.M.G.S.

There were over fifty men at Coventry last week, and those accepted were billeted out the same evening in Coventry, and left next morning for their different training camps. The same day another batch of men were being tested in Nottingham.

There are still vacancies in the Heavy Section Machine Gun Corps for experienced motor cyclists and car drivers, and a limited number of men with engineering knowledge may be accepted for this corps.

The following inspections have been arranged for next week:

**COVENTRY.**—Recruiting Office, Masonic Buildings, Tuesday, June 6th, 11.30 a.m. to 4.30 p.m.

**MANCHESTER.**—Messrs. Iliffe and Sons Ltd., Century Buildings, 199, Deansgate, June 7th, 2.30 to 4.30 p.m.

Men desiring to enlist who conform to the conditions of enlistment given on this page need not write at all, but should attend at one or other of the addresses named.

The conditions of enlistment are appended:

Applicants must be experienced car drivers or motor cyclists, able to execute ordinary running repairs. A limited number of men with engineering knowledge, and preferably previous military training will be accepted.

Pay 1s. 2½d. per day, all found.

Enlistment for duration of war. Usual separation or dependants' allowance.

Age limit, 19 to 40. Applicants must be fit for general service abroad or for garrison duty abroad.

## "THE MOTOR CYCLE" RECRUITING SECTION.

**T**HIS Section was instituted with the sole object of assisting readers and directing them to the many different branches of the Army and Navy, for which their special knowledge suited them. At the outbreak of war numerous letters reached us (and continue to arrive) from men at home and overseas possessed of motor engineering knowledge, explaining their difficulty in obtaining particulars of Specialised Sections (notably the Motor Sections), Recruiting Officers being invariably occupied by the demands of the line regiments. The Editor is Inspecting Officer for the M.M.G.S., Heavy Section, Machine Gun Corps, and R.E. Despatch Riders. Throughout the work has been purely honorary, and Recruiting Commissions have not been accepted. To date 9,656 readers have taken advantage of our proffered assistance.

Below will be found a list of recruits accepted for service last week:

Andrews, J., Oxford.  
Armstrong, F. N., Southampton.  
Audley, R. E., Sidmouth.  
Baker, H. M., Llanfairfechan.  
Baker, L. C. H., Seven Kings.  
Balderson, W. E., Lincoln.  
Bott, R., Devizes.  
Brennand, G., Kendal.  
Brown, J. E., Kenilworth.  
Chapple, S. T., Bristol.  
Clark, J. C., Wembley.  
Cobb, A., Boston.  
Cooper, A., Bethnal Green.  
Coton, P. C., Bourne-mouth.  
Crowle, Jr. H., Fraddon.  
Crowther, S. H., Workop.  
Douglas, D. S., Mansfield.  
Dyer, W. H., Cleveland.  
Everson, G., Kendal.  
Fincher, J., Liverpool.  
Fletcher, W. H., Manchester.  
Foot, G. C., Rhyl.  
Franks, E., Workop.  
Goehbels, J., Wisbech.  
Goode, J. G. A., Wellingborough.  
Gregory, G., Giltbrook.  
Hunter, W. J., Newcastle-on-Tyne.  
Hyde, J., Derby.  
Iron, E. S. W., Tottenham.  
Jackson, E., Grimsby.  
Johns, T. J., Henthon.  
Kerr, T., London.  
Kershaw, C., Liversedge.  
Kirby, A. L., Kirtou Lindsey.  
Latham, P. A., Coventry.  
Leward, C., Stoke Newington.  
Lindon, E. O., Rugby.  
Llewellyn, B. H., Birmingham.  
Lodge, J. A., Deunholme.  
Marsden, A., Darwen.  
Marsh, S. A., Richmond.  
Marshall, A. E., Bath.  
Millward, A., Denton.  
Moore, W. C., Ilkeston.  
Mowbray, L., Sibsey.  
Murrell, J. W., Haywards Heath.  
Neal, J., Nuneaton.  
Padget, W. G. D., Birmingham.  
Pennell, A. J., Walsall.  
Pickett, A. L., Watlington.  
Pickford, L. T., Rugby.  
Pilling, J. P. T., Bridlington.  
Poole, W. E. G., Wrockwardine Wood.  
Purcell, H. S., Andlem.  
Purcell, J. A., Audlem.  
Purday, H., Nottingham.  
Reynolds, S., London.  
Robinson, E., Nottingham.  
Roddick, P. W., East Dereham.  
Rose, A. E., Charteris.  
Rowbottom, A. M., Ripon.  
Runnall, R. H., Liskeard.  
Sawyer, A., Grimsby.  
Sheppard, A. C., Bath.  
Silvester, G., Fleet.  
Smaller, S., Grimsby.  
Spark, T. E., Sunderland.  
Stevenson, G. B., Rugby.  
Sweeting, A., Anlaby.  
Thorn, A., London.  
Thornev, E., New Mills.  
Tiffin, M. J., Kirkoswald.  
Vincent, G. J., Chesham.  
Walton, F., Walsall.  
Wanklyn, A. M. G., Golder's Green.  
Watson, W. K., Kendal.  
Webb, A., London.  
Welbeck, H. I., Ravensthorpe.  
Wells, A. R., Chatteris.  
White, F. C., Middlesbrough.  
Willer, H. L., Cudney.  
Wilson, R. L., Beverley.



SOME MEN OF THE No. 8 BATTERY MOTOR MACHINE GUN SECTION.

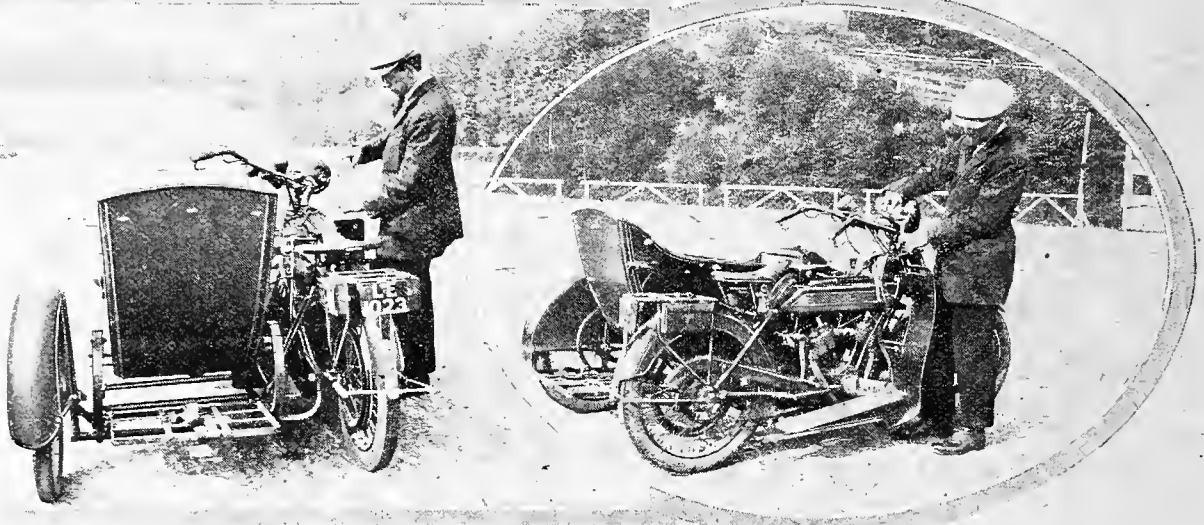
From left to right: Chief-mechanic Ernest Smith; Battery Sgt.-Maj. C. F. Hewitt and Mechanic R. Bownass. We referred to Smith and Bownass, both of whom are well-known to many readers as T.T. riders, in a recent issue. Hewitt was formerly at a Cheltenham garage.

The Motor Machine Gun Service is the motor cyclists' own special corps, and an opportunity is presented by which fellow motor cyclists may assist in brightening the lives of the men in training. A band is being raised, but a few instruments are required to complete it, and Lt.-Col. R. J. Colson, Commanding Officer of the training centre, will appreciate offers of two cornets, a clarinet, a trombone, and a big bass violin.



# ATTEMPT TO REDUCE THE PETROL BILL.

A Further Test of "Spots."



The second "Spots" test on Brooklands with a 1916 model 6 h.p. Enfield.

**W**E were so much interested by the results obtained in the case of the test with a P. and M. described in our last issue that we were determined to carry out a further one on a different make of machine fitted with a different carburetter. In this case we used a 6 h.p. 1916 Enfield, fitted with a Watford speedometer which was previously tested over a mile and found to be accurate.

The procedure, as before, was to measure out eight ounces (1-20th gallon) in a graduated glass, pour it into the supplementary tank, start on the line and run as far as possible on the measured amount. So as to use the maximum amount of petrol out of the supplementary tank the machine was pushed off to start. At the first attempt on pure petrol 3.8 miles were covered (76 miles per gallon); on the second test

the mileage covered was 3.7 miles (74 miles per gallon).

The first trial with "Spots" produced 3.7 miles, and the second test 3.8 miles.

It will be seen, therefore, that there was no difference with this particular machine and carburetter, which was an Amac, between petrol treated with "Spots" and plain petrol. During the test the machine was driven as nearly as possible at twenty miles an hour, and as much air was given as the carburetter would take. Both for the tests with the P. and M. and with the Enfield the weather conditions were ideal.

Although invited to be present, Mr. C. P. Preston, who is responsible for the sale and production of "Spots," was unable to put in an appearance.

## TOUCH WOOD!

**C**AN any reader beat the following as a narrow escape from what might have proved a most serious accident? It prompts a suggestion for a sort of competition, viz., "Who has had the luckiest experience by *not* being in a bad smash?"

I took a 1912  $3\frac{1}{2}$  h.p. motor cycle with sidecar from a town in the neighbourhood of Leeds, and, being pressed for time to fulfil an appointment with business friends in Cheshire, hurried over some of the famous horrible setts and through some of the thickly populated towns of the West Riding, including Huddersfield. This town, by the way, has a motor-ing reputation: there are so many motor bicycles and cars that it is said there is one for every seventeen inhabitants, or seventeen motors to each inhabitant, I forget which. Anyway, there are plenty. The hills they must face regularly are terrible. One, at least three miles long, leads bumpily towards Stanedge

Moors. Here the sandy highway is unfenced and the scenery wild. We had a tyre burst, big enough for me to put my fist through, but that was as nothing to what followed. After repairing we sailed all right over the lonesome country, with not even a bit of barbed wire (!) to stop the sidecar passenger, if he had been thrown out, from rolling down a steep, boulder-strewn slope for scores of yards. It is nearly like riding on the edge of a cliff. But there was no accident. . . . till we entered Ashton, when both gears went awry. We pushed the turnout into a cart shed, and took away the sidecar so as to get at the gear more easily.

Will it be believed that, as the *empty* sidecar was then being wheeled out of the way, the stay supporting the axle of the wheel gave way?

The remarkable thing, of course, is that the fracture did not reveal itself whilst the machine was pounding its way over the moors.

S.L.



# Letters To the Editor

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

## Naphtha as a Fuel.

Sir,—I am told that a car owner in this district (Jedburgh) is getting good results from naphtha. How would this fuel affect the running of a  $3\frac{1}{2}$  h.p. engine, and has it been tried? I am sure if your readers could give any information on the subject it would be welcomed by a very large number of riders, in view of the high price of petrol. KS 188.

## Enclosed or Open Chains.

Sir,—Re the above-named article, I do not agree with the writer where he states that "It is quite a fallacy that any harm can be done to the material of a chain by boiling it in grease," because to do so would spoil the best chain ever made.

I have no objection to immersing the chain in melted grease; in fact, it is a good way to lubricate a chain, although personally I never did it, but care ought to be taken not to allow the grease to be more than fluid; but to boil—well, the boiling point of grease is somewhere about 600° Fahr., and the rollers of a chain will be tempered at a temperature between 430° to 450° Fahr.

I merely point this out, as there are a number of readers who get their tips out of *The Motor Cycle*, and follow the directions to the letter. I have done the same myself many a time when I thought the tip was right.

J. SWAINE.

## The Taxation of Motor Cycles.

Sir,—If many people speak, perhaps the motorist may gain a little consideration. That is my reason for writing.

The suggested increases in motor licences are extortionate. The owner of a second-hand 4 h.p. cycle and sidecar costing £25 will have to pay about £3 3s. tax, and should, for his own peace of mind, pay £3 3s. third party risk insurance premium. He thus has to pay £6 6s. a year before he can start driving. We know that indirect taxation is very unsatisfactory, but as regards motoring—which tends to impoverish the community's roads—a tax on fuel is reasonable. It would be far preferable to increased licences. The amount paid by the consumer would then be proportionate to the damage caused to the roads.

Again, does the Government realise that in increasing licences it lays a premium on motoring as many miles as possible? Owners will not, and should not, be asked to give up their motors altogether, because they are nowadays kept as much for utility as for luxury. Therefore, granted that a licence is taken out, the motorist will use it for as many miles as possible. The charge per mile on that item decreases, and—in excess of a certain distance—motor travelling becomes cheaper than rail.

Petrol distribution should be controlled by the Government, at fair prices, and that at once. The private owner does not wish to motor at the expense of the Army or Navy, and does not mind his supplies being curtailed to the utmost limit, but he wants it done fairly and above board.

On the question of Sunday motoring, does it matter to anyone when the owner uses his petrol? Did the 1916 licences restrict motoring to week-days only? If I take a friend to a country railway station six miles from my home on a Sunday evening, is that joy-riding? Bah! Let us have a little intelligence displayed. S. G. BARNARD.

Sir,—This seems to me to be very unjust on licence holders who took their licences out before the proposed increase, as the licence states that the holder is entitled to the use

of a motor cycle for one year, from Jan. 1st to Dec. 31st. My case is, I dare say, only one of many. I use my motor cycle at fine week-ends only to take my wife out, who is unable to walk far, and it is only by the greatest economy and giving up all other forms of enjoyment that I can manage to go in for this, as my income is well under £120 a year. My total mileage would be about 1,200 miles in the year. If the increase on existing licences is persisted in, obviously treating a contract as a scrap of paper, I, for one, shall have to lay my machine up till happier times dawn. If there is not enough petrol for the use of the Army and Navy and other necessary services vital to the nation, it is quite right that private users should be restricted, and if it had been necessary for the tax on petrol to be increased by, say, 2s. a gallon to attain that end, it would be just, as no contract is broken. But if this is persisted in I must on August 14th lay the machine up instead of on September 30th. R. E. WINTER.

## Four-cylinder Motor Cycles.

Sir,—May I crave a space to reply to Messrs. Lee and Vowels, and to those of my correspondents who have written privately to me and to whom I have been unable to reply by post?

Let me say, firstly, that the temporary arrangement for operating the F.N. inlet valves mechanically was, like Mr. Brough's sidecar steering, purely a freak conversion for experimental purposes. It achieved its end; but it was not such an apparatus as one would care to have permanently attached to the machine. Further, lest Mr. Vowels be disappointed, I may say that it was a casting from a pattern which would tax the resources of the most capable amateur to turn out satisfactorily. I regret that I do not feel justified in giving details, as the person primarily responsible in making the attachment practicable (Mr. T. Stewart, the Manchester F.N. agent) is deserving of whatever commercial advantage may accrue from his ingenuity should the device later on be patented and placed upon the market in an improved and standardised form.

As to Mr. Vowels's difficulty in picking up at slow speeds on top gear, I think it extremely probable that escape of compression past the piston rings is at the root of the trouble. This might be due to worn rings, distorted pistons, or worn cylinders. What would be negligible in a mechanically-valved single or twin makes some considerable difference to the automatically-valved four-cylinder. The remedy is obvious, but the effect may be minimised by fitting lighter springs on the offending cylinders. It would also be advisable to have the magneto cleaned and dried, and to be absolutely positive that the vacuum pipe nipple does not allow leakage where it joins the silencer.

In reply to Mr. Lee, it is obviously impossible for me in the space at my disposal to detail the alterations made to my old F.N. The machine, apart from the engine, drive, and forks, was rebuilt on typical British lines—sloping frame, broad wedge tank, Best and Lloyd lubricator, gear lever well forward, ultra-low saddle position, etc. To check the side play which develops in the lower front fork links, new links of three times the bearing surface with Stauffer lubricators were cast in phosphor-bronze. As regards power production, the main thing is to have the engine in perfect tune, and the prime essential in tuning an F.N. is to have perfect compression. There must be no leakage at all past the rings. For all-round running the inlet valves should be set to float off their seats at 11½ oz. An absolutely sound engine will

stand springs up to 1½ lb. A well-known aviator always keeps the springs on his F.N. inlet valves at the latter strength, but his compression is his constant care.

In older type models, where the distributor is separate from the magneto, the brasses in the distributor should be true with the vulcanite. If they are rough or uneven the cap should be bored out a trifle. It is absolutely vital that the vacuum pipe should function properly. It should not leak at either of its joints. A vast improvement on the functioning of this pipe results from removing the internal central tube in the silencer, making the latter simply a big hollow box, the only outlet being a direct escape into the short extension pipe, which should be securely fastened into the end of the silencer. The nipple of the vacuum pipe is held in this extension pipe. The increase in noise is negligible. An F.N., otherwise perfect, can be made a spluttering abomination by using an incorrect jet. Most singles and twins show but slight variation in running on jet sizes within a couple of thousandths larger or smaller than the size with which they should be fitted. There is only one correct size for the F.N., and that can only be found by experiment. The standard jet is much too large, especially for the spirit supplied nowadays. For instance, my own machine ran best when the jet was reduced to 22-1,000ths. On the older type carburetter (without the extra air lever) an extra air fitting, such as a compression tap, should be let into the induction pipe. It is a good plan for sidecar work to time the magneto just a shade slower than the makers' setting.

Finally, I can confidently recommend owners of old F.N.'s to have the cylinders bored out to 55 mm. and to have new pistons, etc., fitted. This is not expensive, and it pays for itself in increased pleasure on the road.

H. E. THOMPSON.

#### Simple Improvements.

Sir.—In your issue of May 11th, there are two refinements illustrated in a communication by Capt. A. Lindsay, M.B., showing, on page 441, firstly, an air funnel attached to a Binks carburetter, with a lamp wick to catch the blow-back petrol. In the first sketch will be seen a small air scoop like a half cylinder attached to the B. and B. carburetter. I have used air scoops on my engines for seven years, and find the power and general running better than without them. It has always been a mystery to me why the air inlet to carburetters is almost always placed pointing to the rear or to the side of the machine. If a machine is travelling at twenty miles an hour on a calm day the draught suction on the carburetter intake is dead against the cylinder suction, the result being that the charge (air and petrol) is "wire drawn," and at the end of the suction stroke the charge in the carburetter and induction pipe is drawn back by the air draught, causing a partial vacuum (and loss of petrol) which has again to be filled at the next suction stroke. The air scoop acts as an injector, and gives a denser mixture, at the same time assisting the cylinder suction, and putting less strain on the jet, and consequently less loss in petrol, much of which may be unconsumed. On one machine I had a funnel-shaped scoop, and kept it greased inside, thus arresting a considerable amount of dust and grit.

The other illustration, on page 442, shows a copper cooling device, the advantages of which I can bear out. In my second sketch will be seen two copper fins attached to the sparking plugs, which are screwed down through the fins. In addition to the copper asbestos washers, the fins being next to the cylinder tops. Since using these fins there has

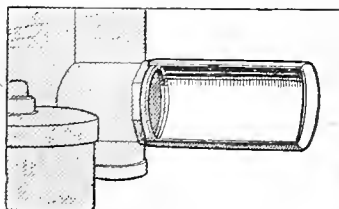


Fig. 1.—Scoop attached to the carburetter to prevent wire-drawing of the charge.



Fig. 2.—Copper flanges to assist in cooling the sparking plug

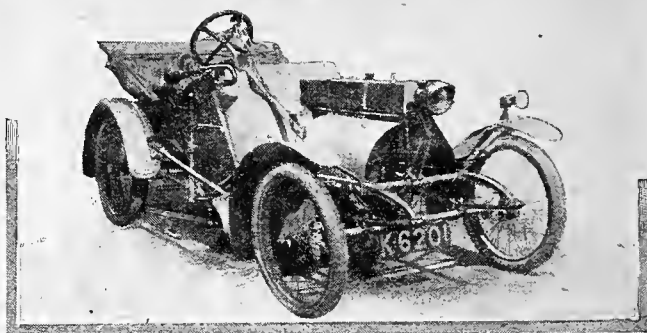


Fig. 3.—Home-built runabout fitted with 8 h.p. J.A.P. engine by Mr. H. Porter.

been an absence of knocking, where at times knocking took place formerly.

The photograph is of an 8 h.p. J.A.P. twin engine fitted to my home-built cycle car, weight about 6 cwt. The petrol consumption, with two up, is from fifty to sixty miles per gallon.

HERBERT PORTER.

#### Two Easily-made and Useful Tools.

Sir,—I enclose two sketches of tools which might be of interest to readers, as they are easily made and very effective. I have a 3½ h.p. twin N.U.T., and the valve springs are rather strong. It is also awkward to handle these with a screwdriver and take out the cotter pins, so I made the tool shown in fig. 1.

A is a piece of flat steel, bent at one end to hang on the pins of the cylinder. Four holes are drilled through which to put the bar B. This is made of ½ in. steel, split at the end, and then flattened. The valve caps require taking out, and a piece of wood put on top of the valve, and the cap screwed down with the fingers. This prevents the valve lifting when raising the spring.

Fig. 2 is a scraper for removing the carbon deposit. A is a piece of tube ¼ in. inside bore. B is a piece of tool or spring steel, ¼ in. diameter, knocked into tube A. The end is flattened out and bent. It is then ground up and hardened. Care should be taken in using this tool to get just at the edge of the carbon deposit, and, pressing the tool on the opposite side, press down. By just drawing the tool across the top of the cylinder the deposit is removed. All the carbon can be removed from a Triumph cylinder and piston in less than ten minutes.

G. WILKINSON.

#### An Inadmissible Theory.

Sir,—I should like the opinion of those who have studied the two-stroke engine in regard to the following theory:

In a two-stroke the exhaust port opens slightly in advance of the transfer passage. At this moment, the expanding charge, seeking the path of least resistance, commences to flow out of the cylinder, being assisted by compression within. When the transfer passage is fully open the exhaust port is open to the atmosphere. The burnt gases, in virtue of their initial expansion, tend to leave the cylinder, and, being of greater density, collect nearest the exhaust port. On the other hand, the incoming charge, being least in density, will rise to the top of the cylinder. The exploded charge falls to the bottom and leaves via the exhaust pipe. Thus, when the piston commences to rise, the burnt gas retained in the cylinder should be of a negligible quantity.

IGNORAMUS.

#### SUMMARY OF CORRESPONDENCE.

"A FEW FRIENDS."—We thank the writers of this letter for bringing the matter in question to our notice.



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy, for ease of reference. Letters containing 'legal' questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Oil Leakage.

**?** My trouble is oil thrown out around the pulley, and after about fifty miles my left leg, the whole machine, and, worst of all, the belt are smothered in lubricant. I had the engine recently overhauled, but still the trouble is worse. Is it due to over-oiling—I give one pumpful every six miles—or is it bearing trouble? There appears to be nothing wrong, such as excessive play, in any bearing.—W.D.S.

We should say that the trouble is likely to be due to the release valve not working properly; it might be as well to fit an extra release valve. Either there is too much crank case compression, or the main bearing on the pulley side is badly worn. A pumpful every six miles is a little too much perhaps; try half a pumpful every five miles. Fitting a felt washer behind the pulley might help matters a little.

### Worn Main Bearings.

**?** I should be glad if you would enable me to discover the cause of excessive wear in the crankshaft bearing (pulley side) of my  $\frac{3}{4}$  h.p. motor cycle. Three times within a year the engine has developed a very pronounced rumbling noise, and each time the inner surface of the outer ring of the bearing was found to be badly worn, and I am at a loss to trace the cause of this. Is the inner ring supposed to be a tight fit for the crankshaft, or should the latter slip through quite freely, and, if so, is there no tendency for the shaft to revolve in the inner ring? What is the best method of removing the timing gear cover screws? These are exceedingly tight, and a screwdriver cannot get a proper hold.—E.M.C.

The excessive wear you speak of must be caused by one or other of the following: Faulty bearings, insufficient lubrication, incorrect alignment of crankshaft, or belt run too tightly. Yes; the bearing should be a tight fit both in the crank case, and also fairly tight on the shaft. The only way to remove these screws is with a screwdriver, which should fit the slot exactly. If the slot in the screw head is worn or burred you should try to improve it by cutting it deeper with a hack-saw or small file. See that the screwdriver is sharp. Tapping it home into the screw slot will help to give a good hold. If the screwdriver cannot then be turned, assistance with a spanner gripping the flattened part of the screwdriver will probably help matters.

### White Metal Bearings.

**?** I have taken down my  $\frac{3}{4}$  h.p. single 1914 model after two years' use on account of a slight engine knock. I find the crank pin badly worn; the bush is in slightly better condition. I have sent away for a new crank pin, and contemplate turning out a new gunmetal bush and filling it partially with white-metal, a bush of this description being, of course, fitted rather tightly till the white-metal takes on a skin. What is the disadvantage of a white-metal big end? It gives satisfaction in cars, and I do not see why white-metal running on hardened steel and properly lubricated should not give at least as good satisfaction as gunmetal on a bicycle. I have always over-lubricated, and yet after 4,000 miles with a sidecar there is from  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. play on the big end, and with the hard bronze bush fitted the hardened steel seems to show signs of wear first. Admitting, of course, that the bushes fitted to motor cycle engines are far too small, white-metal seems to me preferable in many ways. I would be glad of your advice on the matter.—J.I.C.

There is no reason why a white-metal lined bearing should not be quite satisfactory; but we fancy that, owing to the small bearing dimensions and the greater speed at which they work, also the higher temperature and less efficient

lubricating system, you would not get the same results on a motor cycle with white-metal as on cars. We are inclined to think, unless you are anxious to experiment, that it would be more satisfactory for you to rebush your engine with phosphor-bronze. However, if you decide to try the experiment, you should run the white-metal into the bush, having first thoroughly cleaned it. The metal should then be scraped away until the bush exactly fits the crank pin. This is a ticklish job, and requires considerable skill.

### Difficult Starting.

**?** I am running a  $2\frac{3}{4}$  h.p. J.A.P., which gets away from cold quite easily; but at times, after running, it refuses to start up again without a great deal of trouble. It cannot be overheating, because it is just the same after five minutes or two hours. I have run the machine for sixty miles non-stop, and had not the slightest trouble, and yet I am afraid to stop in the middle of a run in case I cannot get started again. Can you suggest any reason for this? The spark is all right, as I can still get a shock off the terminal of the plug.—F.G.F.

Possibly you have too large a jet. Have you tried starting with the air a little way opened, as when the engine is warm the mixture may be too strong with the air fully closed?



### TESTING A MILITARY MOTOR CYCLE ON SALISBURY PLAIN.

If a motor cycle were human we should sympathise with those used for military purposes. Before they actually get to any war zone they are passing from one test to another. The usual manufacturers' test is followed by one made by the military authorities when each machine is handed over to them. This in some cases is followed by a buck-jumping test (!) as shown above.



**Magneto Breakdown.**

Q

My 6 h.p. machine held me up the other day and absolutely refused to start. The trouble was traced to a very weak or absent spark from the magneto. I proceeded to push the machine home, but got it to fire again after coasting down a very steep hill in gear. It continued to fire and carried me home, but has now failed again. My repairers have taken the magneto to pieces, but can make nothing of it, and it has now been sent to London for overhaul. (1.) Can you tell me what is likely to be the trouble? (2.) Would the high-tension wire slipping off the front cylinder plug while the engine was running cause damage to the magneto? This happened, and the spark was so strong that it fired the rubber of a Bowden cable.—R.H.C.

(1.) There are numerous things which happen to a magneto, such as the breaking down of the armature winding, a cracked brush holder, a broken carbon brush, etc. (2.) If the engine were running very fast when the plug terminal fell off this would impose a large strain upon the armature winding, which, however, should be saved by the safety spark gap with which every magneto is provided, though in your case it may have been adjusted with too wide a gap, and so have caused the current to burn the insulation of the armature winding.

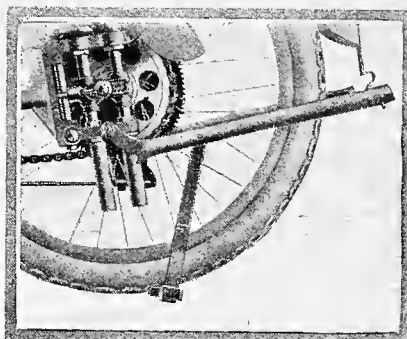
**Variable Jet Carburetter.**

Q

The carburetter fitted to my machine seems to be extravagant in petrol. I have not had the machine long enough yet to know what it should consume or check it as to miles done per gallon. The description is as follows. In place of the jet tube there are two small holes in the bottom. There is a spindle which has a head that is not a true circle, and which can be turned with a small handle under the spraying chamber, so covering and uncovering the two small holes. Please state use of this arrangement. When I bought this cycle I found these two holes fully opened. Would that cause excessive petrol consumption, as it appears to me the diagrams of other carburetters only show one hole in jet? A pipe about 4in. long has been soldered on. Would this be better if it were lengthened out and bent round to face cylinder, so as to draw warm air into mixing chamber instead of cold, and should there be a piece of gauze in this tube?—F.J.

Your carburetter is a variable jet B. and B., the two small holes covered and uncovered by the eccentric disc being the jets. You should always run with these holes as much covered up by the disc as possible to obtain the greatest economy. If you have been running with them wide open, then you would probably be using too much petrol. Yes, draw the air from the warm cylinder in preference, but not if it means fitting a pipe with a very acute

bend in it. A gauze in this air pipe is unnecessary, and unless it is possible to make it so as to cover a very large area it is undesirable.

**A STAND IMPROVEMENT.**

On the latest model Pope the stand has a secondary member. When raising the back wheel on to the stand proper the support is first of all dropped down; foot pressure is then applied to the stand, which, acting as a lever, lifts the rear wheel easily and without any exertion on the driver's part.

**READER'S REPLY.****A Worn Timing Gear.**

Having read of "H.W.'s" troubles re magneto timing, I think this experience of mine may be of some help. Some time ago I took my 6 h.p. Bradbury to pieces for a thorough overhauling. After putting together, timing, etc., I went off for a trial. It started in about five yards. I jumped on. In fifty yards it stopped, and a restart proved impossible. I requisitioned the help of a passer-by. After hard pushing for about sixty yards a loud explosion took place, with fire coming through the silencer and exhaust pipe, behind which my good Samaritan had almost placed himself. For a second he thought his leg was blown off, and went away, refusing all further assistance with such a dangerous affair. I pushed the machine home again, went over the timing, which was all wrong, though I felt certain I had done the work well before. Off again. This time I was more successful. It went up the road, almost round the square, a quarter of a mile in all. I was "shaking hands with myself" when it suddenly stopped, and once again refused to budge. This was certainly funny. Anyway, no amount of coaxing would make it go further, and I had perforce to push the rest of the way home. I retried the timing—all wrong again. The two sprocket wheels were tight, all seemed right, and I was really puzzled. To reset it again and go off was only fooling and wasting time. I took off the magneto, looked at magneto chain driving wheels, and found all correct. Then I took the magneto to pieces, and only on reputting the same together did I find the cause of the trouble. Behind the contact breaker there is, or was, a small pin fitting in a hole on the armature. This had become bent, through

what cause I cannot tell, as the magneto had never been touched. The contact breaker was slipping on the armature, and the timing was thereby badly upset, of course. I put a new pin in, retimed, and my trouble was ended. I do not know if this is an unusual occurrence. I should think and hope it is, but it may also be the cause of "H.W.'s" trouble. Anyway, he can but make certain.—E. TAVERNIER.

**RECOMMENDED ROUTES.****INVERNESS TO ABERDEEN.—J.G.B.**

Inverness, Nairn, Forres, Elgin, Fochabers, Keith, Huntly, Inverurie, Aberdeen.

**MILFORD (SURREY) TO DERBY.—R.S.H.**

Milford, Elstead, Farnham, Odiham, Hook, Reading, Wallingford, Oxford, Banbury, Coventry, Shilton, Three Pots Inn, Atherstone, Twycross, Ashby-de-la-Zouch, Derby.

**ALDERSHOT TO MANCHESTER.—R.S.H.**

Aldershot, Farnborough, Sandhurst, Wokingham, Reading, Wallingford, Oxford, Banbury, Coventry, Shilton, Three Pots Inn, Atherstone, Twycross, Ashby-de-la-Zouch, Derby, Matlock, Bakewell, Buxton, Manchester.

**GOOLE TO WIGAN.—G.H.**

Goole, Selby, Tadcaster, Harewood, Otley, Ilkley, Skipton, Gisburn, Clitheroe, Whalley, Preston, Wigan.

**ABERDEEN TO EDINBURGH.—J.G.B.**

Aberdeen, Stonehaven, Bervie, Montrose, Arbroath, Dundee, Cupar, Falkland Road Station, Kirkcaldy, Burntisland, Granton, Edinburgh.

**GRAYSHOTT TO FOLKESTONE.—G.W.**

Grayshott, Godalming, Shalford, Dorking, Reigate, Westerham, Maidstone, Charing, Ashford, Folkestone. Approximately 100 miles.

**GRAYSHOTT TO WARMINSTER.—G.W.**

Grayshott, Petersfield, Winchester, Stockbridge, Salisbury, Stapleford, Heytesbury, Warminster. Approximately 80 miles.

**NEWCASTLE-UNDER-LYME TO GREENOCK.—C.G.**

Newcastle, Holmes Chapel, Northwich, Warrington, Wigan, Preston, Lancaster, Kendal, Penrith, Carlisle, Gretna Green, Dumfries, Thornhill, Sanquhar, Cummock, Kilmarnock, Irvine, Ardrossan, Fairlie, Largs, Wemyss Bay, Greenock.

**GRETTA GREEN TO INVERNESS.—J.G.B.**

Gretna Green, Ecclefechan, Lockerbie, Beattock, Crawford, Abington, Robertson, Lanark, Carluke, Newmains, Cumbernauld, Denny, Stirling, Dunblane, Perth, Luncarty Station, Dunkeld, Pitlochry, Blair Atholl, Dalnaspald Station, Dalwhinnie, Newtonmore, Kingussie, Aviemore Station, Carrbridge, Daviot, Inverness.

**PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.**

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

## MOTOR CYCLES FOR SALE.

## Alldays.

**ALLONS**—All models from stock; deferred payments arranged.—Lamp's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5990]

**ALLDAYS** Allon, 1915, 2-stroke, 2½ h.p., 2-speed, lamps, speedometer, and accessories, as new; £22/10.—Hill, High St., Oxshott, Surrey. Phone: Oxshott 41. [5956]

**ALLDAYS-ALLON**—All 2-stroke models from actual stock; exchanges arranged. Call or write:—Maude's Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5193]

## Ariel.

**ARIEL**, 3¼ h.p., and sidecar; £22.—Seen 112, New King's Rd., Fulham. [6138]

**ARIEL** 1916 5-6 h.p. Combination, in stock for immediate delivery.—Dan Guy, Weymouth. [5848]

**ARIEL**, all models in stock; easy payments arranged.—Jones, Garage, Broadway, Muswell Hill. [6238]

**ARIEL** 2½ h.p., mag. B. and B., low light, good; bargain, £10.—Thomson, 85, Church Rd., Willesden. [5930]

**ARIEL**, 3½ h.p., Simms, B. and B., Michelin and Dunlop, just re-bushed, perfect order; £18.—Haslett, Garlands, Caterham. [6249]

**COLMORE** Depot, 31, Colmore Row, Birmingham, have in stock for immediate delivery all models of Ariel motor cycles, with or without sidecars. [0797]

**ARIEL**, 2½ h.p., 1915, Bosch waterproof, new Moseley, good Dunlop, grand running order; £9; exchange higher.—Frobisher, 413, Wellington St., Grimsby. [X0966]

**1911** 3½ h.p. Ariel, clutch, new tyre and belt, overhauled, and in perfect condition; fast and powerful; £16, or will exchange for good folding camera and cash.—James Rodway, 149, Merton Rd., Wimbledon. [6147]

**ARIEL**, 3½ h.p., 1912, semi-T.T., fast and flexible, multi gear, free engine, complete, this machine has just been overhauled and re-enamelled and plated by the makers at a cost of £12, and is honestly worth £35; accept £25, very genuine bargain.—Layton's Garage, Bicester, Oxon. [X0995]

## Arno.

**ARNO**, 1912, 3¼ h.p., 3-speed, kick starting, lamps, Bosch, canoe sidecar; £25.—29, St. Leonard's St., Bow, E. [6146]

## Auto-Wheels.

**UTO-WHEEL**, nearly new, great bargain, perfect, £7/10.—Dallyn, P.O., Landkey, Barnstaple. [X0808]

**UTO-WHEEL**, late 1914, in excellent condition; £6/15.—Eagles and Co., High St., Acton, W. [X0941]

**UTO-WHEEL**, unpunctured tyre, spares, seen running by appointment; £7/10.—1, Oak Common Cottages, Heathrow, near Hounslow, Middlesex. [6199]

**THREE** Auto-Wheels, 1914-15 models, little used, otherwise equal to new; £8/10 and £9/10.—Murray's, 37a, Charles St., Hatton Garden, Holborn. [X0958]

## Bat.

**BAT-J.A.P.**, 3½ h.p., like new; first cheque £22 secures.—Gibson, Westminster Rd., Morecambe. [X0908]

**BAT-J.A.P.**, 7-9 h.p., good running order, nearly new tyres, belt, spares, trial here; £20, bargain.—Audsley, Farrier, R.M. College, Camberley. [6162]

**BAT-J.A.P.**, 1914, 6 h.p., Swan 16 in. sidecar, new driving tyre, lamps, horn, speedometer, spare tyre and tube, etc., all grey; owner joining up; 50 gns. O/O Barnes, 308, Upper Richmond Rd., East Sheen, Surrey. [6086]

**BAT-J.A.P.**, 8 h.p., late 1912, 2-speed, spring frame, coachbuilt sidecar, with large car lamp on sidecar, P. and H. head lamp, generator, horn, mirror, 2 spare valves, etc.; £34; exchanges.—Ideal Cycle Co., Thundersley, Essex. [6151]

**BAT** Cycle, 6 h.p., twin cryls, special model No. 2 C., 1915 model, painted grey, Bosch ignition, countershaft gear, with 3 speeds, complete with Lucas head and tail lamps, tyres 26x2½, spring footboard, Lucas horn, spare box, bolts, and nuts, also spare chain parts, tools, pump.—Can be seen at Barkston Motor Co., 244, Earl's Court Rd., London, S.W. Price asked £75. [5998]

## Bradbury.

**BRADBURY**, 1911, good order; £16.—K. Arnsley, Blurton House, near Longton, Staffs. [X0825]

**BRADBURY**, 2½ h.p., mag. B. and B.; £9/10.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [5628]

**BRADBURY**, 1913, 4 h.p., chain drive, 2 speeds, clutch, cane sidecar; £26.—672, Commercial Rd., London, E. [X0903]

**BRADBURY**, 1913, 3½ h.p., all accessories, good condition; owner at Front.—Plumb, 25, Brougham Rd., Acton, W. [X0853]

**BRADBURY**, 1913, 4 h.p., free engine, N.S.U. 2-speed, Bosch dustproof mag., Sensap carburettor, splendid condition; bargain, £25.—42, Clifton Rd., Old Kent Rd. Station. [5975]

**BRADBURY** 4 h.p. Combination, countershaft gear, chain-cum-belt, with high-grade coachbuilt sidecar, in perfect condition throughout; lowest 39 gns.—Egbert Spearman, Bishop's Stortford. [5608]

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## CASH OFFERS WANTED.

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1916 7-9 h.p. HARLEY-DAVIDSON ..... £80 15  
1916 ditto, electrical model ..... £89 0  
7-9 h.p. INDIAN, 1915, electric model, with Millford £18 18s. Sidecar, screen ..... £75 0  
8 h.p. ZENITH, 1913, Zenith gear ..... £29 15  
2½ h.p. WOLF, 1916, 2-stroke, 2-speed ..... £33 10  
A.C. Sociable, 1912, hood, screen, 3 brass lamps ..... £39 15  
6 h.p. REX, 1912, 2-speed model ..... £25 0  
2½ h.p. TYLER, 1915, 2-speed model ..... £24 15  
2 h.p. TRIUMPH, 1910 model ..... £18 15  
3 h.p. LINCOLN-ELK, 1912 model ..... £13 15  
5 h.p. INDIAN, 1915, 3-speed, finished red, beautiful condition ..... £57 15  
4 h.p. ZENITH, 1912, variable gear ..... £25 0  
1913 HUMBERETTE, 8 h.p., hood, screen, 5 lamps, and speed wants attention ..... £39 0  
3½ h.p. RUDGE, 1912, free-engine model ..... £19 15  
3½ h.p. P. & M., 1909, 2-speed, chain drive, with Sidecar ..... £19 15  
5 h.p. twin REX, magneto, 2 sp., handle starting, spring forks ..... £13 15  
3 h.p. LINCOLN-ELK, 1911, magneto ..... £11 15  
2½ h.p. TRIUMPH, 1911, 2-speed model, with Sidecar, lamps, and horn ..... £23 15  
2½ h.p. PREMIER, 1912, 3-speed model ..... £20 15  
1915 MORGAN, 700x80 tyres all wheels, lamps, horn, hood, screen, speedometer, etc. .... £79 0  
3½ h.p. HUMBER, 1911, 2 speed ..... £17 15  
3½ h.p. P. & M., 1912, kick starter ..... £27 15  
3½ h.p. PREMIER, 1911, B.S.A. 2-speed ..... £19 15  
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## MOTOR CYCLES FOR SALE.

## Brough.

**BROUGH**, 1915, 3½ h.p. twin, countershaft 2-speed, perfect condition, Lucas lamp, horn; lowest £40.—L1,470, c/o The Motor Cycle. [5952]

## Brown.

**BROWN**, 3¼ h.p., T.T., Bosch, B. and B., fast; £12.—Troward, Heathurst, Vale of Health, Hampstead. [6104]

**BROWN**, 3¼ h.p., and sidecar, 2-speed, in good order; £25; easy payments arranged.—Jones, Garage, Broadway, Muswell Hill. [6239]

**BROWN**, 5 h.p., and sidecar, new 1912, free engine, 650 tyres, splendid condition, comfortable; cheap; £35.—Baker, 25, Grange Rd., Cannonbury. [5963]

**3½ h.p.** Magneto Brown, T.T. bars, dropped frame and tank, spring forks, just re-enamelled and thoroughly overhauled, perfect; 16 gns.—Box L1,488, c/o The Motor Cycle. [6255]

## B.S.A.

**B.S.A.**, new 1916 models H and K actually here waiting.—Moss, Wem. [X0993]

**1912½ B.S.A.**, 2-speed, free engine; £50.—Looe, Dentist, Enniskillen. [5947]

**COLMORE** Depot, 261, Deansgate, Manchester, for immediate delivery of B.S.A. [0798]

**B.S.A.**, 1916 models H and K, in stock; immediate delivery.—Grassby, Barton-on-Humber. [X0867]

**B.S.A.** Models H and K in stock; immediate delivery.—Colmore Depot, 261, Deansgate, Manchester. [6024]

**B.S.A.**, 1916, brand new, guarantee given, best Lucas booter; accept £59.—Box 483, c/o The Motor Cycle. [X0995]

**1915 4½ h.p. B.S.A.** model K, equal new, complete with lamp, horn, etc.; £45.—Thos. Booth, Finsbury, London. [6141]

**B.S.A.** 1915 Combination, cost £85, sell £55; consider lightweight part.—35, Richmond Rd., Kingston, Surrey. [6047]

**B.S.A.**—Immediate deliveries from stock of model H machines, £64.—Grosvenor Garage, Bradford St., West, Bolton. [X0886]

**COLMORE** Depot, 44, Finsbury Pavement, have all models B.S.A. and sidecars in stock. Easy payments arranged. [5840]

**B.S.A.**, 1912, 3½ h.p., fast, powerful machine, good condition, new tyre back; £21, or nearest.—Beck, 9, Hedon Rd., Hull. [X0868]

**B.S.A.**, 1913, 3½ h.p., free-engine clutch, pedal start; £29/10. Good combination wanted.—Newham, 223, Hammersmith Rd., W. [6091]

**B.S.A.**, 4½ h.p., chain drive, 3-speed, condition as new, Lucas fittings, very low mileage; £43/10 cash.—Axon, Holesley, Solop. [X0891]

**B.S.A.**, new models.—I have a good stock of model H's and No. 2 sidecars; no waiting.—Hucklebridge, 133, Sloane St., London, S.W. [X0436]

**B.S.A.**, 1915, 4 h.p., chain-cum-belt, 3-speed, complete; accept £45, worth quite £50, cash only.—Layton's Garage, Bicester, Oxon. [X0997]

**1915 B.S.A.**, 4½ h.p., model H, 3 speeds, chain drive, new condition, ridden 1,500 miles; £47/10.—Hucklebridge, 133, Sloane St., London, S.W. [X0957]

**1915 4½ h.p. B.S.A.**, 3 speeds, Palmer tyres, excellent order, with coachbuilt sidecar; £60.—The Barnes Motor Garage, opposite Red Lion, Barnes, S.W. [6030]

**B.S.A.**, 4 h.p., 3-speed, 1914½, done only 3,000 miles, careful rider, complete with 16 gn. Empire sidecar; £48.—Hazelwood, 111, Selby Park Rd., Birmmham. [X0842]

**B.S.A.**, 1914, 3-speed countershaft, clutch, kick start, 1915 B.S.A. sidecar, in excellent condition, Lucas lamp, horn; £49.—Lieut. Porter, Egypt Point, Newham. [X0556]

**B.S.A.**, 4½ h.p., 1916 K models in stock, chain-cum-belt, 3-speed, kick starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton, London. [X0940]

**B.S.A.**, 1916, 4½ h.p., models H and K; £62; exchange stock; exchanges arranged.—Maude's Motor Mart, 100 and 136, Gt. Portland St., London, W. Phone: 552 Mayfair. [5184]

**B.S.A.**, 1916, model K, 4 h.p., chain-cum-belt, countershaft 3-speed, used once, guaranteed unsold and perfect; cost £62, must sell because of serious illness, accept £55; will transfer warranty.—Tollady, Henningford, Bicester, Oxon. [X0998]

**B.S.A.**, 1916.—We can deliver the famous model K from stock, the finest 4 h.p. 3-speed countershaft machine on the market; price £62; exceptional exchange quotations, extended payment propositions of any reasonable character entertained. We are B.S.A. specialists, and our mechanics test and tune every machine before delivery.—Layton's Garage, Bicester, Oxon. Phone: 35. [X0996]

## Campion.

**CAMPION**, 3 h.p. twin N.S.U. engine, Bosch, good tyres, excellent condition throughout; £15.—Alderman, Bridge House, Thorney, Peterborough. [X0564]

**CAMPION-VILLIERS**, 1915, 2½ h.p., exceedingly fine condition, overhauled, and guaranteed, bump, horn; £22/10, genuine bargain.—Layton's Garage, Bicester, Oxon. [X1001]

## MOTOR CYCLES FOR SALE.

## Calcott.

1913 Calcott, 2½ h.p., good running order, appearance as new, good tyres; £14, bargain.—Knowles, Barton, Canatforth. [X0560]

## Calthorpe.

CALTHORPE Junior, Precision, 1914, 2 speeds, good as new; £16.—123, Bulwer Rd., Edmonton, N. [5910]

1914 Calthorpe Junior, 2½ h.p. Precision, 2-speed, good condition; £16.—Edwards, Dawes St., Bolton. [5984]

CALTHORPE J.A.P., 2½ h.p., 1915, Enfield 2-speed, lamps, horn; £24.—Lawrance, 97, Princess Av., Watford. [6212]

COLMORE Depot, 44, Finsbury Pavement, have all models Calthorpe in stock. Easy payments arranged. [5841]

CALTHORPE, 2½ h.p., 2 speeds, unpunctured, not done 800 miles; £18.—15, Arncliffe Rd., Headingly, Leeds. [6122]

CALTHORPE J.A.P., 2½ h.p., late 1915 machine, 2-speed Enfield gear; £30.—Colmore Depot, 31, Colmore Row, Birmingham. [X0920]

CALTHORPE Junior, 2-speed, only done 1,200 miles, absolutely as new; a bargain, £19/10.—Ebert Spearman, Bishop's Stortford. [5607]

CALTHORPE J.A.P.—Three models in stock; deferred payments arranged.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5987]

COLMORE Depot, 31, Colmore Row, Birmingham, have in stock all models of Calthorpes for immediate delivery; also at our Manchester Depot. [0799]

1914 Calthorpe Lightweight, 2-speed, perfect condition and running order; bargain, £15, first cheque secures.—Newham, 223, Hammersmith Rd., W. [6093]

CALTHORPE, 2½ h.p. J.A.P., with Enfield 2-speed gear, brand new, shop-soiled only; list £36/15, accept £35.—P. J. Evans, John Bright St., Birmingham. [X1027]

CALTHORPE J.A.P., 2½ h.p., 1915, 2-speed, T.T. bars, speedometer, very fast, splendid order; £28.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

CALTHORPE Motor Cycles, 1916 models.—Just arrived: 2-stroke 2-speed 31 gns., J.A.P. 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [0777]

CALTHORPE latest 1916 2-speed models in stock; cash or exchange; no waiting. Also a few brand new 1915 models, slightly soiled, at reduced prices.—Eagles and Co., High St., Acton, London. [X0938]

4 h.p. Twin Calthorpe Combination, 1916, new, J.A.P. engine, Enfield 2-speed gear, chain drive, handle starting, coachbuilt sidecar; cost with accessories £75; must sell; accept £68.—Myrtle Cottage, Ormerod Rd., Burnley. [X0890]

CALTHORPES, all 1916 models, ex actual stock, including the new 4 h.p. combination at 67 gns. Write or call for lists. Exchanges.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5192]

CALTHORPES, new 1916 models, 2½ h.p. J.A.P. engine, 2-speed Enfield gear, £37/16; 2-stroke models, 2-speed, £28/17/6; 2½ h.p. single speed models, £32; also the sidecar combination, fitted with twin-cyl. 4.5 h.p. J.A.P. engine, 2-speed gear, handsome light coachbuilt sidecar, the combination 67 gns.; exchanges or easy terms arranged.—Vauchopes', 8, Shoe Lane, London. [6190]

## Chater-Lea.

CHATER-LEA, 1914, 8 h.p., Royal Leicester C.B. sidecar, 3-speed gear, clutch, handle start, lamps, etc., good tyres; £60.—Apply, Shepherd, Lower Rd., Rotherhithe. [6154]

## Clement.

1½ h.p. Clement, mag., low frame, in good condition; £4 cheap, £7 10.—Buckley, Sunderland St., Macclesfield. [6089]

## Clyno.

1910 Clyno, 6 h.p., with wicker sidecar, 2-speed, kick starter, chain drive, good condition; £26.—Hall, The Cottage, Waterhouses, Ashbourne. [X0962]

CLYNO 1914 Combination, spare wheel, dynamo lighting equipment, equipped regardless, perfect condition; £65.—106, St. Paul's Rd., Highbury. [6066]

CLYNO, late 1913, 3-speed, fine condition, 1915 Clyno sidecar, hood, screen, spares, etc.; £50, or near; trial.—F. Park Garage, Greentford Av., Hanwell. [6035]

CLYNO, 6 h.p., 2 speeds, kick starter, 1916 coachbuilt sidecar, new tyres, splendid condition, accessories; trial; 35 gns.—46, Marnham Rd., Clapham Common, S.W. [6154]

## Connaught.

CONNAUGHT, latest T.T. model; immediate; £36/17.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [5631]

CONNAUGHTS in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £28/17 6.—P. J. Evans, John Bright St., Birmingham. [X1025]

## Corah.

6 h.p. Corah-Jar, Jardine 4-speed, all accessories, Turner coachbuilt sidecar, hood, screen; £50.—180, Turners Hill, Chessant, Herts. [5852]

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## HARLEY-DAVIDSON SIDECAR COMBINATIONS.

The machines are brand new—standard specification and standard equipment—and carry 12 months' full guarantee. The Sidecars are made specially for us by The Gloria Co., Coventry, and we offer you the finest outfit on the road at

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Model F, 7-9 h.p., 3-speed, with "GLORIA" special H.D. 1A Sidecar, enamelled throughout H.D. grey, 28 x 3 in. Dunlop tyre, special 4-point attachments, luxuriously upholstered and sprung. Price, complete

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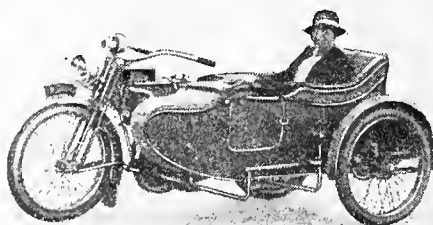
Model J, 7-9 h.p., 3-speed, with Dynamo Electric Lighting Outfit, Head Lamp, Tail Lamp, Electric Horn, etc.—fitted with special H.D. 1A, "GLORIA" Sidecar (as above). Price, complete ...

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Model J, 7-9 h.p., 3-speed (as above), but fitted with special H.D. No. 3 "GLORIA" Sidecar, with Patent Spring Wheel, and many other exclusive refinements. Price, complete ..

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## MOTOR CYCLES FOR SALE.

## De Dion.

DE DION, 3 h.p., U.H. mag., B. and B., spring forks, splendid order throughout; bargain, £28/15.—Speckley, 45, Church Rd., Acton. [X0934]

## Douglas.

COLMORE Depot London Agency for immediate delivery of Douglas latest models. [5843]

DOUGLAS, 1910, fine condition, good tyres; £15.—20, Denison Rd., Brentnham, Ealing. [X0884]

1911 2½ h.p. Douglas, T.T., very fast, little used; £18.—Ward, Oakroyd, Potters Bar. [6054]

DOUGLAS, 4 h.p., 3-speed, Douglas sidecar, 1915, fully equipped; £55.—Dan Guy, Weymouth. [5849]

DOUGLAS, 1914, 2 speeds, lamps, etc., unscratched; £34.—11, Luna Rd., Thornton Heath Clock, S.E. [5916]

£24.—Douglas, 1912, 1914 improvements, new condition, accessories.—15, Parsons Heath, Colchester. [6037]

DOUGLAS, 2½ h.p., good tyres and good running order, £14, offer.—385, York Rd., Wandsworth. [6075]

DOUGLAS, 1911, overhauled, re-bushed, very economical; £17.—Mansell, St. James's Av., Farnham. [6132]

1909 Douglas, in good order; bargain, new tyres, £12.—Jones, Garage, Broadway, Muswell Hill. [6240]

DOUGLAS, 2½ h.p., smart machine; £25; exchange 3½ h.p.—Stanley, 30, Canterbury Rd., Kilburn. [6222]

1911 2-speed Douglas, thoroughly overhauled, new Binks; £18/10.—Stocks, Thurlstone, Sheffield. [X0894]

1915 4 h.p. Douglas, 3-speed, clutch, splendid condition; £50.—Smith, 13, St. Andrew's Crescent, Cardiff. [X0892]

DOUGLAS, 1914, perfect condition, model W; £38.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [5632]

DOUGLAS, 1914, T.T., all accessories, new Dunlop, perfect condition; £36.—Svanso, 4, Fennel St., Manchester. [X0944]

DOUGLAS, late 1914, 2½ h.p., lamps, speedometer, horn, spare belt; £38.—W., 58, St. George's Rd., Peckham, S.E. [6049]

DOUGLAS, 2½ h.p., 1914, T.T., 2-speed, speedometer, lamps, horn, new condition; £37.—51, Ritchings Av., Walthamstow. [6183]

DOUGLAS, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas.—Mofat, Yeovil. Tel.: 50. [5855]

DOUGLAS, 1914, 2½ h.p., 2 speeds, lamps, horn, speedometer; £35, or offer.—Harris, 310, Richmond Rd., Twickenham. [5948]

DOUGLAS, 1913, 2½ h.p., 2 speeds, and clutch, also light sidecar; £33/10.—Colmore Depot, 31, Colmore Row, Birmingham. [X0913]

1916 New Douglas, 2½ h.p. T.T. model, immediate delivery from stock.—R. Bamber and Co., Ltd., 53, Liverpool Rd., Southport. [6219]

DOUGLAS, 2½ h.p., 1913, perfect condition, just overhauled; owner at Front; bargain, £25.—82, Blackhorse Lane, Walthamstow. [X0900]

DOUGLAS, 2½ h.p., Oct., 1915, 3 months ridden, owner at Front; all accessories; £45, no offers.—Apply, 135, Walton Rd., Aylesbury. [X0783]

DOUGLAS, 2½ h.p., 2-speed, 1914, not done 1,000 as new; £34, lowest; consider 2-stroke and cash.—35, Richmond Rd., Kingston, Surrey. [6046]

DOUGLAS Specialists.—Gibb, Gough, London Rd., Gloucester. Gibb, the International Douglas rider, winner of numerous cups and gold medals. [1189]

1914 4 h.p. Douglas, 2 speeds, disc wheels, excellent order, with or without sidecar; bargain.—The Barnes Motor Garage, opposite Red Lion, Barnes, S.W. [6029]

BARGAIN.—1910 Douglas, fast, economical, just overhauled, requires tuning, grand engine, lamps, horn, tools; first cheque £12/10 secures.—Cameron, Tickhill. [6010]

LATE 1912 2½ h.p. Douglas, 2-speed, free, excellent order, nearly new tyres, all accessories; good bargain, £28.—Engineer, Pinewood Sanatorium, Wokingham, Berks. [X0559]

DOUGLAS, Oct., 1913, T.T., stored since the outbreak of war, in new condition, all lamps and spares; £37/10.—Oram, 29, Caddington Rd., Cricklewood, London. [5733]

COLMORE Depot, Birmingham, Manchester, Leicester, and Liverpool, have in stock complete range of all models Douglas for immediate delivery, also full range of spares. [0800]

DOUGLAS (1910), 2 speeds, Binks carburetter, F.R.S. lamp, horn, tools, spares, new back tyre, good running order; price £17/10.—Hunts, Ltd., 117, Long Acre, London, W.C. [X0772]

DOUGLAS, 1912, 2-speed, clutch, kick starter, Cowey speedometer, P. and H. lamp, dry battery rear light, X'all pan seat, spare tyre and belt; £26, no offers.—18, Ship St., Cubitt Town, Is. [6051]

1915 2½ h.p. Douglas, model U, 2-speed, footboards upturned or semi-T.T. bars, 2 lamps, horn speedometer, under 2,000 miles; £46/10.—Robinson's Garage, Green St., Cambridge. [6118]

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**REY'S**  
SOLE LONDON AGENTS  
INSPECT FOR OUR STOCK

New Imperial and Lincoln  
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#### New Machines in Stock.

Model H B.S.A.	£64 0
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1915 3-speed HARLEY-DAVIDSON	£68 5
NEW IMPERIAL J.A.P.	2½ h.p., 2-sp., kick start, and clutch £44 8
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Popular LEVIS	£32 0
ENFIELD Combination	£89 5
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#### Second-hand Bargains.

1914 RUDGE	5-6 h.p., 3-speed £45 0
1914 A.J.S.	5-6 h.p., 3-sp. Combination £70 0
1914 INDIAN	Com., 7-9 h.p., 2-speed £55 0
1915 3-speed HARLEY-DAVIDSON	£55 0
1914 3-speed CLYNO and coach Sidecar	£60 0
1915 NEW IMPERIAL	£32 10
1915 2-stroke 2-speed VELOCETTE	£26 0
1915 MATCHLESS	3½ h.p., twin, overhead valves, 3-speed £35 0
1910 B.S.A.	3½ h.p. £15 0
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2½ h.p. HUMBER	twin, 3-speed £22 0
1913 BAT	5-6 h.p., and Sidecar £40 0

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1914 SINGER	dynamo lighting £175
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1913 MORRIS-OXFORD	£135
1914 CALTHORPE Coupé	£165
1915 MORGAN, W.C. M.A.G.	£110
1914 HUMBERETTE	£90
1914 STANDARD	£180
1915 HILLMAN Delivery Van	£170
1914 HILLMAN	£160

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#### MOTOR CYCLES FOR SALE.

##### Douglas.

DOUGLAS.—We have usually in stock second-hand Douglas from 1911 to 1915; prices £20 to £47. Write for list, or better call.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5186]

DOUGLAS Motor Bicycles.—2½ h.p. models. We have one or two brand new latest pattern machines in stock for immediate delivery. The number is very limited, and further supplies are almost impossible to obtain. We therefore suggest you order from us at once and obtain instant delivery.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. 'Grams: Bicycles. [6113]

##### Elswick.

3½ h.p. 1915 Elswick, 3-speed gear, Bosch mag., practically new; £32.—1, Prebend Gardeas, Chislewick. W. [6070]

##### Enfield.

ENFIELD, 1916, 4 h.p., mag.; cost £62, as new, £45.—Digby, Mersea, Essex. [5997]

ENFIELD New 1916 Combination in stock waiting; enquiries invited.—Moss, Wem. [X0922]

COLMORE Depot, 31, Colmore Row, Birmingham, for immediate delivery of Enfields. [0801]

ENFIELD, 2½ h.p. twin, in thorough going order; 217.—Worsfold, King's Rd., Blandford. [5980]

ENFIELDS, 1916 models in stock, standard and De Luxe, 3 h.p. twin.—Parker, Bradshawgate, Bolton. [X0955]

ENFIELD 1911 2½ h.p. Twin, new Avon and belt, 12 and H., fine condition; £12.—78, High St., Tonbridge. [5943]

ENFIELD 2½ h.p. Twin, first-class condition throughout; bargain, £13/13.—Egbert Spearman, Bishop's Stortford. [5605]

ENFIELD Combination, 1915, standard turn-out, hardly used; £67.—11, Luna Rd., Thornton Heath Clock, S.E. [5915]

ENFIELD Combination, 6 h.p., 1915, Lucas electric lighting set; £70.—Fir Cottage, Kelsey Park, Beckenham. [5922]

ENFIELD 6 h.p. Combination, new, latest 1916 model, actually in stock; price 85 gas.—The Morris Garages, Oxford. [0811]

1915 3 h.p. Enfield Twin, 2-speed, kick starter, splendid condition, lamps, etc.; £35.—47, South-Lambeth Rd., S.W. [X0818]

ROYAL Enfield 1912 Combination, excellent condition, and very fast; price £40.—76, Church St., Camberwell, S.E. [5999]

ENFIELD 6 h.p. Combination, complete, purchased March, 1916, done under 500; 75 gas.—280, Camberwell Rd., S.E. [6060]

ROYAL Enfield, 2½ h.p. twin, and all-chain countershaft drive; £20.—Colmore Depot, 31, Colmore Row, Birmingham. [X0925]

ROYAL Enfield Combination for sale, 1913, 6 h.p., splendid condition; £45.—King, 510, Whippendell Rd., Watford, Herts. [6083]

ENFIELD, 1915, 3 h.p., speedometer, in good condition; £40, or near offer.—Seen at Salmon's, High St. Garage, Guildford. [X0809]

1916 3 h.p. Enfield Twin, practically new, extras included; £50.—The Baroes Motor Garage, opposite Red Lion, Barnes, S.W. [6031]

1913 Enfield, 2½ h.p., 2 speeds, property of officer now in France; £30, or offer.—Yates, 58, Sandringham Rd., Golders Green. [6247]

ENFIELD 1913 Combination, 6 h.p., 2-speed, lamps, horn, accessories, just overhauled, tyres like new; £45.—14, Lysways St., Walsall. [6137]

ENFIELD, late 1914, 6 h.p. C.B. combination, lamps, speedometer, horn, excellent condition; £60.—W. 58, St. George's Rd., Peckham, S.E. [6048]

ENFIELD Combination, late 1915, private use only, perfect condition, speedometer, and all accessories; £70 cash.—Box 475, c/o The Motor Cycle. [X0756]

ENFIELDS, 6 and 8 h.p., delivered from stock; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5989]

ENFIELD 1914 6 h.p. Combination, in excellent condition, screen, speedometer, lamps, etc.; £60.—Jedder, 54, Empress Av., Wanstead Park, N.E. [X0902]

3 h.p. Twin Enfield, 2 speeds, fine condition, not done 400 miles, new September, 1915, lamps, horn, etc.; expert allowed; £40.—J. Hagne, Foulridge, Lancs. [X0548]

1915 Enfield, 2-stroke, 2-speed, almost new, not done 500 miles; a bargain, £34; easy payments arranged.—Jones, Garage, Broadway, Manswell Hill. [6241]

ENFIELDS actually in stock for immediate delivery, 6 h.p. combinations, 3 h.p. and 2½ h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [X1026]

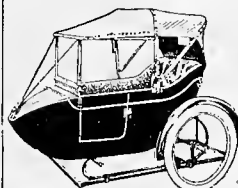
1914 6 h.p. Enfield Combination, coachbuilt sidecar, luggage grid, horn, 3 lamps, tyres nearly new, just overhauled, excellent condition throughout; price £60.—Whiting, Kingsdown, Sevenoaks. [5673]

ENFIELD 1915 3 h.p. Twin, kick starter, lamps, horn, full tools, run under 1,500, excellent all-round condition, low petrol consumption; £43, no offers.—Lieut. Hope Gill, The Castle, Monmouth. [X9573]

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Farlow Sidecars have that pleasing style, exquisite finish, and lasting qualities which are the buyers' ideal.



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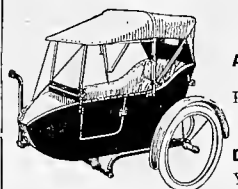
Underlung Chassis, with Luggage Carrier combined.

Splendidly made and built for hard work.

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Hood ..... £2 4

Screen ..... £1 0



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Your Agent will supply

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1916 4 h.p. A.J.S. Combination, interchangeable wheels	90 gns.
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1916 6 h.p. ENFIELD Combination	85 gns.
1916 8 h.p. ENFIELD Combination	87 gns.
1916 6 h.p. J.H. Combination	90 gns.
1916 6 h.p. NEW HUDSON	72 gns.
1916 6 h.p. NEW HUDSON Combination	88 gns.
1916 2½ h.p. NEW HUDSON, 2-sp., 2-stroke	£38 0
1916 2½ h.p. OMEGA J.A.P., 2-speed	38 gns.
1916 2½ h.p. OMEGA, 2-stroke, 2-speed	38 gns.
1916 5-6 h.p. British EXCELSIOR, Sturmer countershaft 3-speed gear	68 gns.
1916 4½ h.p. British EXCELSIOR, Sturmer countershaft 3-speed gear	64 gns.
1916 FORD Touring Car, 20 h.p.	£135 0
1916 FORD Chassis, 20 h.p.	£115 0
1916 FORD Van, 20 h.p.	£130 0
1916 20 h.p. FORD Ambulance	£135 0
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on	£120 0

#### CASH OFFERS WANTED.

4 h.p. BRADBURY, 2 speeds, and sporting Sidecar	£20 0
1½ h.p. HUMBER, 2 speeds, fine goer	£20 0
4 h.p. BRADBURY, single gear, and Sidecar	£15 0
1914 6 h.p. ENFIELD Combination, two horns, lamps, etc., very smart	£62 0
1913 SCOTT, lamp, speedometer, etc.	£30 0
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1915 WOLF, lightweight, 3-speed	£25 0
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3½ h.p. 1909 REX de Luxe, 2-speed, handle starting	£19 0
1913 FORD, English body, Bosch magneto, disc wheels	£84 0



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Fully Guaranteed.

25/- each.

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Nice Coach-built Sidecar	£4 0
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F.R.S. Lamp Set, 1,000 beam, shop-soiled	45/-
New Clincher Clearance Covers, de Luxe, "heavy," rubber-studded, 26x2½, 26x2½, 26x2½, and 26x2½x2½	each £1 0

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**ENFIELD** 1916 Combinations.—We have them in stock; cash price £89/5. Exceptional exchange quotations; extended payment propositions of any reasonable character entertained.—Layton's Garage, Bicester, Oxon. [X1000]

**ENFIELD** Sidecar, 1914, 3 h.p., twin, countershaft 2-speed, chain drive, 26x24 heavy Dunlop R.S. tyres, Burbury lightweight coachbuilt sporting sidecar, Lucas lamp, horn, and tail lamp, appearance and mechanical condition as new, a very good combination, economical to run; £35.—The Premier Motor Co., Aston Rd., Birmingham. [6230]

## Excelsior.

**1915** American Excelsior Combination, 3-speed gear, dynamo lighting; £58.—Ajello, 35, Chestow Crescent, Bayswater, W. [X0949]

**EXCELSIOR** 6 h.p. Combination, practically new, 3-speed, clutch, in perfect order and condition, every accessory fitted; £45.—14, Dodbrooke Rd., West Norwood. [6181]

## Fafnir.

**FAFNIR**, 3 h.p., B. and B., new tyre and tube, splendid order, run perfectly on paraffin; owner enlisted; £7/10.—20, Chapel Rd., Colchester. [5980]

**MOTOR** Cycle, Fafnir, 3½ h.p., and sidecar, 2-speed, free engine, in very good condition; trial; just overhauled; £25.—Parvin, Builder, Mill Hill. [5685]

**3½ h.p.** Fafnir Engine Motor Cycle, fitted with coach-built sidecar, any severe trial allowed; £15; guaranteed.—Wanchopes', 9, Shoe Lane, London. [6193]

## F.N.

**F.N.**, 4-cyl., 1912, perfect order, fast machine; £20, or nearest offer.—Bodman, c/o F.N., Kimberley Rd., Willesden Lane. [6064]

**F.N.**, 4-cyl., shaft drive, 2-speed, hand clutch; seen running; bargain; £15; exchanges.—A. Speechley, 45, Church Rd., Acton. [X0935]

**F.N.**, 4-cyl., 2-speed, sidecar, splendid condition, tools, numerous spares, accessories; £40.—48, Craven Gardens, Wembleton. [6215]

**F.N.** 1912-13 Lightweight, 2-speed, F.E., B. and B. carburettor, Bosch mag., lamps, etc.; £15.—Benge, Engineer, 83, Dudley Rd., Eastbourne. [5944]

**F.N.**, 2½ h.p., 2-speed, clutch, shaft drive, as on car, spring forks, perfect running order, full accessories; £20.—14, Dodbrooke Rd., West Norwood. [6179]

## Grandex.

**1915-16** Grandex-Precision, 6-8 h.p., Enfield 2-speed, luxurious coachbuilt combination, every conceivable accessory, including Cowey, mechanical horn, hood, screen, extra paraffin attachment, etc.; cost £110; under 2,500 miles; sacrifice £55.—Osborne, Romney Lodge, 177, New Park Rd., Brixton. [6143]

## Harley-Davidson.

**BRAND** New Harley-Davidsons.—See below.

**MODEL F.** 7-9 h.p., 3-speed; £68.—The Premier Motor Co.

**MODEL J.** 7-9 h.p., 3-speed, with dynamo electric lighting outfit; £75.—The Premier Motor Co.

**THE** Above are guaranteed brand new; standard specification and standard equipment.—The Premier Motor Co., Birmingham.

**SPECIAL** Gloria Sidecars, to match; 19 and 25 gns. You save £17 by purchasing your new combination direct from the recognised H.D. experts. Delivery carriage paid to any address.—The Premier Motor Co., Aston Rd., Birmingham. [4467]

**7-9 h.p.** Harley-Davidson, only used 3 months; £56.—Parker and Son, St. Ives, Hunts. [6217]

**HARLEY-DAVIDSON**, 1916 models; immediate delivery from stock.—Colmore Depot, 261, Deansgate, Manchester. [6027]

**1915** 4½ h.p. Harley-Davidson, only run 2,079 miles, speedometer, lamps, unscratched; £41.—Crow Bros., Guildford. [5092]

**COLMORE** Depot, Birmingham, Manchester, Liverpool, Leicester, for immediate delivery of all models of Harley-Davidsons and spare parts. [X0802]

**1915** 7-9 h.p. Harley-Davidson, fitted with Montgomery sidecar, and all accessories; cost over £90; must sell; accept 55 gns.—30, Talbot St., Burnley. [X0889]

**HARLEY-DAVIDSON** Combination, Oct., 1915, lamps, mechanical horn, speedometer; nearest offer £70.—Champion, 8, Holmwood Gardens, Brixton Hill. [X0879]

**HARLEY-DAVIDSON**, 1915, 7-9 h.p., 3-speed, model 11F, in practically new condition; £55; bargain.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

**HARLEY-DAVIDSON** 11J, Coronet sidecar, new July, 1915, complete electrical equipment, perfect condition; owner enlisted; £70.—Bailey, 19, Creighton Av., Muswell Hill. [5994]

**HARLEY-DAVIDSON**, 16F, and 16J, with or without sidecars, actually here. We guarantee you good service at Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5992]

**HARLEY-DAVIDSON**, T.T. model, bought April, 1916, extremely fast machine, indistinguishable from new; listed £74; owner re-joining regiment; £60.—Lt. Kennedy, Bacombe, Wendover, Bucks. [5959]

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## A POWER-PLUS INDIAN.

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**Model F.** 7 h.p. Powerplus, 3-speed, kick starter, electrically equipped, with de luxe coach-built Sidecar, complete .... £112 1  
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**Model B.** 5 h.p., 3-speed, kick starter, with No. 1 coach-built Sidecar ..... £88 10  
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**Model H.** 4½ h.p., 3-speed countershaft gear, chain drive, kick starter, with Millford Corvette coach-built Sidecar .. £79 15

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## MOTOR CYCLES FOR SALE.

## Harley-Davidson.

**HARLEY-DAVIDSON**, 7-9 h.p., 1915, and £20 Watsonian de Luxe model, painted to match, fully equipped; £65, lowest; can be seen in London, 2103 Mayfair.—Wilfred Holmes, 82, Mortimer St., W. [5961]

**HARLEY-DAVIDSON** model 11F, Montgomery 20 gns. sidecar to match, completely equipped, F.E.S. lighting set, ridden 3 times only, unscratched; cost £100, accept £70; exceptional opportunity.—134b, Sea-view Rd., Liscard. [6198]

**HARLEY-DAVIDSON**, 1915 model 11F, 7-9 h.p., 3-speed, 700x80 Hutchinson extra heavy tyres, fitted with brand new Gloria 20 gns. coachbuilt sidecar, enamelled to match; £70.—The Premier Motor Co., Astor Rd., Birmingham. [6231]

**1915** (August) Harley-Davidson, 7-9 h.p., 3-speed, clutch model, electric lamp and horn, speedometer, Mills-Pulford sidecar, wind screen, and storm apron, only done 1,700 miles, good as new; cost over £100.—Best offers to Gillett, 48, Natal Rd., Bowes Park, N. [X0827]

**HARLEY-DAVIDSON**, purchased October, 1915, ridden 600 miles, 7-9 h.p., 1915-16 model 11F, and specially constructed sidecar, with built-in luggage grid and extra petrol can carrier, all as new, speedometer, lamps, 2 brakes, apron, etc., many accessories; owner proceeding to France; £95; no dealers; seen by appointment; would exchange for good modern 2-seater car of fair h.p.—Captain Ward, Tunbridge, Liphook, Hants. [5928]

## Hazlewood.

**1914** Hazlewood, 5-6 h.p. J.A.P. engine, 3-speed gear, £42; or with 1916 Mills-Pulford sidecar, £50.—Badeock, Mapledurham, near Reading. [X0819]

## Hobart.

**HOBART-VILLIERS**, 1915, 2½ h.p., a very sturdy little mount; accept £21, real bargain.—Layton's Garage, Bicester, Oxon. [X1002]

**2½ h.p.** Hobart, 2-stroke, new October, 1915, original tyres, unscratched, very fast, excellent condition, all accessories; £24; exchange 3½ h.p. Triumph, or 2½ h.p. Douglas.—Clark, High St., New Romney, Kent. [X0544]

## Humber.

**HUMBER** Lightweight; £5, cheap; must sell.—9, Gardiner St., Gillingham, Kent. [5924]

**3½ h.p.** 1911 Humber and sidecar; £15/10.—Wanchopes', 9, Shoe Lane, London. [6192]

**HUMBER**, 4 h.p., 2 speeds, free engine; 15 gns.—Miss Pilford, Greyhound Lane, Streatham, S.W. [6127]

**3½ h.p.** Humber, mag., 2-speed, new Dunlops, perfect running order; £6/10.—J. Howard, 172, St. Ann's Rd., Tottenham. [6040]

**HUMBER** Motor Bike and sidecar frame, just overhauled, in good condition; £25, or offers.—Box 479, c/o The Motor Cycle. [X0810]

**HUMBER**, 1913, 2½ h.p., absolutely reliable, perfect going order, new Hutchinson on back; £18, or near offer; trial by appointment.—Below.

**WOODEN** Shed, suitable for above, or separate, about 7ft.x4ft., 4 sides, sloping roof, raised floor; £3.—Write, Philipps, 50, Muswell Rd., N. Phone: North 18. [6061]

**3½ h.p.** Humber, 1914-15 model, 3-speed, kick start, new condition, C.B. sidecar; lightweight, or lady's, gent's cycles part.—10, Sydney Villas, Blyth Rd., Hayes, Middlesex. [6004]

**1912** Humber, 3½ h.p., 2-speed, F.E., handle starter, new gears fitted, and thoroughly overhauled; sound bargain; nearest to £21 secures.—Lee, 30, Haymeley Rd., Reading. [5912]

**HUMBER** Motor Cycle, 1913, 2-speed, free engine, and mag., tyres in perfect condition; £20, or nearest offer; can be seen any evening after 6.30.—Dey, 91, High Rd., Balham. [6019]

**1911** Humber, 2 speeds, free engine, recently overhauled, new Dunlop belt, new Skew back tyre, also cane side entrance, in good condition; £27.—Heathorn, Onslow St., Guildford. [X0750]

**HUMBER**, 1912, 3½ h.p., with wicker sidecar, 2 speeds and free engine, speedometer, horn, lamps, tools, etc., complete, excellent condition; £27.—534 Kingston Rd., Raynes Park, Surrey. [X0613]

## Indian.

**INDIAN**, new 1916, 5 h.p. model, actually in stock.—Moss, Wem. [X0391]

**INDIAN**, 1915, 5 h.p., T.T., 3 speeds, clutch, kick starter, like new; £50.—Earl, 5, Heath St., Hampstead. [6070]

**INDIAN**, 1914, 7 h.p., T.T., all accessories, specially tuned engine; £56.—Srauso, 4, Fennel St., Manchester. [X0945]

**1915** T.T. Indian, 3½ h.p., 3-speed, all accessories as new; £45, no offers.—Lieut., c/o 21, Dorking Rd., Tunbridge Wells, Kent. [X0834]

**INDIAN**, 1915, 7-9 h.p., road racer, clutch, special fast engine; £40.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0495]

**INDIAN**, 7-9 h.p.; 1913 model, good condition, with sidecar (almost new); £40.—Apply, Slane, 63, Britannia Rd., Waltham Green, London. [5951]

**INDIAN**, 1914, 7-9 h.p., T.T. model, clutch, extra fine condition, speedometer, mechanical horn £35.—Layton's Garage, Bicester, Oxon. [X0999]

## MOTOR CYCLES FOR SALE.

## Indian.

INDIAN, 1915 $\frac{1}{2}$ , 5h.p., 3-speed, etc., lamps, speedometer, cost over £70; 2,000 miles; £47 cash.—Scott, 16, Elmstone Rd., Fulham, S.W. [X0771]

INDIANS.—All models delivered now. You can be sure of good service at Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5991]

1914 Hendee Special Combination, first-class condition; £55, near offer; exchange B.S.A., 1915.—Richards, 81, Pinborough Rd., S. Kensington. [5979]

INDIAN and Sidecar, 1913, 2-speed, splendid order; £50; consider exchange lightweight, cash adjustment.—Shores and Co., Owston Ferry, Doncaster. [X0735]

1915 $\frac{1}{2}$  7-h.p. Indian, model C, 3-speed, electrically equipped, Montgomery sidecar, 1,700 miles; £75, or near offer.—Benham, Grasmere House, Shrewsbury. [X0870]

1914 7-h.p. Indian, 2 speeds, kick starter, handsome cane sidecar, very smart turnout; £55.—The Barnes Motor Garage, opposite Red Lion, Barnes, S.W. [6032]

7-h.p. Indian, model F, power plus, 1916, 3 speeds, speedometer, with luxurious sidecar, never been used, less than cost.—Ayscough, Penarth Hotel, Penarth (D). [X0216]

INDIAN, 5-h.p., clutch model, and Indian sidecar, perfect order, perfect condition, full accessories; absolute bargain, £27/10.—14, Doddbrook Rd., West Norwood. [6182]

INDIANS, all 1916 models, ex-stock, with and without sidecars, exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5185]

INDIAN, 7-h.p., clutch, 2-speed, just overhauled, new clutch parts and back cover, accessories, Milford sidecar; £45; owner now needs money.—25, Whitehall Park, N. (5 minutes from Highgate Tube Station). [5953]

INDIAN, 1911, 7-h.p., T.T. clutch model, with red torpedo sidecar, just overhauled, enamelled and plated, splendid order; £32, or near offer; trial run any time; owner joining up.—62, Pemberton Gardens, Junction Rd., Highgate. [6065]

INDIANS in Stock.—Latest models, Power Plus combinations, sporting Power Plus 3 speeds models, standard 7-h.p. overhead inlet combinations, with lighting set, the famous 5-h.p. 3-speed double-purpose mount and 7-h.p. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [X1023]

1915 Indian, bought new February, 1916, 7-h.p., spring frame, 3-speed, kick starter, electrically equipped, speedometer, T.T. bars, with Mills-Kulford coachbuilt sporting sidecar to match, only done few miles, otherwise brand new, smart sporting outfit; cost £98, take £70; consider Douglas part; must sell.—Brigstock Rd., Thornton Heath. [6051]

OWNER Called Up, hence price for quick sale.—Late 1914 (date guaranteed) 7-h.p. Indian, spring frame, 2 speeds, clutch, speedometer, not done 6,000, electric lamps, horn, 2 accumulators, new tyre, tools, etc., best sidecar with Wolbrown body, new tyre, all 28's, 3 aprom, etc.; first £43 secure; cheap at £60; gears, chains, etc., perfect.—H. Millard, Esq., Chesterfield. [X0874]

## Ivy.

IVY De Luxe, 1916, 2-stroke, T.T. bars, only used for a few miles; £27/10.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0552]

IVY De Luxe, 2-stroke, late 1915, 2-speed, P. and H. lamps, horn, mirror, tools, excellent condition; £30.—Wetton, St. Peter's Hill, Huntingdon. [6126]

## Ixon.

IXION-VILLIERS, 1914 $\frac{1}{2}$ , T.T., footboards, Miller lamps, tyres perfect, very fast, looks new, used weekends only; bargain £18/10.—Lahram, 25, 81st Crescent, Gunnersbury, W. [5996]

## James.

1916 James, 2-stroke, in stock.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X9818]

JAMES No. 6 Combinations in stock; no waiting.—Colmore Depot, 261, Deansgate, Manchester. [6026]

COLMORE Depot, 261, Deansgate, Manchester, have in stock complete range of James motor cycles. [18083]

JAMES Lightweight, absolutely new; £33, bargain; exchange combination.—249, Eglinton Rd., Woolwich. [6206]

JAMES Big Four Combination, 1915, 3-speed gear, all chain drive, Lucas dynamo lighting, and electrical horn, superior turnout; £70.—Colmore Depot, 31, Colmore Row, Birmingham. [X0923]

1915 James 3 $\frac{1}{2}$ -h.p. Twin, special engine, 3 speeds, Binks carburettor, Lucas lamp, horn, generator, Watford trip, spare T.T. bars, 3 sprockets, chains, touring sidecar, all T.T. pipes.—9, Granville Rd., Fallowfield, Manchester. [X0738]

JAMES, 1916, 3 $\frac{1}{2}$ -h.p. twin, 3-speed countershaft, h.c.c. clutch, kick start, Binks carburettor, T.T. bars, Palmer cord tyres, cost over £68 this month; not done 70 miles; accept £63; perfect throughout; exchange considered.—Ideal Cycle Co., Thundersley, Essex. [5927]

## J.E.S.

J.E.S. Motor Attachment, complete, cheap for spot cash.—Abingdon Brewery Co., Northampton. [X0546]

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1915 2 $\frac{1}{2}$ h.p. HAZLE WOOD-J.A.P., 3-speed, and Sidecar .....	60 0	20 0	71/8
1914 8 h.p. ZENITH, 2-shaft, and Sidecar .....	62 0	18 0	78/10
1915 HARLEY-DAVIDSON, elec. equipment .....	60 0	—	—
Mod. J 7-h.p. HARLEY-DAVIDSON, electric equipment, new; cost £86 13s. .....	76 13	26 13	86/7
1913 3 $\frac{1}{2}$ h.p. ARIEL, 3-sp. and Sidecar .....	40 0	10 0	53/9
1914 3 $\frac{1}{2}$ h.p. SUNBEAM, 3-speed, and Sidecar .....	65 0	25 0	71/8
Model F 1915 7-h.p. HARLEY-DAVIDSON and Watsonian coach-built Sidecar, fully equipped .....	65 0	—	—
1914 3 $\frac{1}{2}$ h.p. SUNBEAM .....	46 10	—	—
1914 8 h.p. BAT and 'Scar .....	55 0	15 10	71/8
1915 4 $\frac{1}{2}$ h.p. EXCELSIOR, soiled only .....	59 0	—	—
1915 CALTHORPE-J.A.P., 2-speed, new; cost £36 13s. .....	32 0	10 0	40/-
1915 3 $\frac{1}{2}$ h.p. ARIEL and Sidecar .....	59 0	15 10	71/8
1913 2 $\frac{1}{2}$ h.p. PREMIER .....	13 0	—	—
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IMMEDIATE Delivery of J.H. motor cycles: exchanges.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [5625]

J.H.—All 1916 models ex-actual stock; exchanges arranged; best allowance prices quoted.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. 'Phone: 552 Mayfair. [5888]

J.H.—Brand new late 1915 combination, 6-h.p. M.A.G. engine, 3-speed gear and chain drive, complete with Canoelet sidecar with hood and screen; list price £99; fully guaranteed and offered at £82/10.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5191]

## Juno.

JUNO, 2 $\frac{1}{2}$ -h.p., late 1915, Villiers engine, Dunlops, Amac, Druids, as new; £23, offers.—Strong, 41, Halstow Rd., East Greenwich. [X0733]

## Kerry.

3 $\frac{1}{2}$ -h.p. Kerry-Abingdon, clutch model, good running 2 $\frac{1}{2}$  order, nice appearance; cheap, £22.—Thomson, 85, Church Rd., Willesden. [5931]

1913 Kerry-Abingdon, 3 $\frac{1}{2}$ -h.p. free-engine model, overhauled, new cylinder, carburettor, Palmer Cord back cover, running better than new; £18/10.—44, Selwyn St., Rotherham. [X0964]

## King.

1912 Speed King 6-h.p. 2-speed Rex, in very good order, new belt and tyres; £26; easy payments arranged.—Jones, Garage, Broadway, Muswell Hill. [6242]

## Lea-Francis.

LEA-FRANCIS 3 $\frac{1}{2}$ -h.p. Twin, 1914, T.T. bars, Watford; £35.—Write for view, 1, Campbell Rd., Croydon. [0812]

LEA-FRANCIS, Lead sidecar, excellent condition, little used, new Dunlop tyres, with all best accessories; bargain, £50.—Crock, Church St. West, Macclesfield. [X0960]

## Levis.

LEVIS, new 1916 Popular model, ready for riding away.—Moss, Wem. [X0590]

1916 Levis Popular; £32, in stock.—Williams, Chapel Ash Depot, Wolverhampton. [X0905]

LEVIS Popular, 1915, T.T., all accessories; £21, lowest.—Keep, 3, Seed Hill House, Huddersfield. [X0929]

LEVIS, 2 $\frac{1}{2}$ -h.p., slightly soiled; cost £40, accept 30 gas.—Colmore Depot, 31, Colmore Row, Birmingham. [X0921]

COLMORE Depots, Birmingham and Leicester, for delivery of all models of Levis motor cycles from stock. [0804]

LEVIS Popular, or new model E; immediate delivery; easy terms 2 $\frac{1}{2}$  extra.—Referee Cycle Co., 332, High Holborn. [0764]

BABY Levis, 1914, countershaft, single, Binks, perfect; £18, lowest.—Prew, 136, Fortress Rd., London, N.W. [6167]

LEVISES.—Both models from stock; deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [5988]

LEVIS, 1916, Popular models.—We are sole Oxfordshire agents, and can deliver correctly tuned Popular models at once.—Layton's Garage, Bicester, Oxon. [X1003]

LEVIS Popular, latest 1916 models, ex-actual stock; exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5887]

LEVIS 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents. Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. 'Phone: 1432 Regent. [0711]

1915 2 $\frac{1}{2}$ -h.p. Levis 2-stroke, nearly new tyres, front and rear lamps, mechanical horn, 2 toolbags, all spares, engine guaranteed perfect; £23/10.—Robinson's Garage, Green St., Cambridge. [6116]

## Lincoln-Elk.

LINCOLN-ELK, 1912, 3 $\frac{1}{2}$ -h.p. Mabon clutch; £17/10.—121, St. George's Rd., Reading. [5911]

## Mabon.

MABON, 3 $\frac{1}{2}$ -h.p. mag., B.B., spring forks, fast and reliable, low; £7, bargain; exchange.—31, Capstone Rd., Bournemouth. [5937]

## Martin.

MARTIN 5-h.p. Twin, brand new; take £35; photo.—65a, Rosendale Rd., West Dulwich. [6157]

MARTIN-J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear, £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [0760]

## Matchless.

MATCHLESS, late 1913, kick start, accessories; £28, or exchange.—7, Surbiton Rd., Kingston. [5909]

MATCHLESS (1913), and tandem seated coachbuilt sidecar; £40.—Godwin, Hemel Hempstead. [5926]

1912 6-h.p. Matchless Coach Combination, 2-speed, speedometer; £38.—Blencathra, Highfield Rd., Walton-on-Thames. [X0974]

## MOTOR CYCLES FOR SALE.

## Matchless.

**MATCHLESS** and Sidecar, 6h.p., clutch; grand bargain, £34, or offer for quick sale.—Biggs, 16, Carthew Villas, Hammersmith. [6052]

**1915 3½ h.p. Matchless** (Alldays), free engine, handle starting, splendid order; £30.—Colmore Depot, 31, Colmore Row, Birmingham. [X0917]

**MATCHLESS 1915 8B** Combination, complete with Lucas dynamo lighting, splendid turnout; £80.—Colmore Depot, 31, Colmore Row, Birmingham. [X0924]

**1912 8h.p. Twin Matchless** and wicker sidecar, Nala 2-speed, Whittle belt, Lucas set, Cowey speedometer; £45, or near offer.—Moore's Presto Works, Croydon. [5946]

**MATCHLESS 1915 7-9h.p. Combination**, M.A.G. engine, 3 lamps, Jones speedometer, child's pillion seat, carefully driven fine Sundays only, just overhauled; £75.—29, Portland Rd., Finsbury Park. [6209]

**1913 6-speed Matchless** Coachbuilt Combination, fitted with perfect dynamo lighting set, tyres and belt almost new; £65 for quick sale.—Write, making appointment, H.C., 118, Beckton Rd., Cusston House. [6041]

**1914 (May) Matchless Combination**, 7-9h.p., 3-speed gear, all chain drive, nearly new tyres, entirely repainted and overhauled, complete Cowey speedometer, Lucas lamp set, horn, rear light, etc.; genuine bargain, £75.—Willways, Ltd., Bristol. [X0979]

**MATCHLESS, 1914, 8h.p. M.A.G. engine**, 3 speeds, fitted with Collier's special sidecar and Lucas dynamo lighting outfit with 3 lamps, Watford speedometer, excellent order; £82.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5884]

**MATCHLESS Combination, 1914-1915, 7h.p. M.A.G. engine**, 3-speed countershaft gear, speedometer, lamps, new Palmer cord tyres, screen, etc., almost new condition, total mileage 4,000, the Rolls-Royce of motor cycles; great bargain, 65 gns.; another machine considered in part.—Longman, King St., Acton. Phone: 1578 Chiswick. [6012]

## Minerva.

**3½ h.p. Minerva**, m.o.v., mag., 2-speed; £10.—Edwards, 22, Daves St., Bolton. [5983]

**3½ h.p. Minerva**, re-bushed, mag., T.T. bars; bargain, £2.—55, Wolsey Av., Walthamstow. [5977]

**3 h.p. Minerva**, B.B., good tyres, good running order; £6, offer.—585, York Rd., Wandsworth. [6076]

**MINERVA, 3½ h.p.**, adjustable pulley, B.B., m.o.i.v., perfect; £4/15.—Aldelene, Offington Lane, Wrotham. [6088]

**MINERVA, 2h.p.**, faultless, low, wants tuning; first £3 secures.—Barfield, 7, Fairfax Rd., Hampton Wick. [X0779]

**MINERVA, 2½ h.p.**, side by side valves, mag. ignition, really excellent condition, smart appearance; £8/10.—Longman, King St., Acton. [6014]

**MINERVA, 3½ h.p.**, Bosch mag., in splendid condition throughout, including enamel and plate; £13/13.—Egbert Spearman, Bishop's Stortford. [5606]

## Moto-Reve.

**MOTO-REVE, 2½ h.p.**, mag., Druids, Amac, re-enamelled, goes fine; £2.—Desoutter, 4, Hanover St., London, W. [6211]

## Motosacoche.

**MOTOSACOCHE, 2½ h.p.**, quite new, variable gear, Druids; best offer.—46, Hanover St., Islington, N. [6172]

**3½ h.p. M.A.G. Engine** Motosacoche, Enfield 2-speed gear, 1913; 27 gns.—Troward, Heathurst, Vale of Health, Hampstead. [6105]

**1913 3½ h.p. Twin Motosacoche**, all chain drive, Enfield gear, Brooks B170, semi T.T. bars, lamp, horn, tools, etc.; owner serving; given away at £25, no offers.—Box L1,480, c/o The Motor Cycle. [6023]

## New Hudson.

**NEW Hudson, 3½ h.p.**, 3-speed, coach sidecar, 1913; 30 gns.—Troward, Heathurst, Vale of Health, Hampstead. [6106]

**1915 New Hudson, 2-stroke, 2-speed**, lamps, horn, etc., in good condition; £30.—Hilton, Sharp, and Co., Ltd., Foxhall Sq., Blackpool. [X9817]

**NEW Hudson, 2-stroke**, lamps, tools, 1915 model, splendid condition, small mileage; £22.—Elkins, 50, Conyers Rd., Streatham, London. [X0563]

**NEW Hudson 2-stroke** Lightweight, special Dunlops, Miller head set, panniers, etc.; £22, as new.—33, Cadogan Terrace, Victoria Park, London. [6100]

**1913 3½ h.p. New Hudson, Armstrong 3-speed**, all perfect order, excellent condition, £22/10; coachbuilt sidecar, cost 12 gns., £4/10; must clear.—Elsha, Selsey, Sussex. [6214]

**LATE 1913 4h.p. New Hudson Combination**, 3-speed, clutch, kick starter, coachbuilt sidecar, nearly new tyres, beautiful condition throughout, had little use; any trial or expert examination; sacrifice £40.—Grutton, Dimple Store, Matlock. [X0877]

## New Imperial.

**NEW Imperial, latest model**, in stock; no waiting.—Rose, Imperial Agent, Uxbridge. [6125]

**NEW Imperial, 1915, 2-speed**; 24 gns.—Troward, Heathurst, Vale of Health, Hampstead. [6107]

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2 1/2	h.p. J.A.P.-WOLF, 2-speed, second-hand	£20
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2 1/2	h.p. WOLF, 2-speed, unused	£23
2 1/2	h.p. J.A.P.-WOLF, single-speed, unused	£28
1 1/2	h.p. J.A.P.-WOLF, single-speed, sec-hand	£24
1 1/2	h.p. J.A.P.-WOLF, 2-speed, second-hand	£28
1 1/2	h.p. WOLF-ARNO, single-speed, sec-hand	£26
1 1/2	h.p. WOLF-ARNO, 2-speed, second-hand	£27
3	DAYTON, 2-stroke, unused	£15
3	DAYTON de Luxe, 2-stroke, unused	£16
1	Racing Motor Cycle, 8-h.p. J.A.P., heavy tyres, 90 miles per hour	£35
2	GODIVA Sidecars, Sporting model	£6
1	Cane Sidecar, Sporting model	£5

TRIUMPHS, also PREMIER, NEW HUDSON, and ZENITH Combinations up to £65.

**ORACLE MOTOR CO.,**  
336, GRAY'S INN ROAD,  
King's Cross, London, W.C.

## MOTOR CYCLES FOR SALE.

## New Imperial.

**COLMORE Depots, Manchester and Leicester**, for immediate delivery of New Imperial motor cycles. [X0805]

**IMPERIAL-J.A.P., 1916, latest model**, 2-speed, in stock; £32.—Layton's Garage, Bicester, Oxon. [X1004]

**NEW Imperial, 2-speed**, variable ignition; £25.—Doctor, 387, London Rd., Thornton Heath. [6067]

**NEW Imperial, light tourist**, immediate delivery; cash or easy terms.—Referee Cycle Co., 332, High Holborn. [6076]

**1916 2½ h.p. New Imperial-Jap, 2-speeder**, only 10 days old, perfect; £34/10.—Crow Bros., Guildford. [5091]

**NEW Imperials, latest models in stock**; 2-speed, also kick-starter hand-controlled clutch models.—P. J. Evans, John Bright St., Birmingham. [X1024]

**IMPERIAL-J.A.P., 2½ h.p., 2-speed, clutch**, and kick starter, with Moto-Gum sidecar, all new April, 1916; £45.—Ling, South Ockendon, Essex. [X0814]

**NEW Imperial-Japs, latest 1916 models**, for immediate delivery from stock; £38; 2-speed countershaft gear and free engine; exchange or extended payments.—Wanchope's, 9, Shoe Lane, Fleet St., London. [6188]

## New Ryder.

**NEW Ryder-Jap, 1915, 2-speed**, new December; 25 gns.—Troward, Heathurst, Vale of Health, Hampstead. [6108]

**NEW Ryder-Jap, late 1915, 2 speeds**, lamps, generator, horn, and tools, like new; £27/10.—Earl, 5, Heath St., Hampstead. [6073]

**1914 (used six times) New Ryder, 2½ h.p., 2-speed**, rear light, Miller lamp, horn, 25 gns.; portable shed. £2.—7, Wrotham Rd., Gravesend. [6021]

## N.S.U.

**N.S.U., 3½ h.p.**, spring forks, mag., F.E. clutch, Empire de Luxe saddle, B. and B. carburetter; £10, cheap.—60, Alma Rd., Peterborough. [X0875]

**N.S.U. 1914 Twin, 3½ h.p., 2-speed**, mechanical lubricator, £25; also sidecar, £5, torpedo, coachbuilt.—J. Ormand, Beelsby, Grimsby. [X0826]

## O.K.

**O.K., 2-stroke, 2-speed, 1915**, shop-soiled; £26/10.—Mundy, Somerton, Somerset. [6204]

**O.K. Junior, 2-speed, 1915**, been 500 miles; take £25.—65a, Rosendale Rd., West Dulwich. [6158]

**O.K., 1915 (May), 2-stroke, 2½ h.p., 2-speed**, unscratched, as new, complete lamp, horn; bargain, £26.—Withers, Wisemore St., Walsall. [X0760]

**O.K., complete with lamps, horn, tools**, cost £37/10 new last October, will take £22; 2½ h.p., 2-speed, only done 800 miles.—Lieut. Stock, R.M. Barracks, Chatham. [5978]

**If You Are Requiring a really good lightweight 4-stroke**, what's wrong with the latest O.K.'s at reduced prices? Mark IV., J.A.P. engine, 2 speeds, £36; Mark VI., M.A.G. engine, 2½ h.p., 2 speeds, £40. Exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5889]

## P. and M.

**P. and M., 3½ h.p., 2-speed gear**, mag.; must sell; £10.—9, Waldegrave Rd., Teddington. [6175]

**P. and M., 3½ h.p., 2 speeds**, and coachbuilt sidecar, fully equipped and in lovely condition; £29/10.—Crow Bros., Guildford. [5090]

**1914 3½ h.p. P. and M., 2-speed**, wicker sidecar, in perfect condition; cash or easy terms; £24.—R. E. Jones (Garages), Ltd., Swansea. [6072]

**1914 P. and M. and Corvette Coachbuilt Sidecar**, in excellent condition; not done 300 miles, many spares; £70.—Box L1,487, c/o The Motor Cycle. [6235]

**1915 P. and M., with 11 gn. sidecar**, fitted wind screen, large P. and H. lamps, spare tyre, unriden since August; bargain, £57/10.—Sutcliffe, Willow Gardens, Halifax. [X0931]

**P. and M., 3½ h.p., 1913 model**, kick start, 2 speeds, excellent condition, and will take a sidecar anywhere; £35.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [5885]

**P. and M. Twin, 1915**, fitted with luxuriously appointed Gloria sidecar, in absolutely new condition in every way, the most perfect motor cycle on the road, as per illustration in "The Motor Cycle" issue 11th; a bargain, £95.—Embryo Cycle and Motor Co., Charlotte St., Hull. [5967]

## Peugeot.

**7 h.p. Peugeot, 2-speed**, in splendid condition, with pillion seat, coach sidecar; price £28.—10, Ada Rd., Brunswick Sq., Camberwell, S.E. [6251]

## Precision.

**2 1/2 h.p. Precision-Torpedo, 2-speed**; free; £24; exchange combination.—Brett, Masingham, Lynn. [6131]

## Premier.

**PREMIER, 1913, 3½ h.p.**, footboards, good reliable machine, take sidecar, good tyres and belt; £20.—Lee, Nichols St., Leicester. [X0550]

**PREMIER, 3½ h.p., T.T. engine**, Binks carburetter, in splendid condition; for quick sale £24, or near offer.—101, Tooting Bec Rd., S.W. [6087]

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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## Editorial Offices:

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Telegrams: "Motorcycle, Coventry."  
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## Northern Offices:

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Subscription Rates: Home, 6s. 6d.; all countries abroad, 10s. 10d. per annum.

UNITED STATES—The International News Agency, New York.

CANADA—Toronto News Co., Ltd., Toronto; Montreal News Co., Ltd., Montreal; Winnipeg News Co., Winnipeg; British Columbia News Co., Vancouver; Gordon & Gotch, Ltd., 132, Bay Street, Toronto.

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## Export Difficulties.

**L**AST March we devoted considerable space to the difficulties with which manufacturers of motor cycles had to contend in the transport of goods and the delay in shipment as well as the delay in obtaining licences to ship abroad. It will be recalled that we invited the opinions of different manufacturers, and that the evidence forthcoming was by no means a compliment to the Board of Trade, even acknowledging the difficulties with which the authorities are confronted. The correspondence in question, as received from the different makers, was submitted to the Board of Trade on the 17th March last, and a reply is now forthcoming as under:

"With further reference to your letter of the 17th March, regarding difficulties experienced by exporters of motor cycles, sidecars, and accessories, I am directed by the Board of Trade to state that they understand from the War Trade Department that the delay in connection with Messrs. Hobart Bird's applications for licences was due to the fact that enquiries had to be made regarding the consignees, but that certain of the licences have now been issued. The delay in the case of the Sun Cycle Co.'s application was due to the special arrangements that have to be made for Swedish traffic.

"With regard to the railway difficulties referred to in the enclosure to your letter, I am to say that the railway companies are not in a position to forward goods until they are informed by the dock authorities or shipowners that the vessels by which the goods are to be shipped are able to accept them."

## Expert View of the Machine Gun Sidecar.

**I**T is but a few weeks ago that we discussed the question of armoured cars *v.* armoured sidecars, enumerating the advantages of each type. We made no pronounced claim for either so far as the suppression of the opposite type was concerned, our considered opinion pointing rather to the good uses and possibilities of both types. Where the armoured

car scores is in the adequacy of the protection which can be provided for the occupants. The sidecar, on the other hand, carries no real protection, but in some respects is no worse for that, as it is rendered much less obtrusive. It is thus able to steal nearer to the points of action without observation. Another strong point in favour of the gun-mounted sidecar which we pointed out was the comparatively small amount of room that such a vehicle occupies on the road. This is a most important consideration. One is permitted to discuss in this wise the advantages of the armoured sidecar and armoured car, as up to the present trench warfare has deprived either type of showing up its capabilities in the real field of operations, but the time will assuredly come. In this connection it is interesting to quote the undermentioned extract from a personal letter by a member of the staff of General Joffre published in *The New York Tribune*. This letter says:

"The motor cycle armed with a small mitrailleuse such as we now employ is much more useful than the armoured motor car. It is very small. One can come very near to the enemy without being seen. One can hide behind trees bordering the road, make an attack upon an advance guard, and get away quickly and safely. If the road is bad one can take the muddy sides and avoid the big holes, which are disastrous for heavy carriages. One clever rider and good shot can do great harm in a few minutes. As soon as he arrives at the place from which he wishes to attack he can put his mitrailleuse in position and destroy a patrol, or a convoy, or even an advance guard, and speed back to his own lines at eighty kilometres an hour. He can change his position so often and so quickly that the enemy's detachment cannot find his firing position. In the country he offers only a very small target compared with the big side of a steel-covered motor car.

"Three of our cycle mitrailleuse accomplished the other day a wonderful raid. They heard that a German regiment was going to enter, music ahead, a village. They arrived in front of the column and hid behind bushes. As the first ranks of the Germans entered our three men fanned them with the motor cycle guns. Every man in the German regiment was not only wounded, but killed."



## KINKY BILL.

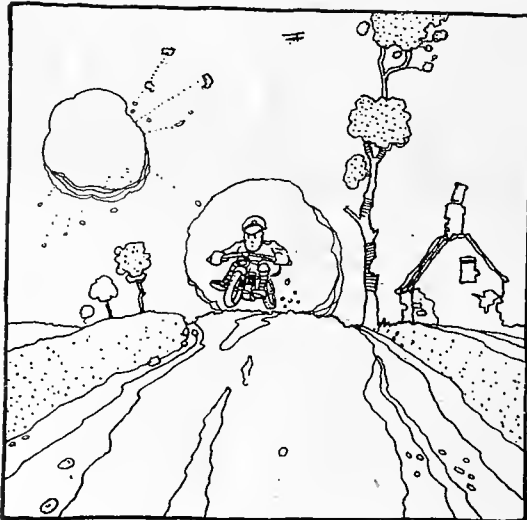
D'yer see that motor bike just there? That's Kinky Bill—my 'bus—  
A most astoundin' blighter, an amazin' sorter cuss,  
'Oo makes them pore deluded fellers from the trenches larf,  
But when they've got to pad their bloomin' 'oof I smiles,  
not 'arf.

Why do I call 'im Kinky Bill? It 'appened just like this,  
'E got 'is kinks through playin' at a game called "'It or Miss,"  
A black Maria didn't miss nor yet exactly 'it,  
But put old Kinky William out of action for a bit.

I sat down by the roadside and I did the best I could  
To stick the bits together same as anybody would;  
Our mud 'eap wasn't 'ealthy; the despatch was urgent too,  
So I ses to Kinky William, "It's the Push, me lad, for you."

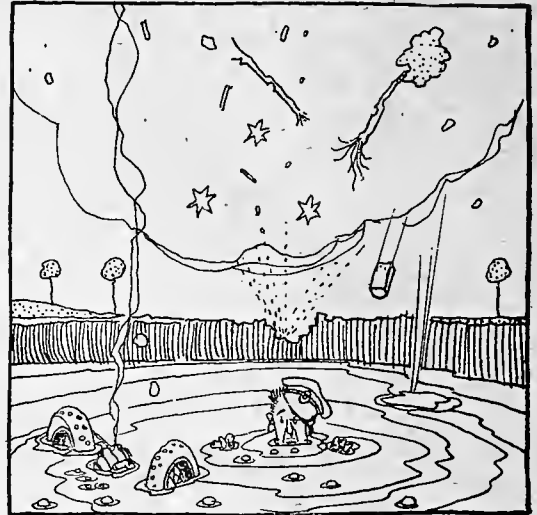
With that I swung me leg across an' kicked till all was blue,  
But not a grunt. "That Push," I ses, "is meant for me,  
not you."  
So off I 'opped and shoved, and then, just when I'd got  
the pip,  
That lop-eared engine started, and we didn't 'arf let rip.

'E ditched me five or six times, all the same we 'ummed  
along  
Until I sees some pavvy, when 'is Kinks was goin' strong,  
Outside a little village where the 'Uns 'ad got the range,  
And after miles of slush I thought the pavvy'd be a change.



"That lop-eared engine started, and we didn't 'arf let rip."

It was—a lightnin' change. Ole Kinky did a record slide,  
And, waltzin' to the deepest ditch in all the countryside,  
Skidded orf the bloomin' map, 'e did—and dropped me  
fairly in  
To twenty feet of water, but I guess that saved me skin.



"Skidded orf the bloomin' map, 'e did—and dropped me  
fairly in  
To twenty feet of water, but I guess that saved me skin."

For as I landed on me 'ead I 'eard a mighty bump—  
About a ton of 'ate came down and busted with a crump—  
And if I'd bin on top there—well, I *wouldn't* be there,  
see?

But my ole 'bus 'ad found a trench to shelter 'im and me.

So I ses, "Tippit," ducks me 'ead, and sits tight through  
it all,  
A-thinkin' of what might 'ave been but for that lucky fall;  
And when the 'Uns stopped stravin' sorter crawled out  
ginger like,  
Both drippin' wet but still thumbs up, me and the motor  
bike.

Now ain't it reel intelligent the 'uman kinder way  
That 'arf-cock jigger saved me life and brought me 'ome  
all gay?

It is, and it don't worry me what any feller thinks,  
Because I don't forget the day when Kinky got 'is kinks.

—W. W. ABBOTT.

## MUD BLISTERS.

**D**URING wet weather tyres are particularly susceptible to an ailment known as "mud blisters," which, if neglected in the early stages, will make themselves felt later on, and are just as much calculated to ruin a new tyre as an old one.

Mud blisters are caused, in the first place, by a small cut in the tread. Moisture works into the cut, and is forced towards the edge of the tyre, gradually separating the rubber from the canvas in that direction. In the cavity thus formed grit and mud accumulate, slowly forming a large hard lump of solid dirt at the edge of the tread between the canvas and the rubber covering.

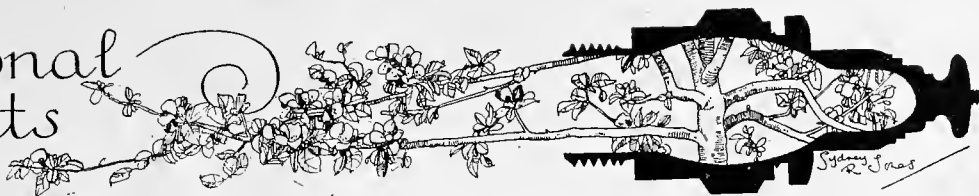
If a blister of this kind is not noticed till it has attained a considerable size, I think the best plan is to attend as effectively as possible to the cut and leave the blister alone. For should one cut it, the tension causes the rubber to split for the entire length of the gathering, with the result that an ugly and almost irreparable gash is formed.

As a rule, these gatherings are noticed in the early stages, however, when they should be attended to immediately. Make a small longitudinal cut at the edge of the blister and as far from the tread as possible with a sharp penknife, and carefully scrape out all accumulated grit, finally scrubbing inside and out with an old tooth-brush, attending to the original cut in the same way. The latter can then be repaired with "Filcut" or some other suitable preparation, but the insertion at the edge of the tread will probably require rather different treatment. If it is sufficient distance from the tread, and if the cover is of good quality rubber, I have found the best repair is effected by carefully covering the defect with a "Patchquick" patch, which will wear indefinitely, so long as it is not actually in contact with the road.

Prevention is a great deal better than cure, however, and during wet weather the treads of tyres should be regularly examined for cuts, and attended to accordingly. B.

# Occasional Comments

by "Ixion"



## Watch for Leaks.

The petrol system has taught many of us that few motor bicycles are free from petrol leaks; the green tinge of the mixture soon shows where the leak occurs, and then we begin to learn how difficult it is to find a petrol tap which is leak-proof. With No. 1 spirit at 2s. 6d. nobody likes leaks, and I advise my readers to dye a tankful of spirit, and see whether all their consumption is genuinely passing through the engine. I do not know of any objection to dyeing a gallon of spirit with a penny packet of aniline dye, but anyhow a very slight admixture of engine oil will serve to colour the spirit and betray unsuspected leaks.

## Testing Heavy Fuels.

Like most motor cyclists I am busy experimenting with heavy fuels, ranging from the petrol-paraffin mixture to special substitutes lighter than paraffin. In such work one really needs an auxiliary tank to hold pure petrol for starting and warming up purposes, nor are such tanks dear to buy. Still, I do not use them, because they necessitate coupling up a double supply pipe with a two-way tap, and if the tests cover more than one machine, the necessary alterations imply a lot of fiddling work with a soldering iron, and dearly as I love my handy little Tinol outfit, I dislike interfering with a petrol system which isn't leaking anywhere. So I have two dodges which eliminate the spare tank. If the fuel I am using has already been proved usable, I fill the main tank with it, and carry a little leather holster holding a fat petrol can containing a gill or so of pure spirit. Then I always stop the engine by turning off the tap of the main tank, and when a restart is due, slip off the cover of the float chamber and fill it by hand with petrol.

## Vaporising Heavy Fuels.

So far as my rough and ready tests go, two minor points are essential to ensuring good vaporisation of a heavy fuel. The one is a hot air supply, the other is a fine jet. It is astonishing what results one can get out of heavy specific gravities if these essentials are arranged; a mixture of one-third paraffin with two-thirds petrol behaves quite decently. The hot air supply is not difficult to fake up; if the necessary metal work baffles an amateur mechanic, rubber hose of the type used on car water-cooling systems will make elbow joints with the minimum of trouble, and so enable the least promising air intake to be hitched on to the cylinder walls or the exhaust pipe. The fine jet is more tiresome, but equally essential. The Binks three-jet carburetter should be immensely popular for this purpose, as it will atomise almost anything. Failing a Binks, there are carburetters which possess extra atomising appliances placed over a single jet; and, failing these, there are inexpensive fitments, e.g., the Terry jet cover, which all help to break up a liquid spirit emerging from the standard single orifice jet. The numerous riders who are try-

ing to keep down their fuel bills should keep these two principles in mind, viz., that heat and fine jet orifices are sure to be their principal needs.

## Caught Napping.

I was tempted by the fine weather this week into venturing out on a short trip in my walking clothes. Being a canny chiel, my spanner and spare sparking plug always repose in the side pocket of my driving jacket, and were therefore left at home. Before long I got down into a dip, out of which two roads emerged, both including a very decent stretch of 1 in 5 gradient. The sparking plug of the back cylinder chose this moment to soot up, and I made the horrifying discovery that I had no spanner. Fortunately, my low gear was very low indeed; so I made a rush at one of the hills on one cylinder, and made a clean ascent. This little incident indicates the progress British motor cycles are making. Not long ago—to be precise, in the A.C.U. Six Days of 1911—a 1 in 5 hill was regarded as a goodish test for a crack rider mounted on a perfectly tuned jigger. To-day, one can take such a hill on the front cylinder of a 3½ h.p. twin, thanks to the low emergency gear provided. I should add that the total length of the hill in question is one and a half miles, though the single figure gradient does not exceed 200 yards.

## An Unsolved Problem.

The machine above referred to was a horizontal twin, and it is a curious thing that though this type of engine has now been many years on the market, none of its devotees have quite solved the problem of equalising the lubrication of the two cylinders, which strikes an ignoramus like myself as a far simpler problem than it is with the V twin. Oiling is all but even nowadays on the best V twins, but though I believe I have owned every known make of horizontal twin, I always turn instinctively to their rear sparking plugs, when a cylinder chips out, and I am very seldom disappointed. An optimist would, of course, say that one of the great merits of the "flat" twin is that you always know which plug to clean when misfiring begins; but at the risk of being termed cynical, I will emphasise the fact that even oiling is more vital to the horizontal twin than to the V. A V twin has no particular balance to boast of, even when it is in the pink, and a little extra disturbance of the balance doesn't matter very specially. But a good horizontal twin has a very decent balance indeed when it is in perfect order, and uneven oiling means much more than the risk of periodically sooted plugs. It means that the valves of the back cylinder get foul sooner than their forward brethren, and that the carbon deposits astern are the more rapid and the heavier. Both of these factors impair balance. Therefore it is eminently desirable that Messrs. Douglas, Brough, Bradshaw and Co., should work out a perfectly even oiling system for their delightful engines as soon as possible.

## A MODERNISED MOTOR TRICYCLE.

Some Ingenious Ideas of an Enthusiastic Amateur Mechanic.

IN view of the recent remarks made by our contributor "Ixion," concerning the lack of initiative shown by manufacturers in designing an up-to-date motor tricycle, the following description of a three-wheeled vehicle, built from parts of an old tricycle by Mr. Leonard Jones, Glenfern, Alexandra Road, North Finchley, N.W., will undoubtedly be of interest. Mr. Jones is a most enthusiastic and exceedingly skilled amateur mechanic, who, moreover, has had great experience with three-wheeled motor vehicles. His name first came into prominence before readers of *The Motor Cycle* in June, 1903, but it was on June 27th of that year that he first made his *début* as a competition rider. This was in the famous 200 miles reliability trial organised by the M.C.C. for the S. F. Edge trophy. Previous to holding the competition, the following comment on the trial appeared in *The Motor Cycle*: "The 200 miles trial, as practically all motor cyclists know, is a test of both man and machine, as only a thoroughly seasoned and skilful rider can accomplish it without some involuntary stops, however good his machine may be. It not only means smartness and ready resource on the road, but a careful preparation of the cycle before the start, and, last but not least, some little physical endurance." How true those words were only those who can call to mind the unreliability of the

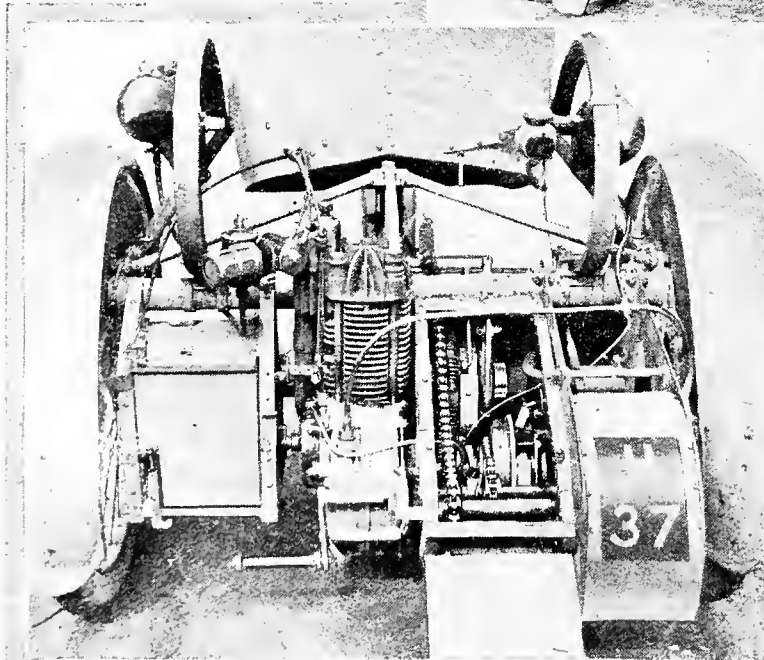
AN OLD  
THREE-WHEELER  
BROUGHT UP TO DATE  
BY A KEEN AND  
CAPABLE AMATEUR.

motor cycles of those days can fully realise. There is little doubt that when Mr. S. F. Edge gave the cup he expected it would be won outright on the first day, but there were four consecutive rounds before the contest was decided. In three of these Mr. Jones made a non-stop run on his  $1\frac{3}{4}$  h.p. De Dion tricycle, which was the smallest engine entered, and covered altogether 750 miles without experiencing trouble. What was to have been the final was spoilt by Cowles, Jones, and Milligan making non-stop runs. Then came the postponed final on November 7th, a Saturday. Cowles was disqualified because a screw on his luggage carrier shook loose, but the two other invincibles, Jones and Milligan, made non-stop runs. The trial was continued on the Monday, when the wonderful tricycle was thrown out of commission through a



(Upper) General view of the tricycle, with Mr. Leonard Jones at the wheel.

(Lower) Engine and transmission. This should be studied in conjunction with the diagram on page 533.

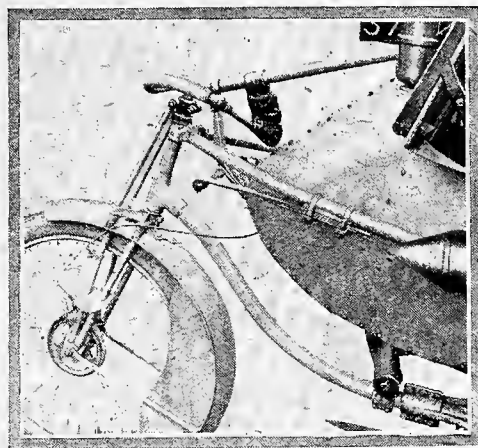


puncture on a patch of new metal near Hockliffe, leaving Milligan, the Bradbury rider, the winner. In this event any sort of stop was counted against the competitor.

Practically every part of this machine, except such fittings as engine, back axle, and those parts which are obviously the products of the factory, has been manufactured by Mr. Jones in his own workshop, the interior of which we illustrate. As will be noticed, the lathe is power driven, the motive

**A Modernised Motor Tricycle.—**

power being a 2-h.p. water-cooled Iris engine. Now the Iris, a French machine, was one of the first motor bicycles in this country which had a water-cooled power plant. Mr. Jones was exceptionally lucky in having picked it up for the sum of 30s. He did a good deal of work to it, fitting it with a mechanically-operated inlet valve, magneto ignition, and so on. This is one of the few motor cycle engines we know of running on coal gas. The gas bag is made out of a football bladder, while the Brown and Barlow carburetter, which was specially adapted, forms the mixing chamber. The float chamber is done away with, and underneath where the gas is introduced is a small suction valve through which the gas is drawn into the engine. The throttle is retained, but the extra air inlet has been blocked up, the air supply, which is adjustable, being immediately below the admission valve.



Front wheel, showing steering arrangements.

**Three Engines—One Magneto.**

In addition to the tricycle, Mr. Jones has also an ingenious four-wheeler. For the three engines there is only one magneto, which is so attached that it can be instantly removed from the four-wheeler or the tricycle to the power plant. Though small, the workshop is exceedingly well equipped, and, having the necessary skill and knowledge, Mr. Jones is capable of doing practically all engineering work. A short reference was made to the tricycle in the issue of *The Motor Cycle* of September 18th, 1913, but this dealt more with its behaviour on the road than with its mechanical details.

**The Three-wheeler.**

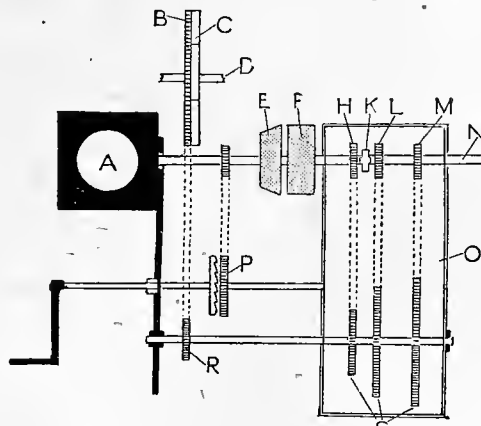
The actual machine is built up largely of old De Dion parts—that is to say, the engine, back axle, and wheels are remnants of an old tricycle. The engine, however, has been rebored, and instead of being 75 mm. x 76 mm. is now 78 mm. x 76 mm. The transmission and gearing are both interesting and ingenious, and the accompanying diagrammatic drawing will show the manner in which the change of speed is effected. The drive is through a cone clutch and universal joint to a countershaft on which are mounted three sprockets. Of these the two nearer the engine are free on the shaft, but can be locked thereto by the intermediate dog clutches. The sprocket, however, on the extreme right is mounted on a free-wheel. All three sprockets that they drive on the countershaft are,

therefore, fixed solidly. When the dog clutch is in the centre, the low gear is in engagement, and the free-wheel clutch will come into operation as soon as the engine begins to drive, but in the event of the dog clutch being moved either to the left or right to engage either the second or top speeds the drive is taken on one of these sprockets, with the result that the large chain wheel on the countershaft causes the free-wheel to over-run. We therefore get an excellent three-speed with a minimum number of moving parts. The final drive is through a small sprocket on the extreme left of the countershaft by a heavy Renold chain to the sprocket on the back axle, which is provided with a spring drive, thus tending towards sweetness of transmission and prolonging the life of the chains. It is interesting to note that the outer member of the cone clutch is in two halves, so that it may be dismantled without interfering with the rest of the mechanism. An ingeniously contrived

universal joint is interposed between the engine shaft and its extension, thus making up for any variation in alignment due to torsional stresses. On the left of the engine is a box in which the magneto is contained. It is, therefore, completely enclosed, but is easily accessible, as the lid may be instantly removed, and the magneto taken out merely by undoing one nut.

The transmission is enclosed, a flexible leather covering enclosing the clutch and starting gear mechanism, while a sliding cover in the compartment on the right totally encloses the gears. Oil is contained in a tank on the right-hand side of the vehicle, and an oil pump conducts the lubricant through branch pipes, of which one goes to the hollow gearshaft, lubricating the transmission, a thin branch goes to the inclined plane which actuates the clutch and the shaft upon which it is mounted, while the remainder goes to the crank case. Furthermore, the crank case release is directed on to the main driving chains. The main solid axle of the vehicle is, as will be noticed, stayed by a kingpost arrangement above.

The frame has been entirely constructed by Mr. Jones. The top portion forms a complete triangle from the main axle to the head, and underneath to the centre of the live axle casing is a long curved tube, which is further triangularly stayed by tubes running from the end of the axle casing to a point halfway up the main central tube, while there is a further stay from the bottom of the engine crank case to the same tube. The body, also built by the owner,



Diagrammatic view of transmission and gearing on Mr. Leonard Jones's tricycle.

- |                       |  |
|-----------------------|--|
| A. Engine             | M. First speed                           |
| B. Driven chain wheel | N. Hollow shaft for lubrication          |
| C. Spring drive       | O. Gear box                              |
| D. Main axle          | P. Starting gear                         |
| E. Clutch             | R. Small driving chain wheel             |
| F. Universal joint    | S. Three chain wheels all keyed on shaft |
| H. Third speed        |  |
| K. Dog clutches       |  |
| L. Second speed       |  |



**A Modernised Motor Tricycle.—**

has a shock absorber fitted beneath it in addition to being suspended on springs, and is made of Duralumin, that wonderfully light and tough material produced by Vickers-Maxim. The weight of the metal alone in the body only amounts to 6 lb. The engine is fitted with a special sparking plug of Mr. Jones's invention and construction.

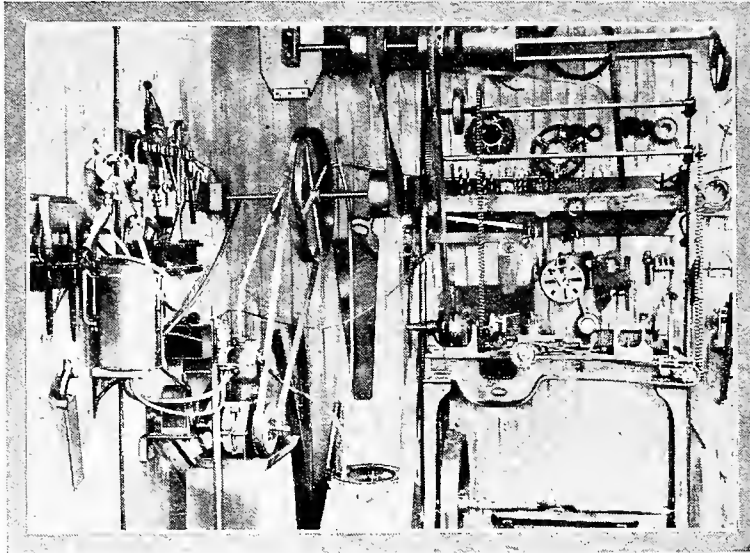
**A Most Ingenious Speedometer.**

The neat adjustable celluloid wind-screen is worthy of attention, as is also the special speedometer, which, too, is the outcome of Mr. Jones's ingenuity. This is provided with a governor wheel eccentrically mounted, after the style of the ordinary Watford or Smith speedometer. These wheels are kept in position by a spring, and as the speed increases

so the wheel tends to assume a flatter position, and in doing so it actuates the lever arrangement, which in most speedometers is coupled up to the indicator hand.

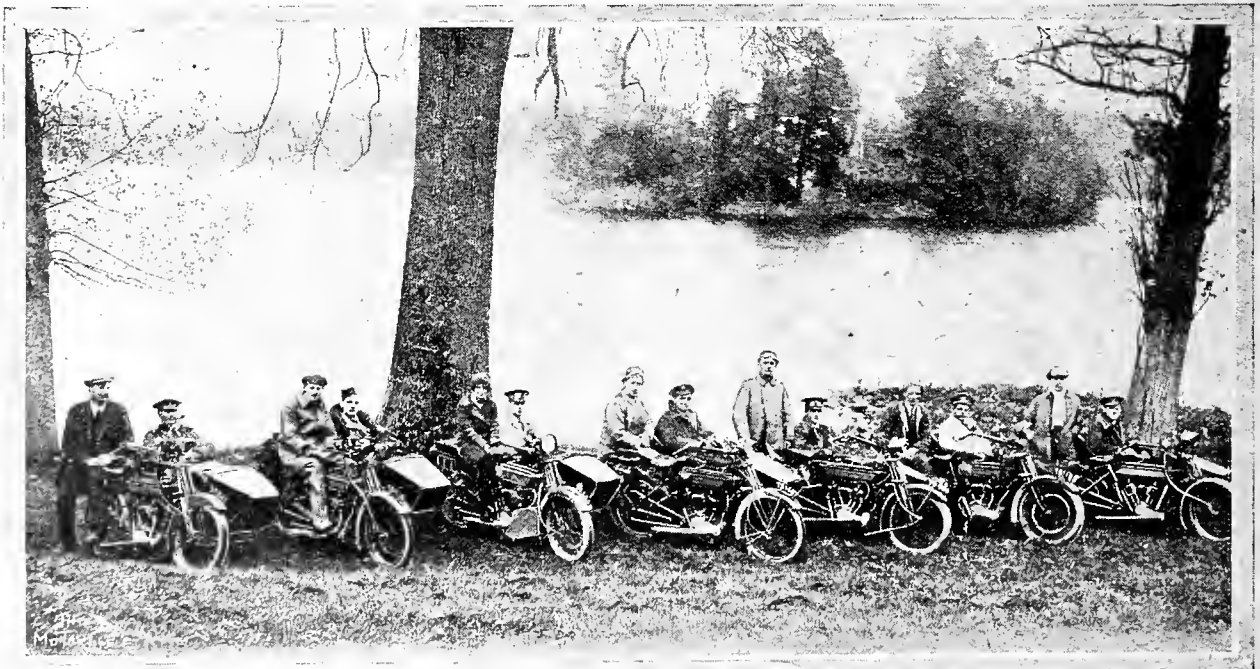
This, however, is not the case with Mr. Jones's invention. The lever acts upon a series of aneroid vacuum boxes, which in this case are filled with a mixture of oil and glycerine. The pressure of the lever on these tends to cause the liquid to exude therefrom, and to travel up the pipe to a similar set of bellows in the instrument itself on the dash, which, in turn, work a lever which actuates the indicator hand. The amount of pressure imposed upon the boxes or bellows varies in direct proportion to the speed

of the vehicle, and consequently the liquid assumes the same functions as a flexible shaft, but with the advantage that there is nothing in it to wear.



A corner of Mr. Jones's workshop, showing the water-cooled motor cycle engine (on the left), the case containing the football bladder, and the lathe with the home-made screw-cutting attachment.

BY THE SIDE OF CLUNIE LOCH, PERTHSHIRE.



The photograph was taken on the occasion of the second run for wounded soldiers organised by Dundee motor cyclists. The guests numbered eighty-five, and a few are shown in the above group of twin-cylinder Enfield-Jap sidecar outfits.



## TWO-STROKE ENGINES.

### Some Impressions of a Doctor serving on the French Front.

HAVING been a constant reader of *The Motor Cycle*, which I receive even in the first line, the writer has followed with interest all that has been written on the two-stroke engine. This type of engine has always interested me, and, being the first French motor cyclist to possess a two-stroke (Scott), I am one of those who have praised the qualities of two-strokes applied to the motor cycle in French motor cycle papers. Having, therefore, studied two-stroke engines for a long time, I am tempted to put my impressions on paper.

First, it appears that one of the great inconveniences of two-stroke engines is the great quantity of heat which they develop, and which does not evaporate quickly enough in the air when the engine runs slowly. Consequently even when changing speed it is impossible to make the engine revolve at full power on an incline, since the displacement of air is too small to disperse the heat, and the engine overheating, the sparking plug becomes incandescent and the machine stops.

I am surprised that so few manufacturers have attempted to establish cooling at a standstill without having recourse to water cooling. Although in the case of the Scott I have noticed how infinitely superior this engine is to the type without water cooling, I believe this system is too heavy. In addition many cyclists are afraid of the radiator and of leakages.

#### Fan Cooling.

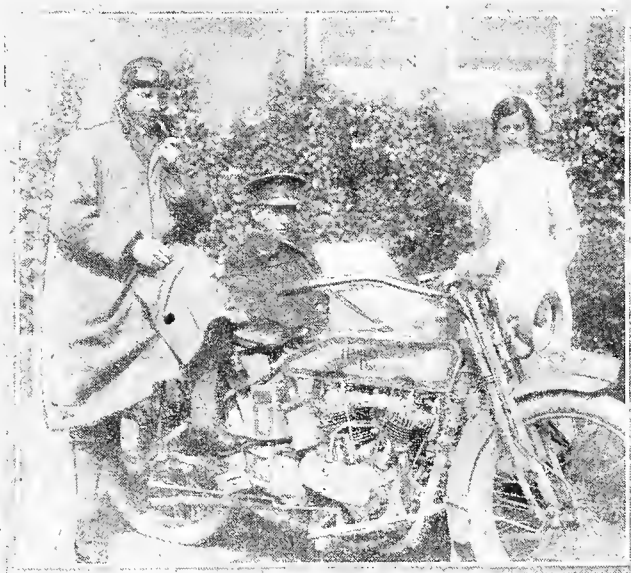
The gilled system of radiator, the Harcourt type, is very convenient, but there again displacement of air is necessary, and consequently it seems to me that it would be an advantage to fit two-stroke engines with ventilators worked by the engine itself. That would not present great difficulty, and besides one could completely close the engine and increase protection against mud without hindering cooling.

A ventilator would certainly be very efficient; trials have been made in France with perfect results. There would be something there to study, and I am sure that the practical English makers would arrive at a marvellous result.

From another point of view—the efficiency of the two-stroke—the great obstacle is the imperfect clearing out of the burnt gases, and the loss through the exhaust port of a part of the fresh gases. It seems to me that if the first quantities of compressed gas coming from the case were not explosive gases but pure air, this air would sweep out the cylinder better, and could escape by the exhaust without at all affecting the efficiency.

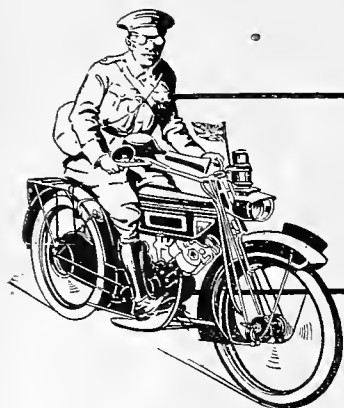
Some time ago [September 9th, 1915.—ED.] in *The Motor Cycle* there appeared a notice about an invention by the makers of the Paragon two-stroke engine, and at a low price. As I have not heard this system spoken of, I am recalling it, for it appeared good. It consists of putting upon the "transfer port" cover a valve to admit air, this valve being made by a piston rod with a limited stroke, and regulated by a screw. On the induction stroke the air entered by the valve, which was easily regulated in such a way that the transfer passage alone was filled. When the gases passed from the case to the cylinder, the first to enter was then pure air; this air swept away the burnt gases, cooled the cylinder, and served as a cushion between the burnt gases and the fresh gases, while preventing their mixture. It is evident that the regulation of the valve must vary with the speed of the engine, that is to say, pretty often, and it would be well to have a lever for this regulation at the handle-bar. It seems to me that this lever might have a great effect upon the control of the engine, and would allow of easy slowing down without fear of the unfortunate "four-stroking."

As soon as the war is finished I propose to try this system upon my new two-stroke. R. CAMUS.



#### A SIDECAR SCREEN REFINEMENT.

Canvas side flaps which, in conjunction with the scuttle and low glass screen, made the sidecar extremely comfortable and free from draughts. The outfit belongs to Mr. Jones, the Dundee Harley-Davidson agent; he is shown taking a wounded soldier for a run.



## MY DÉBUT ON A 7-9 h.p. SOLO.

### A TALE OF HILL-CLIMBING AND ADVENTURE.

By E. P. BURDETT,  
2nd Lt.

THE dog was the real reason why I bought the Harley-Davidson. Outside our camp is a nice little speed track, which is also, unfortunately, a main road. And that morning the powers that be, having previously warned us for the Front, had decided to send us to a certain detestable place whence escape is not for many months; but, relenting a moment, had granted us three days' leave before reporting. So there was every reason why I should be blinding down the road at a speed wholly out of comparison with the legal limit, on my tight little  $3\frac{1}{2}$  h.p. twin Matchless of uncertain age, to fill up with petrol at our favourite garage.

But love and war wait for no man. Whether it was love or war that controlled the antics of the two dogs concealed from my view by the cart at the side of the road I shall never know. But just as I drew level one of them sprang impetuously across the road, precisely into my front wheel.

I picked myself up about twenty yards on, having turned, I was informed by an eye-witness, and my own sensations confirmed, two complete somersaults in the air. I shook myself, miraculously undamaged. I limped to the spot where a crowd had collected round the heaving corpse: gathered that we were exonerated from blame: gathered that it was a prize dog, and somebody's only joy in life: and gathered that even the owners of the other mongrel wished it exterminated. The situation was beyond words, though not beyond tears on the part of many of the bystanders. I limped down to the garage and sent for the remains of the Matchless just in time to prevent the number being taken by a policeman.

#### The Deal.

After I had been bandaged up by the nearest doctor the position began to crystallise. The Matchless was intact ("some" frame), except that as we were somersaulting something had caught the rod of the hub gear, and yanked the gear suddenly into bottom, finally breaking the rod. At the speed we were going this had stripped half the pinions, and ghastly noises were audible from the hub. Consequently the bus was useless till parts had been obtained—and everyone knows what it is to get parts for Armstrong gears. Also, most insistent fact of all, I had three days' leave.

It is characteristic of great minds to make rapid decisions. There in the garage stood a great beast of a Harley-Davidson. I knew whose it was. S., one of my comrades-in-arms, had it for sale because he

was afraid of straining his heart in trying to start it. The garage proprietor wanted £55, but might take £50 cash. The Matchless was surely worth £35, even with the damaged hub. A rapid consideration of the situation at Cox's. "Would he take the Matchless and £20?"

With some persuasion he would. So I gave him a post-dated cheque, poor fellow, and left the tyres to be changed round, and most of the bolts holding the engine to the frame replaced.

Thus, at 10.15 next morning I started off to lunch with H. at an appointed hotel in Grasmere, which is eighty miles away. And it rained forty days and forty nights. At all events, all the way to Grasmere.

It was with some trepidation that I let in the clutch, as it was my first ride on any motor cycle of over 6 h.p., let alone solo on a wet day. However, I reflected that if I were killed I should certainly not go to the detestable place before referred to, which would be all to the good.

But T.T. bars and perfect balance soon give confidence, and I slushed through the mud at a speed which was never much below 30 m.p.h., for I regret to say that the untuned carburetter did *not* promise the 4 m.p.h. on top which we read about in the advertisements.

I paused for ten minutes in Preston in an unsuccessful attempt to buy sparking plugs, and then started on the fine stretch to Lancaster. In spite of the rain, this was in good condition: it is a road which never gets muddy. Then on to Kendal, which is a particularly greasy town in wet weather; and slowly, in fear of skids, on to Windermere and finally to Grasmere, where I arrived at five minutes to one—not too bad for a maiden ride. I found to my surprise that over this eighty miles I had used less than a gallon of petrol, which was just as well in view of the distinctly inferior tank capacity of the 1915 model; this, of course, has been improved in the 1916 tank.

#### Testing the Hill-climbing Powers.

H. rode a 1913 Rudge-Multi, and after lunch we set out to try our luck on the local test hills. Red Bank comes first on the list, and I had heard so much about the terrible gradient that I changed down to middle early on, as I had not thoroughly mastered the Harley gears, and dared not risk a sudden change down at the last moment. We sped up to the summit in fine style, and I could not help thinking that I could have done it on top, but on maturer reflection I doubt this. The Rudge got up all right in the end, but here and elsewhere was slowed by a slipping belt on low gear, due to a worn pulley.

We joined the Windermere road, and turned off at Ambleside for the Kirkstone Pass to Ullswater.

**My Debut on a 7-9 h.p. Solo.—**

There are two ways up Kirkstone; a comparatively easy way by Troutbeck from Windermere, and the steep ascent from Ambleside. The Harley again took the long gradient on middle, though we were all out in places, and I halted outside the Kirkstone Pass inn to watch the Rudge.

I never expected it to get up. But H. took the hairpin perfectly, and brought it up by very clever riding, moving the gear lever all the time to get a grip on the belt. The Rudge cylinder at the top was as cool as the Harley.

We went on to Ullswater, most beautiful of the lakes, and thence on to Penrith and Keswick, a splendid road all the way, and so back to our base at Grasmere, very well pleased with ourselves.

The next morning dawned fine, and we set out for Keswick, taking the prettier road to the left of Thirlmere. We left Keswick by Whinlatter Pass, past Derwentwater. The road surface here is terrible, and for the first time I used low gear in order to go slowly through the ruts. We turned off to the left at bottom, and rode past Crummock Water and Buttermere to the foot of the most famous hill of all—Honister.

**Up Honister Pass.**

The climb up Honister from Seatoller is a mere trifle to the Buttermere side. Nobody who wants long life from his tyres is advised to try the climb from Buttermere. The gradient is probably not much worse than Red Bank, and the length is not much greater, but the surface is entirely of loose pebbles, in which the wheels sink and cannot get a grip. I was climbing the hill on middle before I realised I had reached it. I came on the bad surface, and bungled the change down (on the Harley system the clutch must be taken right out before the gear lever can be moved). Before I had the gear in we were going backwards, and I only saved a fall by jamming on the brakes. The Rudge, better ridden, passed me, but soon came back again, and H. said that further on it was impossible.

However, I made a restart, and by throwing all my weight on the back wheel, climbed without much wheel slip to the steepest part, about a hundred yards from the summit. Here, on looking up, I saw an Arrol-Johnston coming down fairly fast with both back wheels skidding.

There was just room to run into the rock at the left-hand side, and the car just cleared me, the driver shouting out an apology as he passed. H. says the car got to the bottom in safety, but it must have taken good driving. When the car had passed I had to drop the Harley, which fell over sideways in the stones; but by and by two or three men came along and with vast exertions we lifted it and pointed it up the hill, and chocked the back wheel with an enormous stone. I

started the engine and let in the clutch very carefully. To my amazement the machine responded at once and moved up the hill, and we reached the top in style, amid cheers from the onlookers.

I rejoined the Rudge at the foot of the hill, and we went on to Cockermouth and back by Bassenthwaite Lake. On this trip the Harley averaged no less than 70 m.p.g.

**A Quick Return.**

All good things must come to an end, and next morning I set off back to camp. On the way misfiring began. The "Silent Grey" ran perfectly on the level at any speed, but up hills misfiring would set in, so that sometimes I could hardly get to the top. I was secretly pleased to find a flaw in the Harley's armour of reliability, and proceeded to dismantle the carburetter. It was an interesting task to examine the workings of the Schebler, but all my cleaning made no improvement. Suddenly I remembered an experience on a Calthorpe-Jap before the war. I investigated, and sure enough the porcelain of one of the sparking plugs was cracked. It is curious that this should give rise to misfiring on hills only, which generally makes one think of choked filters and low levels.

My little tour ended dramatically. I had to report at nine o'clock next morning, and for one reason and another did not leave the place where I stayed the night, 12½ miles away, till 8.41. The road is abominable, and there are eleven right-angled corners. But, spurred by thoughts of courts-martial, I blinded wildly all the way, just missing the hedge each time, and arrived triumphantly at 8.58. Average, 44.1 m.p.h.

I am now, alas, at the detestable place I have spoken of, but my Harley is down in the shed waiting for one kick—and then we shall see.



**TAKING A BADLY WOUNDED MAN FOR A SIDECAR RUN.**

Organisers of sidecar outings for wounded soldiers until recently have met with discouragement from medical men of some hospitals, who were not aware of the comfort of a sidecar. However, all this is gradually changing, and at the Dundee Eastern War Hospital the authorities gladly allow a badly wounded man to be taken for a run, as shown in the above illustration. He enjoyed it, too.



## FURTHER TESTS OF CHEAP FUELS.

### A Comparison between Binks Fuel and Petroleum.

HAVING given the results obtained during various tests with the new Binks fuel, we decided to carry out still further trials with a view to procuring some comparisons between this fuel and petroleum. Petroleum—or as it is generally, though incorrectly, called, paraffin—has certain disagreeable and harmful properties as a fuel when used in an ordinary carburetter, but it possesses one great advantage, in that it can be purchased almost anywhere. There are, therefore, many riders who hesitate to adopt the use of a fuel which must be purchased in bulk and sent by rail until thoroughly convinced that it is superior to ordinary paraffin or mixtures of paraffin and petrol, and thus the following tests may be of value.

#### Details of Test.

The trials were carried out over a circular route on good quality moorland roads, though high winds and severe gradients were encountered at intervals. A  $3\frac{1}{2}$  h.p. P. and M. with sidecar, carrying a total load of approximately 20 stone, was used, this machine being fitted with a Binks carburetter specially adjusted for the use of a heavy fuel. Cheap paraffin, having a specific gravity of .800, and containing a small quantity of heavy grade engine oil, was tried, and the results obtained were much in accordance with expectations. The following table gives the results obtained:

FUEL.	PRICE PER GALLON.	M.P.G.	M.P.H.
Binks fuel ... ..	1s. 3d.	83.2	26.4
paraffin $\frac{1}{2}$ Taxibus ... ..	1s. 9d.	78.4	22.6
paraffin $\frac{1}{4}$ Taxibus ... ..	1s. 4d.	76.9	22.1
Paraffin ... ..	1s. 0d.	76.8	22.1

Having completed the route on Binks fuel and carefully noted the running of the machine, we were then in a position to compare the performance of the fuels tried later, and with the half and half mixture of paraffin and Taxibus there was found to be very little difference in the running, except that the engine exhibited a certain sluggishness, and refused to "rev." on the level stretches. The exhaust lacked that sharp crack given with the Binks fuel, but the engine showed no increased tendency to knock, and the climbing was satisfactory.

On the third test, in which three-quarters paraffin and one quarter Taxibus were used, there was a very marked difference. It was necessary to resort to low gear with greater frequency, and those qualities usually described as "elasticity" and "silken running" were entirely lost.

On the final test with pure paraffin the engine became considerably overheated several times during

the circuit, and but for occasional favourable winds it would have been necessary to stop and cool off. Other tests with paraffin produced similar results, the engine beginning to show signs of distress immediately a head wind was encountered.

With the Binks carburetter, I have not as yet discovered that any excess of carbon deposit occurs when paraffin is the fuel used, but from the strong smell of petroleum smoke that issues from the exhaust on sudden load it would seem that liquid fuel gets down to the piston rings. That this causes harsh running and increased wear cannot be doubted, though the precaution of mixing heavy engine oil with the fuel may tend to equalise matters.

#### An Objectionable Feature.

A heavy fuel which will not vaporise at atmospheric temperature is bound to have one great drawback unless it be entirely odourless. If, for instance, any leakage takes place at the filler caps, the fuel percolates over the tank, gets on to one's overalls, and finally into one's clothing. Paraffin is most objectionable in this way, and the Binks fuel, though naturally not so clean as petrol, is certainly less offensive than paraffin.

With a heavy fuel of any kind, however, one must guard against spray from the air intake, as even though slight, this invariably occurs. The sketch shows a simple fitment on the Binks carburetter with which these trials have been carried out. A tin disc is cut to fit loosely over the thread of the plug enclosing the jets, and is held in that position by the thick leather washer. The edges of the disc are turned inward so as to cover the air holes, and this simple device not only protects the rider's legs from spray, but it also improves the consumption by creating an air cushion round the intake.

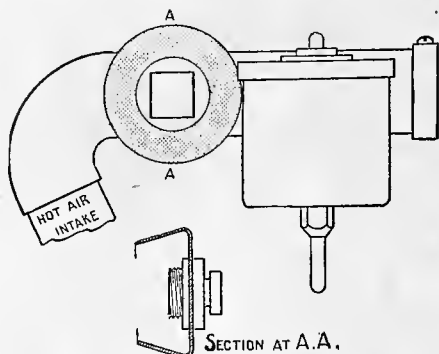
#### Binks or Paraffin?

The advantages of the Binks fuel would seem that, while presenting a very considerable saving in the fuel bill, it is not harmful to the engine, it produces a clean, sharp explosion, and is far from being so objectionable in use as paraffin, though certain disadvantages are inseparable from the use of a fuel with a high flash point. A 50% mixture of paraffin and petrol can

be made to yield reasonably satisfactory results, but there can be no doubt that a proportion of the paraffin is not used, and that its effect upon the engine is harmful. I cannot ascertain that this occurs with the Binks fuel, and the latter is not nearly so "messy" as paraffin.

H.M.B.

*This article should be read in conjunction with those appearing in "The Motor Cycle" of April 27th, page 399, and May 18th, page 465. The former gave the results of tests with petrol only and Binks fuel only on a Binks three-jet carburetter; the second article dealt with the same fuels, but used in conjunction with a single-jet carburetter.*



Binks horizontal carburetter, showing the tin disc (A) fitted to prevent petrol splashing from the air holes from reaching the legs of the driver. By creating an air cushion this also improves the consumption.

# "THE MOTOR CYCLE" RECRUITING SECTION.

M.M.G.S. and H.S. M.G.C. closed to Recruits until Further Notice.

Central Office for Heavy Section, Machine Gun  
Corps and Motor Machine Gun Service:

Mr. Geoffrey Smith,  
19, Hertford Street, Coventry.

Central Office for R.E. Despatch Riders:

Mr. T. W. Loughborough,  
A.C.U., 83, Pall Mall, London, S.W.

This section was instituted with the sole object of assisting readers and directing them to the many different branches of the Army and Navy, for which their special knowledge suited them. At the outbreak of war numerous letters reached us (and continue to arrive) from men at home and overseas possessed of motor engineering knowledge, explaining their difficulty in obtaining particulars of Specialised Sections (notably the Motor Sections), recruiting officers being invariably occupied by the demands of the line regiments. The Editor is Inspecting Officer for the M.M.G.S., Heavy Section, Machine Gun Corps, and R.E. Despatch Riders. Throughout, the work has been purely honorary, and Recruiting Commissions have not been accepted. To date 9,745 readers have taken advantage of our proffered assistance.

**T**HIS week Mr. Geoffrey Smith, Editor of *The Motor Cycle*, was to attend at the Recruiting Office, Coventry, on Tuesday, and at Manchester yesterday (Wednesday), to examine applicants for the H.S., M.G.C.

With this week's batch of recruits the Heavy Section Machine Gun Corps, as well as the Motor Machine Gun Service, closes to recruits until further notice, these sections now being up to strength. No doubt many letters of application will be in the post before this announcement appears in print, and instructions are being asked for from the recruiting authorities concerning them. In the meantime car drivers should note that the Army Service Corps (Motor Transport) has again opened for recruits.

Readers in possession of particulars of enlistment giving a date of inspection for next week will understand that the foregoing announcement—based upon a wire received from the Commanding Officer on going to press—cancels the appointment.

A list of recruits accepted in Coventry and London on Tuesday and Saturday last week respectively, is given below.

Allwood, G. H., Peterborough.  
Barber, J., Wandsworth.  
Bennett, W., Glasgow.  
Bentley, C., Sevenoaks.  
Bessant, F., Chesham.  
Bithrey, L. C., Golden's Green.  
Brennand, W., Kendal.  
Brereton, T. A., Liverpool.  
Brown, T. V., Benburo, Co. Tyrone.  
Burden, T. H., Coventry.  
Burhouse, G. E., Leeds.  
Butt, P., Chesham.  
Chesney, E. B., Battersea.  
Cook, J. P., Cannock.  
Cooper, F. P., Ipswich.  
Cooper, T. W., Chorlton-cum-Hardy.  
Coppack, J. C., Chester.  
Cummings, I. V., Romford.  
Dando, A. J., New Southgate.  
Dinwoodie, W. G., Blingie, N.B.  
Dooley, T., Folkestone.  
Dougby, F. W., Grimsby.  
Finch, T., Canterbury.  
Fisher, H. R., Battersea.  
Forrest, A., Planis, N.B.  
Frankland, F., Kendal.  
Fuller, G., Faversham.  
Garbutt, R. J., Coventry.  
Garne, A., Durban.  
Godhold, E. J., Southfields.  
Goodall, W. A. J., Darlington.  
Gosling, S. O., Framlingham.  
Grant, S. D., Durham.  
Green, H., Leicester.  
Green, J. C., South Farnborough.  
Gregg, C., Cleator Moor.  
Greenwood, F. H., Wolverhampton.  
Hazel, A., Waterbeach.  
Henderson, W. R., Stockport.  
Hill, E., St. Albans.  
Hitchings, Glamorgan.  
Holmes, W. G., Blingie.  
Honeysett, B. G., Stockport.  
Hughes, C. E., Finchley.

Hyman, W., Swansea.  
Kent, A., Burslem.  
Kiddell, A. V., Birmingham.  
Lake, K., Eastbourne.  
Langton, L., Morecambe.  
Last, E., Brindon.  
Lee, W. H., Saltley.  
Linsler, A., Leeds.  
Llewellyn, L. C., Brighton.  
Loseby, W. H., Retford.  
London, P., Walthamstow.  
Mackie, C. R., Derby.  
Mansell, F. G., Shrewsbury.  
Marriott, W., Egremon.  
Martin, D., Westcliff-on-Sea.  
McLellan, W., Fraserburgh.  
McLoughlin, J. J., Cahel Co. Tipperary.  
Merriman, C. E., Manor Park.  
Monkman, E. F., York.  
More, U. H.  
Morris, S. J., Salisbury.  
Nicolson, A., London.  
Nowers, R. A., South Croydon.  
O'Mahony, V. L., South Farnborough.  
Parker, J., Thornton Heath.  
Parkin, C., Rotherham.  
Parkinson, A. E., Wembley.  
Ratcliff, A. E., Birmingham.  
Relly, C. H., Eastbourne.  
Ritchie, G. W., Newcastle-on-Tyne.  
Ross, S. J., St. Neots.  
Rorke, W. S., Spalding.

Sargent, J. J., Rosyth.  
Sealey, A. F., Redditch.  
Sherman, E. R., Wadstone.  
Smale, H. H., Plymouth.  
Smith, S. H., Thanington.  
Snencer, S. N., Hendon.  
Stevens, I. C., Chelsea.  
Stott, F., Burnley.  
Sutton, H., Tottenham.  
Thwaites, E., Eastbourne.  
Turrell, W. L., Warwick.  
Tutty, A. E., Wellingborough.  
Warren, F., Hindon.  
Watts, H., Aldershot.  
Weakley, J. F., Westcliff-on-Sea.  
White, H. A., Reading.  
Wilkins, R. R., Aale.  
Williams, E. H., Chiswick.  
Wilson, A., Dewsbury.

Several men lately employed at the Royal Aircraft Factory are now in training at the M.G.C. camp.

Among the Colonials who have recently been accepted for the H.S., M.G.C., are W. S. Royce and S. D. Grant, of South Africa, who paid their own passage home.

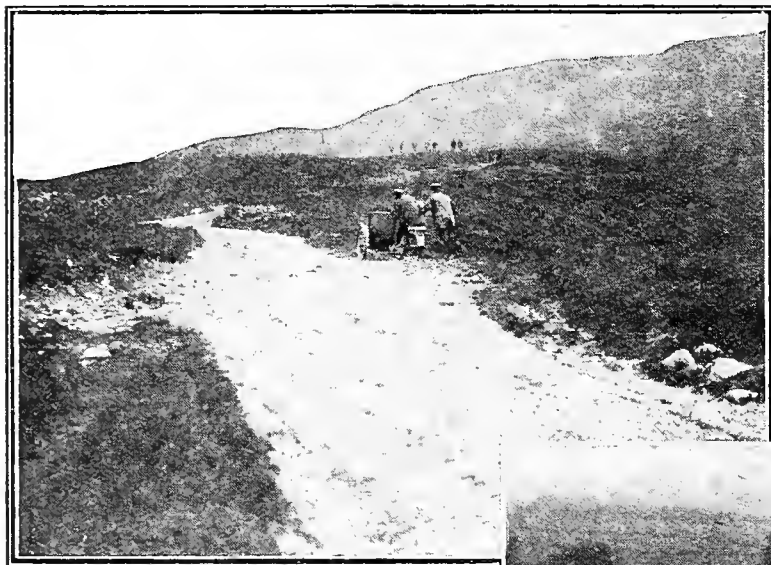
## AVERAGE PRICES of SECOND-HAND MACHINES.

From "THE MOTOR CYCLE" of June 1st.

Make.	Year.	H.P.	Average for last week.	Latest weekly average obtainable.	Make.	Year.	H.P.	Average for last week.	Latest weekly average obtainable.
A.J.S.	1915	6	3-sp. sidecar	£23	James	1915	4 1/2	3-sp. sidecar	£56
"	1914	6	3-sp. sidecar	£63	"	1915	2 1/2	2-sp. 2-stroke	£25
"	1913	6	3-sp. sidecar	£63	"	1914	4 1/2	3-sp. sidecar	£44
"	1915	2 1/2	3-speed	£47	Levis	1915	3	Popular	£23
"	1914	2 1/2	3-speed	—	"	1914	2	2-speed	£22
Allon	1916	2 1/2	2-stroke	£39	Matchless	1915	8	3-sp. sidecar	£78
"	1915	2 1/2	2-stroke	£24	"	1914	8	3-sp. sidecar	£77
Bat	1915	8	3-sp. sidecar	£70	Motosacoche	1913	3 1/2	2-speed	£27
Bradbury	1914	6	3-sp. sidecar	£48	New Hudson	1915	2 1/2	2-speed	£26
B.S.A.	1916	4 1/2	3-speed	£57	"	1911	6	3-sp. sidecar	£44
"	1915	4 1/2	3-sp. sidecar	£58	New Imperial	1916	2 1/2	2-speed	£34
"	1915	4 1/2	3-speed	£46	"	1915	2 1/2	2-speed	£27
"	1914	4 1/2	3-sp. sidecar	£49	New Kyder	1915	2	2-speed	£27
"	1914	4 1/2	3-speed	£43	O.K.	1915	Junior	2-speed	£25
Calthorpe	1915	2 1/2	2-speed	£27	P. & M.	1914	3 1/2	2-sp. sidecar	£57
"	1914	2 1/2	2-speed	£76	"	1913	3 1/2	2-sp. sidecar	£37
Campion	1915	2 1/2	2-stroke	£21	Premier	1914	2 1/2	3-speed	£20
"	1914	6	sidecar	£51	"	1914	3 1/2	3-sp. sidecar	£46
Clyno	1914	6	3-sp. sidecar	£48	Rex	1914	6	2-sp. sidecar	£43
Douglas	1915	2 1/2	3-speed	£45	"	1913	6	2-sp. sidecar	£34
"	1915	2 1/2	2-speed	£46	"	1915	3 1/2	3-sp. sidecar	£50
"	1915	2 1/2	T.T.	£41	"	1914	3 1/2	3-sp. sidecar	£42
"	1915	4	3-sp. sidecar	£66	"	1915	3	T.T.	£43
"	1914	2 1/2	2-speed	£36	"	1915	3	T.T.	£43
"	1914	2 1/2	2-sp. T.T.	£37	Royal Ruby	1915	2 1/2	2-stroke	£27
Enfield	1916	6	2-sp. sidecar	£87	Rudge	1914	3 1/2	multi sidecar	£44
"	1915	8	2-sp. sidecar	£71	"	1914	3 1/2	multi	£37
"	1915	2	2-sp. sidecar	£69	"	1914	5-6	multi sidecar	£40
"	1914	6	2-sp. sidecar	£60	Scott	1915	3 1/2	2-sp. sidecar	£50
"	1915	3	2-speed	£42	"	1914	3 1/2	2-sp. sidecar	£18
"	1914	3	2-speed	£34	"	1913	3 1/2	2-sp. sidecar	£34
Excelsior (A)	1915	7	3-speed	£50	Sunbeam	1915	3 1/2	3-speed	£60
H.-Davidson	1915	8	3-sp. sidecar	£66	"	1914	6	3-sp. sidecar	£79
"	1915	4 1/2	2-speed	£44	Triumph	1915	2 1/2	2-sp. 2-stroke	£37
Hobart	1915	2 1/2	2-stroke	£23	"	1914	4	3-speed	£38
Humber	1913	3 1/2	2-sp. sidecar	£26	"	1914	4	3-sp. sidecar	£51
Indian	1915	7	3-sp. sidecar	£73	"	1913	3 1/2	3-speed	£33
"	1915	5	3-speed	£54	"	1913	3 1/2	3-sp. sidecar	£42
"	1915	5	3-sp. sidecar	£60	Williamson	1914	8	2-sp. sidecar	£73
"	1915	3 1/2	3-speed	£49	Wolf	1915	4	sidecar	£43
"	1914	7	2-speed	£42	Zenith	1914	6	Gradua sidecar	£48
"	1914	7	2-sp. sidecar	£57	"	1913	8	Gradua sidecar	£52
"	1914	7	T.T.	£36	"	1913	6	Gradua sidecar	£36

## CLIMBING BLEA TARN.

ANOTHER EXPEDITION BY MUNITION WORKERS. AN OLD A.C.U. TERROR.



SCENES ON BLEA TARN PASS DURING THE BARROW MUNITION WORKERS' VISIT.

(Above) E. H. P. Scantlebury ( $3\frac{1}{2}$  h.p. Sunbeam sidecar) takes to the grass.

(Right) The best climb was made by R. Boyren, who is seen making his ascent on the  $2\frac{3}{4}$  h.p. Douglas. This picture gives a good idea of the rough surface.



LOOKING DOWN THE LOWER HALF OF BLEA TARN.

I. Wardle ( $2\frac{1}{4}$  h.p. two-stroke Federation) coming to grief.

**F**OLLOWING on the successful munition workers' Lakeland hill-climbing expedition, reported in our last issue, was another the following Saturday, when Blea Tarn Pass was the venue. The proceedings described last week, it will be remembered, dealt with Stoneythwaite Rake and Walna Scar. Nine riders started, the majority coming from Barrow.

Blea Tarn is roughly a mile in length. Commencing at Wall End Farm, the gradient is about 1 in 8. It gradually becomes steeper until, at a bad S bend, it is about 1 in 6. The surface is very loose, and the combination of this and the gradient called for great skill.

Only three men reached the summit—R. Boyren ( $2\frac{3}{4}$  h.p. Douglas), W. Taylor ( $3\frac{1}{2}$  h.p. P. and M.), and G. Dudson ( $3\frac{1}{2}$  h.p. Rudge). The finest climb was made by Boyren, who made two ascents.

Of the others who attempted the climb, J. Wardle ( $2\frac{1}{4}$  h.p. two-stroke Federation) made two excellent tries.

The rider of a  $3\frac{1}{2}$  h.p. twin-cylinder Indian made a plucky attempt, but later on got into difficulties, and was obliged to withdraw. The rider of a  $2\frac{3}{4}$  h.p. A.J.S. distinguished himself by getting into the ditch; he started again, however, on a very bad stretch by the use of his clutch.

There were two sidecar outfits, but neither succeeded in reaching the S bend. E. H. P. Scantlebury, driving a  $3\frac{1}{2}$  h.p. Sunbeam sidecar without passenger, made a good attempt, being able to drive partly on the grass at the side.

# A CENSUS OF PETROL AND A CENSUS OF MOTOR VEHICLES.

## Latest Developments of the Petrol Supply Question.

**D**EFINITE steps have now been taken by the committee appointed by the Board of Trade to enquire into the supply and distribution of petrol. These consist in the decision to take a census of petrol to be followed by one of motor vehicles. With regard to the former, under the Defence of the Realm Act every person who uses or keeps motor spirit, whether for the purpose of supplying motive power for motor cars, or for any other purpose, must supply such information in relation to the motor spirit used or kept by him, and the purposes for which and the manner in which it is used or kept by him, as the Board of Trade may by any general or special order require, giving such particulars in such form and at such times as the Board of Trade may by order direct. If any person fails to comply with this regulation or any order made by the Board of Trade thereunder, or knowingly give, any false information, he shall be guilty of a summary offence against these regulations.

Following the foregoing came the announcement that it is the intention of the Petrol Control Committee shortly to take a census of motor vehicles. In the meantime a sub-committee, consisting of representatives of the chief distributing organisations, has undertaken at the request of the Committee to regulate the supply of petrol according to the classification shown below. The items in each class are arranged in alphabetical order. It is not anticipated that there need be any curtailment at present of reasonable demands in Classes A and B.

### Order of Priority for the Distribution of Motor Spirit.

**CLASS A** includes requirements for or by carriage of munitions of war or materials for munitions of war; fire brigades and ambulances; Lords

Lieutenant, High Sheriffs, and any services certified by a Government Department to be essential; medical practitioners; motor cars used by or under the authority of the Red Cross Society or the St. John Ambulance Association or any other society approved by the Admiralty or Army Council for the conveyance of wounded or sick members of any of His Majesty's forces; police and local government authorities; veterinary surgeons.

**CLASS B** includes requirements for or by agricultural machinery; aircraft; conveyance of goods; industrial processes; motor cabs plying for hire; motor cars used by commercial travellers for business purposes; motor fishing, cargo, and passenger boats other than boats running pleasure services; motor omnibuses, excepting those running pleasure services; railway companies; stationary engines (including lighting sets).

**CLASS C** includes all requirements not covered by Class A or Class B, such as chais-a-bancs and other passenger vehicles running pleasure services; motor boats running pleasure services; motor cars standing for hire in garages, livery stables, hotels, etc.; private motor cars and motor cycles in ordinary use.

Meanwhile the agitation being conducted against "pleasure" motoring by a certain section of the press has somewhat relaxed. There was an excellent letter in *The Times* of last Friday on the petrol supply question, which concluded as follows: "The Government have, I believe, asked the Army Service Corps whether they can suggest any means of economy. This is like asking the wolf if he can account for the disappearance of the sheep."

This is sound commonsense.

Pleasure motoring has been necessarily curtailed to an enormous extent; to forbid it altogether would be a national disaster, and one which the Germans would vociferously acclaim as a victory, while the neutrals would be by no means favourably impressed. The so-called pleasure motoring, which brings health to the town dweller, perhaps once, or at the most twice, a week, is a very necessary asset. To stop its use hinders the development of the motor vehicle, which has so strenuously served the country during the present crisis. We are sure that if it is absolutely necessary no single motorist will object to sacrificing his pleasure for his country's good, but he would like to know first that petrol is not wasted in the Services, and that there is an actual shortage of the precious spirit at the present time.

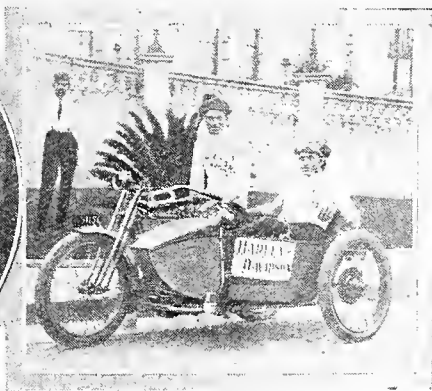
## AN AMERICAN DUEL IN NATAL.

**T**WO keen Durban motor cyclists, one the possessor of a Harley-Davidson sidecar and the other of an Indian sidecar, decided to put their machines to a thorough test. This took the form of a 214 miles road race, starting and finishing at Durban, touching Maritzburg and Ixopo. We are told that the route included every variety of Natal road, though the worst was in the majority. Many streams had to be crossed, but punts conveyed the two competitors across the larger and deeper rivers.

The Harley-Davidson man started from the Durban Town Hall at 7.45 a.m. on April 30th. A quarter of an hour afterwards his Indian rival started. The latter arrived back at 3.38 p.m., being followed by the Harley-Davidson at 3.42 p.m. Thus the Indian, driven by Jordan, won by 19m.—a very close finish for a 214 miles Colonial road race. The Indian average works out at 28 m.p.h., that of the Harley-Davidson at 26.9 m.p.h.

## PETROL FOR WOUNDED SOLDIERS' OUTINGS.

**A**T a meeting last week of the Leicestershire Automobile Club the committee decided to communicate with the Petrol Supply Committee asking if outings for wounded soldiers would be in conformity with their recommendations in connection with the restriction of petrol supply. Meanwhile it would appear that there should be no difficulty in obtaining petrol for such outings, as the new order of priority for the distribution of motor spirit puts in the first class "motor cars used by or under the authority of the Red Cross Society or the St. John Ambulance Association or any other society approved by the Admiralty or Army Council for the conveyance of wounded or sick members of any of His Majesty's Forces."



Indian and Harley-Davidson riders who raced over 214 miles of Natal roads, the former winning by nineteen minutes at an average speed of twenty-eight miles an hour. Note the sidecar wheel brake on the Harley-Davidson.





## TIME TO LIGHT LAMPS

"SUMMER" TIME.

June 8th	...	...	9.42 p.m.
" 10th	...	...	9.43 "
" 12th	...	...	9.44 "
" 14th	...	...	9.46 "

### American Export Trade.

The American export trade in motor cycles continues to boom. In February last 1,689 machines were exported, as against 724 for February, 1915.

### A Kind Action.

A parcel of eight razors reached us last week by registered post from Mr. C. M. Dewey, Hotel Chelsea, West 23rd Street, New York, in response to the appeal recently published at the request of Mr. Harry Smith, managing director of the Rover Co., who is collecting old razors for the troops.

### A Petrol Tax Only.

Abolish the new taxes and put an additional tax on petrol alone seems to be the most favoured system, according to our post bag. At present, no matter whether a man uses 500 miles of roads in a year or 5,000, the tax is the same. Road damage, too, would be automatically adjusted, as the heavier vehicle naturally consumes a much greater quantity of fuel.

### Importation of Enemy Goods into Australia.

Last December the Commonwealth Government prohibited the importation into Australia of "goods manufactured or produced in, or brought directly or indirectly from, an enemy country," except by special permission. This has now been modified to the extent of permitting the importation of goods which were in the United Kingdom before the outbreak of war with the country in which the goods were produced.

### Grievances of Colonial Buyers.

We were chatting the other day with a motor cyclist who has recently returned home after a five years' stay in one of our Overseas Dominions. The conversation turned to the Overseas trade and the complaints of the Colonial motor cyclists that are so often voiced in the columns of *The Motor Cycle*. Our friend is inclined to take a different view from that usually adopted, his experiences, he told us, leaving him to believe that the Colonial always wanted "something for nothing." He suggested that the average Colonial buyer would be capable of asking the manufacturer what he would allow off the price if he took a coat of enamel off! Needless to say, we do not share the erratic views of our friend.

## SPECIAL FEATURES

A MODERNISED TRICYCLE. MY DEBUT ON A 7.9 h.p. SOLO.  
TWO-STROKE ENGINES.

### Liverpool Motor Cyclist Volunteers.

Mr. S. W. Phillpott tells us that as a result of the paragraph in *The Motor Cycle* last week, mentioning the existence of vacancies in the motor cyclists' section of the Port of Liverpool Heavy Car Battalion of the National Motor Volunteers, he has "been flooded under with applications from all over England." Some people, however, still do not understand that the National Motor Volunteers is a purely volunteer organisation, and that men eligible for the Army cannot be accepted. Only men living in the Liverpool district can join the Liverpool section, but that other sections are being formed in various parts of the country.

### The Ruling Passion.

Dr. Aubrey Harris sends us the following true story, the experience of a lady patient who visits one of the military hospitals. A certain D.R. out in France came into collision with a motor lorry, and came off decidedly second best. He is in a London hospital suffering from a smashed face, a bunged-up eye, a broken arm, and a broken leg. The lady was talking to him, and on saying good-bye asked him if there was anything she could get him which he particularly desired. "Oh, yes," was the immediate response, "if you could get me a copy of *The Motor Cycle*!" His injuries had apparently not damped his keenness.

### The Penalty for Warning Motorists.

A despatch rider has recently been doing good for the cause by warning motorists of police traps. A trap was working on Kingston Hill recently when the despatch rider took up his position in the centre of the control, and waved his arms in warning to drivers of three cars which were being timed. The constable said that as the man was a soldier he did not take proceedings until his conduct in warning motorists became intolerable. The despatch rider was confident that he could not be summoned for warning motorists. He was proved to be wrong, however, and as two speed convictions were proved against him he was fined £7 12s. 6d., including costs. He evidently was unaware that it has been proved to be illegal to give warning of a police trap if the person concerned is apparently exceeding the speed limit while in or when immediately near the control.

The prevention of crime is, in this case, a crime in itself!



FLAGS WERE SOLD IN LONDON YESTERDAY TO PROVIDE SMOKES  
FOR SOLDIERS AND SAILORS.

Miss Lottie Berend, a well-known lady motor cyclist who has ridden in many competitions, is driving the Powerplus Indian. Standing on the pillion seat is the Hon. Judith Denman, daughter of Lord and Lady Denman, Miss Yoskyl Pearson is sitting on the back of the sidecar, and Miss Tyrhitt Drake is in the sidecar.

**Economy and Utility—**

the keynotes of the motor cycle—will be dealt with in all their aspects in a special number of *The Motor Cycle*, to be published on Thursday, June 29th. Convincing evidence of the value of a sidecar to the small tradesman will be included.

**Bristol Wounded Soldiers' Run Abandoned.**

Sec.-Lt. H. Smith informs us that the proposed Whit-Monday picnic for wounded soldiers that had been arranged by the Bristol Motor Cycle Club has been abandoned, owing to the postponement of the Whitsuntide holidays.

**The National War Funds.**

At the week-end the principal war funds stood as follow:

The Prince of Wales's National Relief Fund	£5,318,000 distributed		
Fund for the Sick and Wounded	£5,899,309	0	0
Tobacco Fund	3,757,059	0	0
The Queen's Work for Women Fund	107,561	0	0
Fund .. .. .	169,504	8	4

**Motor Cycle Thieves.**

The motor cycle thief continues to put in an appearance at intervals. In the latest instance brought to our notice he has brought off a good haul in the form of a 1915 Matchless sidecar. The engine number is 2/cix. 34,480, under front cylinder; frame No. C2,965, on lug under saddle. The sidecar is a Montgomery. The rightful owner, Charles Symonds, 85a, Haverhill Road, Balham, S.W., is offering a reward for information leading to its recovery.

**Don't Offer Money to a Policeman.**

An officer, attached to the M.M.G.S., who had been riding a motor cycle without a licence, was charged at Woking with attempting to bribe the police. The charge was dismissed.

**Naphtha as a Fuel.**

In answer to a letter published last week on the use of naphtha as a fuel for motor cycles, a correspondent tells us that he has used this fuel with success on a 3½ h.p. Triumph with a B. and B. variable-jet carburetter. He obtains a better mileage per gallon and more power, while starting is quite as easy as with petrol.

**Tests of Petrol Substitutes.**

Following upon our tests of "Spots" on different types of machines, readers of *The Motor Cycle* relate in this issue their experiences.

The cheap fuel problem has received much attention at the hands of this journal, tests having been made of all promising petrol substitutes and energisers, and the results detailed for the benefit of over-taxed readers.

**A Failure of Brakes.**

On Saturday afternoon an accident of a rather serious character occurred on Road Hill, Congleton, Cheshire. It appears that an insurance agent was proceeding down the hill with a sidecar, occupied by a lady, attached to his motor cycle, and another young lady on the carrier. At the top of the hill the driver noticed the danger-post, and shut off his engine and applied his brakes, which, unfortunately, failed to operate. On reaching a bend in the road the machine was going at a furious rate, and was absolutely out of control, with the result that he dashed across the road and collided violently with a stone wall on the other side. The driver sustained a fractured thumb. The lady on the carrier was seriously injured, and conveyed to a local hospital suffering from hemorrhage. The sidecarist luckily escaped with a few scratches and bruises.

**How to Grease a Chain.**

As we were going to press we received a letter from the Coventry Chain Co., Ltd., deprecating the use of boiling grease as a lubricating bath for motor cycle chains. This letter will appear in our next issue.

**Sydney-Melbourne Motor Cycle Record.**

News is expected any moment that J. Booth, the well-known Australian rider of Indians, has put up a record for the Sydney-Melbourne run. The distance between the two State capitals is 570 miles. The present record is, by motor cycle, 23h. 41m.

**Notice to Recruits.**

Recruiting for the Machine Gun Corps, Heavy Section, as well as the Motor Machine Gun Service, has now closed for the time being. The announcement is made on our Recruiting section page this week, the official notice being sudden, as usual.

**Sidecarring in Mexico.**

An American journalist has been following the Mexican campaign by means of a sidecar outfit. One run in particular from El Paso to the U.S.A. Army Base at Casas Grandes was very trying for both rider and passenger. The "roads" were awful, there being a plentiful supply of rough ruts and grass roots.

**The Petrol Question.**

Latest news concerning the petrol supply will be found on page 541. From this it will be seen that the Petrol Control Committee has decided to take a census of petrol, and also one of motor vehicles. In the meanwhile, all types of engines (road, marine, and stationary) using petrol have been divided into three classes for an order of priority for the distribution of petrol.

**Petrol Substitutes.**

A correspondent tells us that he has two ideas for the production of fuels which should, in time, take the place of petrol. One process would necessitate the design of a smaller and stronger engine, but the second would require minor alterations only. The supply of raw material is abundant. Our correspondent is anxious to meet with some firm who would test these ideas, and place the spirit on the market in quantity.

**Newcomers to the Pastime.**

It has on several occasions been stated that the good work of motor cyclists at the Front will be the means of attracting non-motor cyclists who are at present stationed in France to the joys of motor cycling after the war. Our post bag would confirm such a view, as enquiries already reach us from non-motor cyclists at the Front who desire information concerning machines of which they hope to take advantage in happier days. This week we received a letter from a member of a French Artillery Company, enquiring for details of the Phelon and Moore motor cycles, mentioning that he has seen such a machine during the stay of the English troops in his town, and is pleased with its silence, softness, and reliability. "It is almost unknown on the French market," he adds—a fact only too true, but which will no doubt be remedied ere long.



Sergt. W. E. Southcomb May, late hon. secretary of the Motor Cycling Club, who has been in the Motor Machine Gun Section for nearly twelve months.

## RIDING POSITION.



MOTOR BICYCLING HAS OFTEN BEEN LIKENED TO RIDING ON HORSEBACK, AND DRIVING A CAR TO DRIVING A HORSE AND TRAP.

An interesting comparison is afforded by these two pictures—the upper one a remarkable view of a Triumph tester and the lower one that of a rider on a typical hunter.

Which appeals to you?



## THE LATE SIR R. K. ARBUTHNOT.

Our Keenest Amateur Rider gives his Life for his Country.

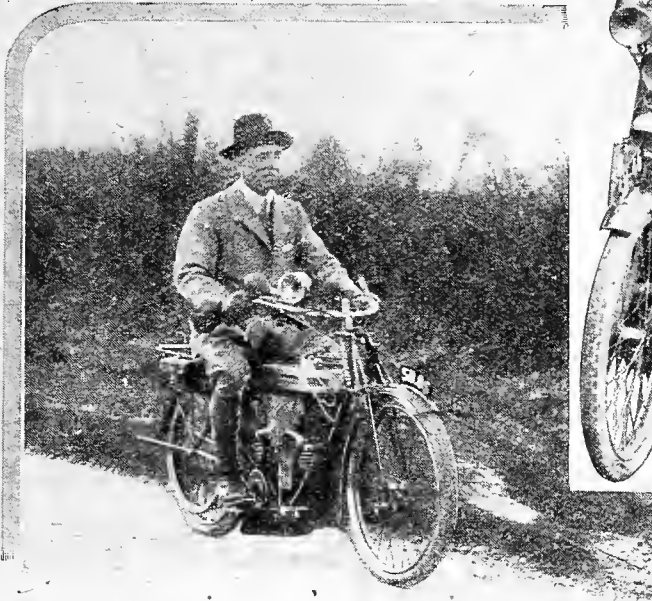
THE whole British motor cycle community will mourn the loss of one of its most distinguished members, Rear-Admiral Sir Robert Keith Arbuthnot, Bart., C.B., M.V.O., who perished with all his brother officers in the *Defence* in the great naval battle. He was fifty-two years of age, had seen nearly forty years' service in the Navy, and was one of our most able senior officers. By a sad irony of fate his name appeared in the Birthday Honours list as receiving the order of Companion of the Bath simultaneously with the announcement of the loss of his gallant ship during its first encounter with the enemy. No better all-round sportsman ever rode a motor bicycle. He thought cars only fit for women and invalids, and considered that the sidecar spoilt a motor bicycle. Sir Robert's affections were purely for the fast solo mount.

Few people realise what he did for the movement, but that he did it an enormous amount of good is an undoubted fact. He became a devotee just at the time when motor cycling needed all the encouragement it could get. He popularised the sport in the Navy, and what was good enough for the Navy

take the youngsters ashore for a spin, and they had to be good riders and smart on corners to keep up with their admiral.

### As a Trials Competitor.

As a motor cyclist he did great deeds. His finest performance was to come in third in the T.T. race in 1908, no mean feat for an amateur. He never missed an Edinburgh run, and his 1911



Triumph won him a gold medal three years running in this event. He competed in numerous A.C.U. Six Days trials, and in 1912, when he was too late to enter, he acted as an official to that body, of the committee of which he was as active a member as his heavy duties would allow. He was an excellent sportsman, and would never dispute the ruling of the judges in any competition. He was a fearless but careful driver, and a man of

*Wishing Motor Cycle*

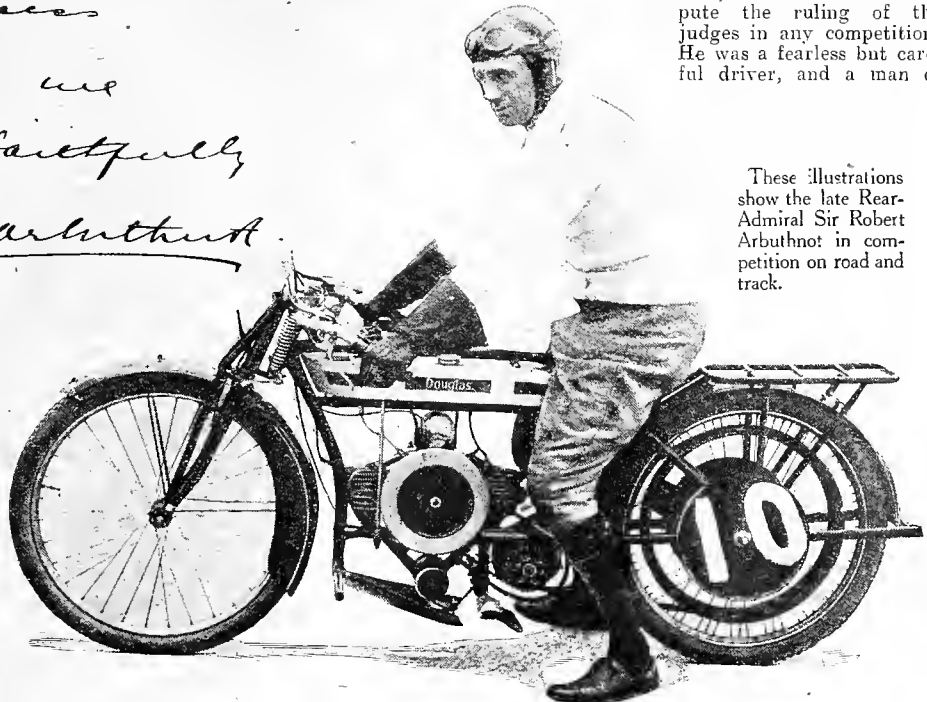
*Every success*

*Believe me*

*Yr. faithfully*

*R. Arbuthnot*

was good enough for the Army, and what was good enough for the Services was good enough for the man in the street. It was said at one time that no officer in Sir Robert's ship had a chance of getting on unless he rode a motor bicycle; that was, of course, a libel, as the gallant admiral was keener on their efficiency as officers than anything else. Naturally, however, he collected kindred spirits around him. In peace time he rarely sailed without both his Douglas and Triumph on board, and he would dearly love to



These illustrations show the late Rear-Admiral Sir Robert Arbuthnot in competition on road and track.



### The Late Sir R. K. Arbuthnot.—

few words, but one who was not afraid to speak his mind no matter what the cost. Among those who had the honour of competing with this very gallant gentleman he was extremely popular, but in the Navy, though everyone respected and admired him, few loved him. He was a martinet of the old school, who lived solely for efficiency in his ship, and though severe he was just.

Sir Robert Arbuthnot never sought advertisement. He was proud of his achievements on his motor bicycle, but would have been just as happy if they had never been recorded. Not many months ago a paragraph appeared in *The Motor Cycle* stating that despite the war the admiral found time for a few spins ashore on his favourite Triumph. This resulted in a gentle reprimand in which the sailor pointed out that during war time his exploits ashore were best left unpublished. Many times did he do kind actions to motor cyclists. When the *Lord Nelson* was first commissioned he entertained members of the Newcastle and District M.C.C. aboard her, and when as Rear Admiral he hoisted his flag on the super-Dreadnought *Orion* he invited members of the M.C.C. to view this splendid ship during their Easter tour in 1914, when she lay off Weymouth.

Though since the war Sir Robert has been too much occupied in other directions to devote attention to his motor cycle, he has kept in touch with the movement and its developments through the medium of *The Motor Cycle*, of which he assured us he was a regular and keen reader.

We have lost a dear and valued friend with whom we have spent many joyous days both in England and France, and also one glorious week-end at sea. The nation can ill-afford to lose such men as he, who died as he would have wished with his face to the enemy, his beloved ship his coffin, and the boundless ocean (on whose bosom he had spent his life) his grave. To Lady Arbuthnot and his little daughter we extend our heartfelt sympathy.

### Some Anecdotes.

We were on the bridge of H.M.S. *Orion* when one summer's evening (about six weeks before war broke out) at 5.45 she sailed with three other super-Dreadnoughts from her base. No signals were made, but to the very second the four great ships weighed anchor, and left in line ahead. But not all. One was a long time in going about. We noticed it, and on calling the Admiral's attention he became instantly alert, and said, "Shall I signal 'My guest points out you are not keeping station'?" "Please don't," we replied. But the Admiral would never overlook an incident of this kind, and the signal went through, but, fortunately, our part in the incident was left out.

At eight o'clock the following Sunday morning he was on the bridge having a look round, and the fact that a "snotty" in charge of one of the sailing boats was on the point of making shore with his sail set in a slovenly fashion did not escape the Admiral's eagle eye.

One morning, while we as guests were the only idle persons in the ship and time

hung heavily on our hands for about half an hour, we fitted a valve to the Admiral's Douglas. Towards the end of the procedure the Captain came in the cabin much amused at our method of occupation. "I call that a real 'busman's holiday,'" he said.

Sir Robert Arbuthnot was an all-round sportsman. He was keen on all forms of exercise. Boxing, cricket, football, and golf were all hobbies of his. He recently ran 100 yards against the late Capt. Back, who was some years his junior, and he took to the motor cycle comparatively late in life. His aim was efficiency in all things, and when his midshipmen carried off a cup in the 1914 regatta at Weymouth he was as pleased as if his ship had won a coaling or gunnery record.

### A Secret Unfolded.

There is no doubt that the leaders of the German Navy had a particular grudge against the late Admiral Sir Robert Arbuthnot. It was at the Auto-Cycle Union dinner in 1910 that he made a very eloquent speech, spoken in his usual bluff sailor manner, straight from the bottom of his heart, a talk directly to the motor cyclists present and one which he never intended to be reported in detail. He told how riding a motor bicycle braced the nerves and sharpened the wits, and how it helped him to command a first-class battleship. There was a general election on at the time, and he did not hide his political views. He pointed out that the German Emperor, ever since he came to the Throne, had been plotting against England, and that he meant war, and that the war would be terrible, short, sharp, and decisive, and if we wished to avoid it the best way to do so was to keep out the party with which he had no sympathy and support the other, which would ensure our having a large navy. *The Motor Cycle* did not report that speech in detail, but, unfortunately, sitting next to us was a representative of a daily paper, which printed every word of the speech, with the result that the German Ambassador made a special representation to the King on behalf of the German Empire, so that Sir Robert was dismissed his ship and placed on half-pay. That such a brilliant officer should remain long in such a position was, of course, impossible to conceive, and so he was given a brief holiday, most of which was spent on his faithful Triumph, and then was appointed to a Submarine Committee.



### A NOVEL HEAD PROTECTOR.

The type of head protector illustrated is intended to be worn inside the ordinary cap. The illustration shows the head protector without the cap and also with the cap in place for use in bad weather. It will be noticed that the eyes are to some extent shielded, and that the protector also extends down the back of the neck, performing an extremely useful function.

### THE BIRTHDAY HONOUR LIST.

AMONG the long lists of names figuring in the King's birthday honours we notice those of several well-known people in the motor cycle world:

ORDER OF THE BATH, C.B.—The late Rear Admiral Sir R. K. Arbuthnot, Bart., M.V.O.; some details of his career appear on this and the preceding page.

The Hon. Arthur Stanley, M.V.O., M.P., president of the Auto Cycle Union.

To be a BARONET of the United Kingdom.—Mr. Arthur Philip DuCros, M.P., chairman of the Dunlop Rubber Company.

D.S.O.—Maj. A. E. Holbrook, A.S.C. Before the war he took a prominent part in selecting and purchasing motor cycles for the Army. He was a keen rider of a Zenith.

MILITARY CROSS.—Temp. Capt. S. Bramley-Moore. He and his partner, Mr. F. Hulbert, (now with the Triumph Cycle Co.), manufactured a motor bicycle, known as the Hulbert-Bramley, fitted with a Minerva engine, in 1904. In the early days of the movement he took part in numerous competitions; and did an enormous amount of riding.

The following officers in the M.M.G.S.: Temp. Capt. C. E. Amphlett; Temp. Sec.-Lt. C. O. D. Anderson; Temp. Capt. G. Carr, C. W. Clark, and S. A. Westrop.

### LETTER FROM A MOTOR CYCLIST AIRMAN.

WE have had an interesting letter from Flight-Lt. J. Forgan-Potts, R.N., to whose accident we referred in the issue of June 1st. He writes: "My smash consists of a broken right ankle and sundry wounds, nothing particularly serious, but all very tiresome, since I loathe lying in bed. It came about as the result of landing in the dark after raiding an enemy aerodrome, where I dropped two 65 lb. bombs from 500ft. I have been flying in France and Belgium since last September, and have been very lucky, because, though taking part in every raid since then, I never sustained much damage till this time, when, in addition to the darkness, there was a ground mist.

"The only motor cycling people I have met out the other side that you would know are Spencer Grey, my C.O., and a Belgian called Oleislagers, who is in the Belgian Flying Service—you will remember the latter from the old Canning Town days. Spencer Grey is, of course, a squadron commander in charge of the wing to which I belong. Wilberforce is a flight commander, if I mistake not. Cyril Pullin, who you doubtless remember was in the service, and was at Antwerp and Ostend, was finally invalided out. He is now working in a business at Hammersmith, and in conjunction with him I have just provisionally protected two new inventions." We wish our correspondent a speedy and complete recovery.

# AN AMERICAN MACHINE GUN SIDECAR.

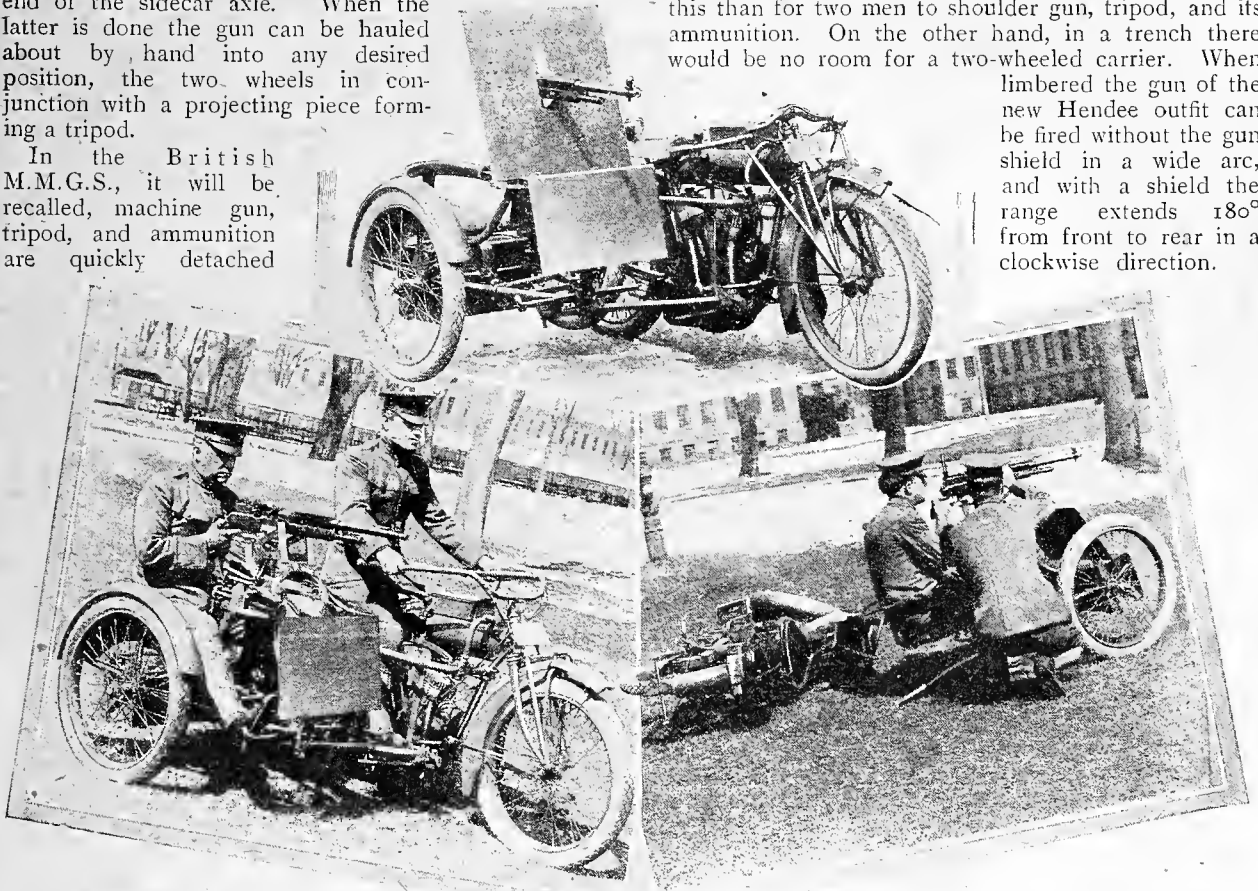
GUN CAN BE HAULED BY HAND ON TWO-WHEELED CARRIER.

THE chief feature of interest about the new Indian sidecar machine gun outfit illustrated on this page is the use of a fourth wheel, carried as a spare when travelling, and used as required for attaching to the bicycle end of the sidecar axle. When the latter is done the gun can be hauled about by hand into any desired position, the two wheels in conjunction with a projecting piece forming a tripod.

In the British M.M.G.S., it will be recalled, machine gun, tripod, and ammunition are quickly detached

from the sidecar and carried by gunner and driver to the desired firing position. Of course, if necessary, the gun can be fired from the outfit. The Indian scheme seems good in that it would enable the gun to be quickly wheeled into position as it is easier to haul this than for two men to shoulder gun, tripod, and its ammunition. On the other hand, in a trench there would be no room for a two-wheeled carrier. When

limbered the gun of the new Hendee outfit can be fired without the gun shield in a wide arc, and with a shield the range extends 180° from front to rear in a clockwise direction.



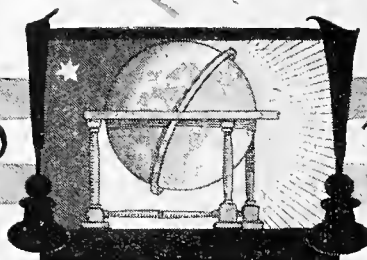
The new Indian sidecar machine gun outfit. The gun can quickly be wheeled into position.

## THE PHILIPSON PULLEY IN CONJUNCTION WITH A HUB GEAR.

AN Army officer writes to enquire whether the Philipson pulley practically converts a three-speed machine into the equivalent of a Zenith, with the additional merit of reducing the labour of gear changing. It does—but with extra complication. If it is fitted to a machine with a three-speed hub ratioed at, say,  $4\frac{1}{2}$ , 7, and 13, the pulley practically supplies all the ratios intermediate between 4 and 18, and does so more or less automatically, except at the three points indicated in the series. On the other hand, my correspondent is on less sure ground when he hopes that all our gears will shortly be transformed into infinitely variables, by the addition of the pulley, as the trend of design is all against the direct belt drive, and suffrages are at present divided between the all-chain and the chain-

cum-belt. Of course, the ideal gear is a foot-operated infinitely variable adaptable to a non-slipping transmission. The real crux of gear usage, as opposed to gear design, is the difficulty of changing up at high speeds, when it is none too safe to remove a hand from the bar, even momentarily. For this reason one or two designers are trying to fix up a foot change for the higher ratios at any rate. The Philipson, to some extent, meets this point; there is no other gear which does. The two top ratios of my own private road-burner are  $4\frac{1}{2}$  and  $5\frac{1}{2}$  respectively, but it is a good road on which I can make the best use of these ratios; for when I have whacked the machine up to such a pace on the  $5\frac{1}{2}$  that the time is ripe for snicking in the  $4\frac{1}{2}$ , I want both hands to keep it straight and steady on the modern British road. Ixion.

## LETTERS TO



## THE EDITOR

The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

### Repairing Overalls.

Sir,—I have torn my cycling overalls. Can any of your readers say what will repair them? I have tried solution, but it is a failure.

MAGISTER.

### Copper Cooling Devices.

Sir,—Do you know if Capt. Lindsay would give us further particulars of his copper cooling device? I was most interested in the claims he put forward for it in his article "The First Thousand" in *The Motor Cycle* of May 11th. I recently made some copper wire spiral springs to wedge in between the radiating fins, but I cannot say they were a great success. Obviously, the great drawback to the air-cooled single-cylinder  $3\frac{1}{2}$  h.p. being used for a sidecar is the tendency to overheat, and I think a simple yet efficient cooling device which could be made and fixed with a few tools at home would be a boon to many.

T. E. K. DONALDSON, Midshipman, R.N.

### Paraffin as a Fuel.

Sir,—I have a 1915 two-stroke Calthorpe, which I run quite well on a mixture of paraffin and petrol, in the proportion of two parts paraffin to one of petrol.

I start by inserting a rubber tube from an acetylene generator into the air inlet of the carburetter. It is held in place by shutting the throttle until the slide grips it. The machine invariably starts at once, and after about 200 yards will fire on the paraffin mixture.

I suppose the reason that I have not blown my cylinder head off is that the mixture has been much too rich!

This is a very crude method, but works very well.

LF 2111.

Sir,—I have a 1915 O.K. Junior, and the other day I thought I would try paraffin. I therefore made a mixture of petrol-paraffin of two to one, and found starting just as easy and running no different. The following day I added more paraffin, this making the ratio equal, and then tried it on the road with the engine cold.

I paddled off quite easily, and the engine started in a couple of yards, and there was no difference whatever in the running. The only thing I noticed was a slight dripping from the carburetter.

The other day one of the nipples at the end of the Bowden cable came away, and as I had not another one handy I bound up the end with a little piece of wire and soldered it. This made quite a permanent job.

C. T. DAWSON.

### Carbonisation.

Sir,—The period in which carbon deposit is started in engines, in my opinion, is when starting the engine cold. The great majority of motorists never stop to think to what trouble they are putting themselves by racing an engine at the start. First of all, oil is more readily sucked past the rings when cold. Secondly, the gas is too damp and rich and only partially ignited, with back firing, etc., leaving the soot from those causes to settle on the oil; therefore the first signs of carbon deposit are given.

Moral, never race an engine at the start, let it warm up gradually till the piston has expanded, giving more resistance against oil passing to the top, and the gas is better and drier, leaving no deposit whatever. Fill the engine with oil when it is warm, not when cold and race it. I have had valves bright at 3,500 miles.

B.E.F.

A.M. FRY.

### A Correction.

Sir,—I am constrained to correct an error in your contributor's article "Peace—and War" in the issue of May 25th. Crowborough Beacon is not the highest point in Sussex. Crowborough is 792ft. on the Ordnance map, 804ft. according to Black's "Sussex." Ditchling Beacon is 813ft. on the Ordnance map, 858ft. according to Black's "Sussex."

SON OF SUSSEX.

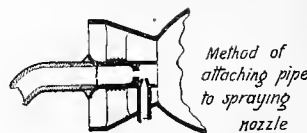
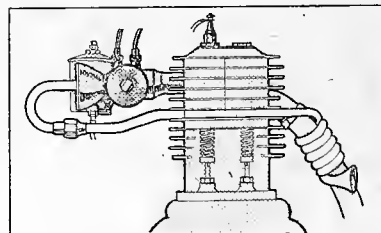
### Piston Tap or What?

Sir,—I read with interest "Trials Rider's" remarks on piston tap. I am also a rider keen on twins of large proportions, having at present a 7.9 h.p. road racer Indian, single speed and clutch. Now this machine developed no tap till about 1,800 miles had been run, which was about the same mileage as another similar machine had run before tapping. This tap or knock often ceases when the engine warms up, seeming to indicate a loose gudgeon pin. My own case, I consider, points plainly to ignition. It knocks hardly ever on main throttle; but, on the pilot, when picking up especially, if the clutch is not eased, this, or a slight retard, immediately cures the complaint. As for the oil theory, all my oil passes through the front cylinder to the crank case. Undoubtedly the inclined cylinder aggravates the evil. I may say the knock is very slight indeed, and would not be noticed on a noisy engine. I should greatly appreciate experiences of other Indian riders.

SPEED MERCHANT.

### Vaporising Heavy Fuels.

Sir,—In view of the present difficulty in obtaining petrol and the desire to use successfully the heavier fuels, such as Binks XXX, benzolite (which is well known up North), and paraffin-petrol mixtures, I venture to suggest the following



Method of attaching pipe to spraying nozzle

experiment to owners of machines with the Senspray carburetter having a spraying nozzle. Referring to the sketch, a pipe of slightly larger bore than the spraying nozzle is attached to it by brazing or soldering. The pipe is then led close to the cylinder head and six or more turns made around the exhaust pipe, the free end being well belled out and pointing ahead. When the engine is running the temperature of the air passing over the fuel jet should assist in breaking

up the fuel. Of course, it may be argued that the subsequent mixing with colder air passing through the main intake will have an effect opposite to that intended; but I think the device well worth trying, and would be pleased to hear the results obtained. I intended to try it myself, but my time is nearly totally occupied on munitions.

C. MATHER.

**Enclosed or Open Chains.**

Sir,—Respecting the question raised concerning the temperature of the bath for lubricating chains, the temperature we advocate is that of boiling water, viz., 212° F., and we do not recommend that a bath be raised to a higher temperature than, say, 250° F. Above this there is a danger of the material of the chain being affected by the heat, especially the bushes, which have a glass hard surface.

There is no necessity to boil the grease, as it will be sufficiently fluid to get to the wearing parts at the above-mentioned temperatures.

HANS RENOLD, LTD.

E. E. BRADBURY.

**A Plea on Behalf of the War Worker.**

Sir,—The editorial note, under the above heading, in your issue of May 25th, must have been appreciated by all those war workers who are affected by the proposed new taxation and the continued increase in the price of petrol.

Having been in close contact with hundreds of munition workers, who are putting forth every ounce of energy in order that material may be forthcoming with which to defeat the enemy, it does appear to me a scandal that, in addition to being called upon to pay extra taxation for owning a motor cycle, they should have to pay an increased price practically every week for petrol. I know of no finer tonic for the man who has, say, been working for twelve to fourteen hours a day, possibly more, at the bench, and for six days a week, than a run into the country on the seventh. We are continually asked to economise. What cheaper form of sport is there, I would ask? And what will happen if our friend the war worker cannot use his machine owing to the excessive price of petrol and possibly a limitation to its use by Government enactment? Will he spend less during the time the machine is laid up? Of course not.

If the war worker could be satisfied that the extra amount he is called upon to pay for petrol was finding its way into Government coffers I do not believe many would complain, but pay cheerfully; but when it is an undoubted fact that advantage is being ruthlessly taken by a clique to enrich themselves during the greatest trial this nation has ever undergone, it is time the Government adopted a drastic line and placed a maximum upon the price of petrol. E.P.

**"Spots."**

Sir,—I read with interest the article on "Spots" in your issue of May 25th, particularly as I have been seeking economy in the same direction. The only remarks I have to make on the article are that "one swallow doesn't constitute a summer," and that, having conducted many machinery trials, I have found that very little reliance can be placed on results obtained from short tests.

My mount consists of a tandem tricycle with Auto-wheel attached. Prior to the use of "Spots," the wife and I had run it about 4,000 miles, and the conclusion came to, as to its economy, was that it was good for 90 m.p.g. With a view to checking this for comparison, I ran the tank—which holds half a gallon—out to a finish on a run through Ripley, Guildford, Cranleigh, Ewhurst, and back by the Dorking Road. Careful plotting gave the distance covered as forty-seven and a half miles. A second trial was made on a run to East Clandon and back. The distance run was fifty miles, and there was still a little petrol remaining in the tank.

Using "Spots" according to the instructions given, I made a trial run to Bramber Castle and back, carrying an extra half gallon of petrol for the return journey, going by the Brighton Road out of Horsham, and picking up the Worthing Road after passing West Grinstead on the way back. I ran out of petrol two miles from home, having then covered ninety-three miles.

A second trial on a run to Bagshot Heath and back gave forty-nine miles to the half gallon. Judging from these trials, I fail to see where the 25% economy in using "Spots" comes in. I have a considerable number of them left, which, if they do not prove injurious in other respects, I shall continue to use, and should I ever obtain any appreciable measure of economy, in justice to the producers, I will let you know.

HOMOCEA.

Sir,—I have read with interest the article on "Spots" in *The Motor Cycle* of May 25th, in which your corre-

spondent gives his experiences with a quart of the prepared spirit.

I have tried this preparation for several months, using eighteen to twenty gallons of the prepared spirit; my next door neighbour has also been trying it, and we have compared notes, and find we agree. Mine is a special  $3\frac{1}{2}$  h.p. engine, tuned up for very fast work, and used with a featherweight sidecar; his is a slower tourist machine with a heavy sidecar, also  $3\frac{1}{2}$  h.p. I have been a motor cyclist since 1905, and usually drive with loaded sidecar as fast as the roads permit; my neighbour drives slower, but is a glutton for hill work.

Our experience is this, apologising for being at variance with your contributor, we can and do give more air, considerably more, than without "Spots." We find considerably more power on hills, and it is faster everywhere, a little better consumption, and a great difference in the action of the engine, which is difficult to explain, but which is very noticeable. The drive feels much smoother, instead of the feeling of being carried along by a series of jerks. Before I tried "Spots" I never noticed the feeling of jerkiness alluded to, but after driving with "Spots" for 1,000 miles and coming back to pure spirit after filling up at a garage on a long ride, this feeling was most pronounced, and the engine vibration seemed most excessive. On the grounds of comfort alone I should never drive without "Spots" again, except under circumstances over which I had no control.

Another peculiarity I have noticed is that the carbon has been very soft, and has come off much more easily since using "Spots" than before.

Re the paraffin controversy, I have for some time been in the habit of doing a considerable distance with 25% paraffin, and then returning to petrol for comparison. I find little difference between the two, but if the paraffin is increased power is lost and the engine heats.

CHIEF CONSUL, C.T.C.

**Another Family Sidecar.**

Sir,—Being a constant reader of your delightful and intelligent paper for over three years, I have often been interested in the illustrations and accounts of readers' machines. Having had some postcards taken before joining up at the end of April, I thought you would be interested in one accompanying this letter.

My machine is a 1915 New Hudson. You will notice that it has a good load to take about, and Bristol is rather hilly. I have been several hundreds of miles, and have only had one stop, caused by a broken fastener, on Black Horse Hill, on the way to New Passage. I can go up the hill, also Park Street, on second gear. I average about 65 to 70 m.p.g. I have fitted an electric S.C. light and rear light in series, with a light inside the car to show if the rear light is working.

E. CLEMENTS.



A family sidecar outfit that has given its owner satisfaction. It is a New Hudson, and the rider, E. Clements, gives his experiences in a letter on this page.



# QUESTIONS & REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Fitting a Cut-out Switch.

**?** I am thinking of having a cut-out fitted on to the handlebar of my Lincoln-Elk motor cycle (Bosch magneto). Please let me know if by doing this I shall be running any risk of damaging the magneto in any way.—R.B.

No, you will not run any risk of damaging the magneto by fitting a magneto switch. There is no reason why there should be more risk of damaging a motor cycle magneto than a car magneto, which is always fitted with a magneto cut-out.

## Heating the Air Intake.

**?** A friend of mine told me that he had seen a couple of motor cycles fitted with a hot air intake, and the owners had told him they had improved their consumption by 20 m.p.g. and also the running, and he advised me to try the idea on my machine. As it was only an inexpensive job, and I had seen similar ideas in your paper from time to time, I took it to a mechanic, as I have not the time, and explained what I wanted, viz., a copper or iron pipe from the carburetter (Amac) to the cylinder. The mechanic rather tried to put me off the idea, as he said that cold air is required to keep the cylinder cool, and that the hot air would cause overheating, set the carburetter on fire, etc. If you will kindly say if it will be satisfactory I should be greatly obliged. The makers fitted a 55 jet, and I have altered it to a 51, and it seems to give just as much power. Should I chance a still smaller jet, or would it be inclined to cause overheating owing to too weak a mixture? I believe some weeks back I saw an answer to a question on coasting down hill, and you advised him not to put the lever into neutral, but to keep in high gear and lift the exhaust lever, with clutch out. I always get into free engine with air wide open, thus cooling the engine. When I slow down to about 8 or 10 m.p.h. I start the engine and slip into middle, and then high, and have always found this satisfactory. Is not this correct?—W.P.

The mechanic was in error. You want to keep the air coming into the carburetter as hot as possible, and hot air will in no way cause the machine to overheat, but will assist the vaporisation of the petrol. As to the suggestion that it will set the carburetter on fire, this is abso-

lutely absurd. Have the alteration carried out in the manner suggested, and we are sure you will get considerable improvement in running and economy, though a saving of 20 m.p.g. is a little too much to expect. Having fitted the warming pipe you may be able to use an even smaller jet. It is a most extraordinary fact that motor cycle makers have entirely failed to realise that the warming of the air before entering the carburetter is most beneficial. How beneficial can be told by driving a car which is fitted with a controllable hot water jacket to the vaporising chamber of the carburetter. We once carried out the experiment by cutting off the hot water on one of the hottest days in the summer. After running about two miles like this we were very glad to turn the hot water on again. Your method of descending a hill is quite all right.

JUNE 29th, 1916,

THE DATE OF

THE  
MOTOR CYCLE

Economy and Utility  
NUMBER.

## Clutch Slip.

**?** I have purchased a second-hand N.S.U. gear. I find it works well in low gear and free engine, but when the control lever is in the high gear position the engine is tearing away at a great speed and the machine is scarcely moving. The gear seems very tight and gets very hot, almost too hot to put my hand on. I have well oiled it. It seems very hard to start, being in gear, I believe. I possess another machine with an N.S.U. gear, which works very well, and everything is slack and has plenty of play. Does it harm the N.S.U. gear to coast down hills in free engine position?—W.M.

We should say that the trouble is probably due to too weak a clutch spring, or to the top gear cone clutch, which is worn and consequently slips. You should make quite certain that the operating fork is quite clear of the pin which moves the clutches when the lever is in the top gear position; if it fouls this pin it will prevent the top gear clutch going right home. The operating mechanism

should be slack when top gear is in engagement. When you have made quite certain this point is in order the gear should be taken down and examined by an expert, and new parts fitted if necessary. There is no harm in coasting down hills with the clutch out with this gear.

## Sidcar Alignment.

**?** I have read with interest the article "The Risks of Imperfect Alignment," by "H.M.B.," in your last issue, and would appreciate information respecting any published matter on how to obtain correct alignment, or a further article on how to secure this.—W.J.R.  
The information for which you ask is contained in *The Motor Cycle* of March 2nd, page 198.

## Running on Paraffin.

**?** Since the Government seems to be about to limit the sale of petrol, I should be much obliged if you would inform me on the following points. My machine is a 1915 two-speed countershaft four-stroke, fitted with an Amac carburetter. (1.) Provided I fit up a small tank for petrol for starting, will paraffin do any harm to the engine? I do not see how I can fit up a hot air intake to my carburetter. (2.) Is it true that paraffin dilutes the engine oil? Shall I have to lubricate more freely? (3.) If the sale of petrol is prohibited, will it be permissible to run a motor bicycle on paraffin? (4.) My machine has a top gear of 6½ to 1, and I live at Sheerness. Is not this excessively low for a fairly flat country? Could I remedy this by fitting a larger engine sprocket?—L.B.W.

(1.) Paraffin will not do much harm to the engine if you can get the combustion reasonably good. Fit a pipe from the fixed air intake of the carburetter with a funnel end attached close up against the cylinder. (2.) If there is much unburnt paraffin about, it will dilute the engine oil, but we do not think there is much risk. (3.) We have received no information on this subject at the present time, but we do not imagine there will be any objection to running on paraffin. (4.) It depends upon the horse-power. If the machine is of small horse-power, the gear would be about right for general use in most districts, but you could certainly do with a higher gear, which you could fit by having a larger engine sprocket, for the flat country in which you reside.

**Weak Mixture.**

?

Would you please tell me how I can remedy the following trouble? I have a 2½ h.p. two-stroke engine which will take practically no air without blowing back through the carburetter (Amac), and the same trouble occurs if I open the throttle more than half way. Of course, under these conditions the engine labours up hills and gets hot. It is lubricated by the petrol system, and has done about 150 miles. —A.G.P.

The symptoms of your trouble indicate a weak mixture, which may be caused by too small a jet, jet partly choked, petrol feed or carburetter passages partially choked. You should clean out the petrol supply pipes and carburetter, and if the trouble continues then try fitting a larger jet. Make sure there are no air leaks either between the carburetter and engine, or through the crank case joints. Bind any doubtful joints with adhesive tape.

**Falling off in Power.**

?

I have a 6 h.p. twin with a two-speed gear, box and 1912 B. and B. carburetter, which, after previously having been a good climber, has suddenly refused to climb ordinary hills on low gear which it used to take on top gear. The first time the machine failed me I found that the carburetter was starved. When it stopped I shut off the petrol, took off the float chamber lid, and found the chamber only had about lin. of petrol in it. I could find no obstruction in the pipe or the carburetter, but the float was punctured. I have since fitted a new needle valve, float, and jet, and the machine certainly runs better. The engine itself is in good condition, and the valve and the magneto timing are correct. I have no misfiring. I have thoroughly cleaned out the silencer. Since fitting new needle valves, etc., I have tried the machine on low gear with the throttle wide open on a short, fairly stiff hill, and it takes me a good part of the way up, and then gradually stops without any knocking, but on this occasion I found plenty of petrol in the chamber. On the level or gradual slopes the machine runs splendidly. The jet is a No. 32. The carburetter will not take the air lever beyond the throttle even at 20 m.p.h. After a run of about ten miles the engine gets very hot, although being well lubricated with the oil recommended for this engine. My petrol consumption is very heavy. I am only able to get about 30 m.p.g. with side-car and 12 st. passenger. When the machine is standing the petrol drips slightly at the bottom of the jet. —HILL-CLIMB.

Your trouble may be due to air lock in the petrol pipe or tank, caused perhaps through having no air vent in the tank stopper. The heavy consumption is probably caused through the petrol level

being too high, which is indicated by the petrol dripping from the carburetter when standing. Incorrect carburetter adjustment is also probably the cause of the overheating. Make sure your valves are seating properly, and the clearance between the valve stems and tappets is not too great.

**Fitting an Extra Belt Fastener.**

?

(1.) Will you kindly tell me if any harm is done by using an extra pair of links on a belt? The wear is on the ends, necessitating continual shortening. The other part of the belt being quite sound, would be good for many miles, if no harm will be done by using it in this way. (2.) I have a bottle of sperm oil, which I keep in my cycle shed. In cold weather it goes cloudy, and when it resumes its usual clearness, about half an inch of sediment appears at the bottom. In using the oil, should only the clear part be employed, or are there any qualities in the sediment necessary in the lubrication? I use this oil for my hub gear. (3.) Should there be any side play in the exhaust tappet and guide? The inlet gets plenty of oil, and throws it up through the guide, but not from the exhaust, and there seems to be a fair amount of side play. —E.W.S.

(1.) The only harm you do by fitting two links on a belt is that you slightly reduce the driving qualities of the belt, but really it is hardly appreciable. (2.) All oils tend to thicken in cold weather. Perhaps before using it, it would be as well to warm the bottle and shake it up, when all the contents will then be of the same consistency. (3.) There should be no appreciable side play in the exhaust tappet and guide.

**Knock in Hub.**

?

As a constant reader of your paper, I should be much obliged if you could help in the following matter. My machine, a 1914 3½ h.p. single with Armstrong three-speed gear, Mark III., has a nasty knock in the hub. On dismantling the gear I found there was a decided looseness between the inner and outer portion of the clutch, due to the keyed phosphor-bronze plates which engage with the slots in the hub shell being worn at the keys. These keys are exactly .34 in. smaller than the slots in the hub shell. I could get hold of the belt rim and the back wheel and oscillate one against the other. Would this cause the knock? The hub only knocks while travelling on too high a gear in relation to engine speed to road speed, but as soon as the machine picks up road speed the knock disappears. —J.R.G.

The knock which you hear is undoubtedly due to wear of the clutch plates. This knocking is frequently noticeable in an almost new hub if driven slowly on top, owing to the back lash in the gears, which it is practically impossible entirely to do away with. If this lash is accentuated

by wear the knock is, of course, even more noticeable. We would recommend you to have new clutch plates fitted.

**RECOMMENDED ROUTES.****EXETER TO PLYMOUTH.—C.E.W.**

Exeter Chudleigh, Ashburton, Ivy-bridge, Plymouth. Approximately 43 miles.

**MANCHESTER TO CRICCIETH.—H.H.S.**

Manchester, Altrincham, Northwich, Crabtree Green, Chester, Mold, Ruthin, Bala, Festiniog, Portmadoc, Criccieth. Approximately 110 miles.

**PLYMOUTH TO NEWQUAY.—H.P.**

Plymouth, ferry to Torpoint, Polbathick, Liskeard, down Glyn Valley, Bodmin, Lanivet, Indian Queens, Newquay.

**LOUGHBOROUGH TO BRISTOL.—C.E.W.**

Loughborough, Leicester, Sharnford, Coventry, Kenilworth, Warwick, Stratford-on-Avon, Broadway, Winchcomb, Cheltenham, Gloucester, Stone, Bristol. Approximately 133 miles.

**HUNGERFORD TO WEYMOUTH.—W.N.C.**

Hungerford, Newbury, Whitechurch, Winchester, Romsey, Cadnam, Ringwood, Wimborne Minster, Bere Regis, Dorchester, Weymouth. 105 miles approximately.

**LIVERPOOL TO TORQUAY.—J.G.**

Liverpool, ferry to Birkenhead, Sutton, Chester, Broxton, Whitechurch, Hodnet, Cradgington, Wellington, Bridgnorth, Kidderminster, Hartlebury, Worcester, Tewkesbury, Gloucester, Standish, Stonehouse, Nailsworth, Swainswick, Bath, Chewton Mendip, Wells, Glastonbury, Othery, Durston, Taunton, Wellington, Cullompton, Exeter, Chudleigh, Newton Abbot, Torquay. 275 miles approximately.

**BLACKBURN TO WOOLWICH.—D.P.**

Blackburn, Chorley, Wigan, Warrington, Knutsford, Holmes Chapel, Newcastle-under-Lyme, Stone, Rugeley, Lichfield, Tamworth, Atherstone, Three Pots, Kilsby, Daventry, Towcester, Dunstable, St. Albans, Barnet, New Barnet, Enfield, Ponders End, Chingford Green, Woodford Wells, Woodford Green, Barking-side, Ilford, Wallend, North Woolwich, ferry across Thames, Woolwich.

**GILLINGHAM TO BRISTOL.—A.D.C.**

Gillingham, Wrotham Heath, Ightham, Westerham, Oxted, Godstone, Redhill, Reigate, Dorking, Shere, Guildford, Farnham, Odiham, Basingstoke, Kingsclere, Newbury, Hungerford, Marlborough, Calne, Chippenham, Marshfield, Bristol. Return through Bath, Melksham, Devizes, Rushall, Ludgershall, Andover, Whitechurch, Odiham, and then by the route we have previously given.

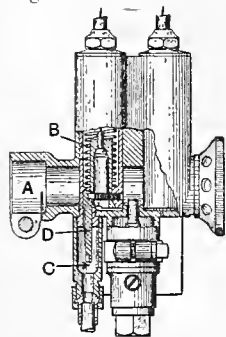
**PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.**

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always having their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.



### A Lubrication Improvement.

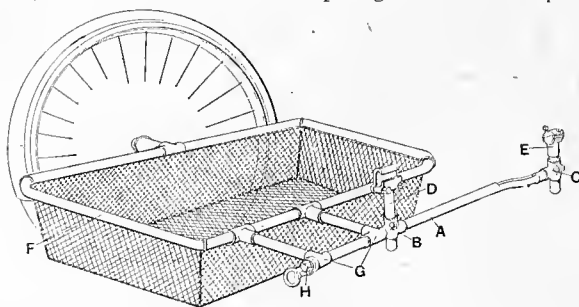
The ideal lubrication system should supply oil to the engine in proportion to the work being done, and this is attained, in the case of two-stroke engines, by this invention, which is shown applied to a carburetter of the Triumph type. The gas passage to the engine is shown at A, and the ordinary throttle barrel at B. The movement of the throttle barrel regulates the flow of oil, so that as the throttle is opened the oil supply is increased, and *vice versa*. This is effected by conducting the oil to a chamber C, the upper end of which communi-



cates with the gas passage A. Passing through this outlet is a taper needle D, attached to the throttle barrel. Thus, as the barrel B is raised, the oil outlet is increased in area, and more oil passes to the engine. Various alternative methods may be adopted, and the incorporation of the device with the carburetter forms a very neat and ingenious construction.—G. E. Stanley, (No. 11,470, 1915.

### A Simple Side-carrier.

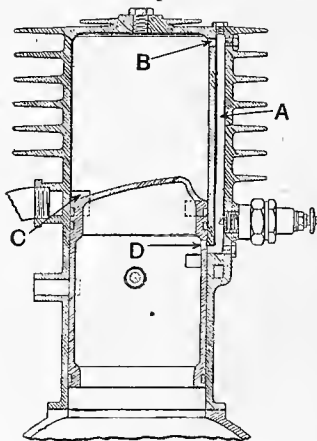
The main tube A is provided with sockets B C in which are secured the members D E, which are adjustable in the sockets to permit of application to cycles with wheels of different diameters. The carrier frame F has a pivotal connection at G with the tube A, so that the cycle and the carrier can assume varying angles, compensating for rough roads and allowing the cycle to incline when turning corners. At H is a locking device whereby the carrier frame can be locked to the tube A, rendering the parts rigid and allowing the carrier to act as a stand and maintain the cycle upright.—A. W. Wall, Ltd., and J. A. Richardson, No. 320, 1915.



### Two-stroke Ignition Improvement.

In order to avoid misfiring at low speeds in two-stroke engines, it is here proposed that the ignition spark be located in a passage A in the cylinder wall, which is filled with pure gas. When the plug is located in the cylinder proper

the points are surrounded by a mixture which is more or less polluted by retained exhaust gases. The passage A is always open at the top, as shown at B, whilst its lower end is closed by the piston wall, except for a brief period when the piston is approaching the lower end of its stroke. Immediately after the exhaust port C is opened, and before the transfer passage is opened, an orifice D in the piston wall comes into register with the passage A, with the result that a portion of the charge under pressure in the crank

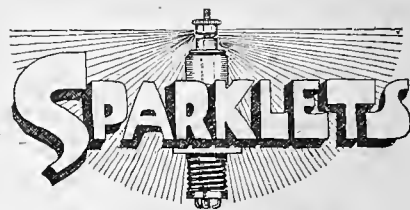


case passes into the passage, forcing out the exhaust gas therein. Next the ordinary transfer passage is opened, and the remainder of the gas in the crank case passes into the combustion chamber in the ordinary way. The fresh gas is retained in the passage A until the spark

takes place, when it is ignited, and in turn ignites the main charge.—W. R. F. Patchett, No. 14,303, 1915.

### The Douglas Soldiers' Fund.

Since the institution of the above fund, which is supported by employees of Douglas Bros., 734 parcels have been despatched to 104 former comrades now on active service. The employees, both staff and workmen, are doing excellent work in looking after those who have gone, and also in assisting dependants.



### A London Magneto Hospital.

We understand that Imperial Motor Industries, Ltd., are enlarging their premises at 11, Denmark Street, Charing Cross Road, W.C., in order to cope with the demand for the quick repair of damaged magnetos and the supply of spare parts thereof.

### Rotax Accessories.

Motor cyclists living in the Willesden district will be interested to hear that Rotax accessories may now be purchased at the Rotax Willesden works. The latter are ten minutes walk from Willesden Junction, just off the main road between Willesden and Acton.

### An Attractive Sidecar.

The sidecar used by E. Kickham in the Birmingham M.C.C. Easter trial, and illustrated on page 403 of our issue of April 27th, has evoked much interest. It may be as well to mention, therefore, that the sidecar in question is being marketed by Mr. Kickham himself. His address is 43, Stokes Croft, Bristol.

### Bradburys in the Southern Counties.

A. F. Godwin, the Bradbury representative for London and the South of England, has joined the Royal Flying Corps as a car driver. Any correspondence with customers in this district will be dealt with direct by the head offices of Bradbury and Co., Wellington Works, Oldham, or may be sent to Mrs. Godwin, 8, Aycliffe Rd., Shepherd's Bush, London, W.

### Catalogues Received.

Ariel Motor Cycles, 1916. Ariel Works, Ltd., Bournbrook, Birmingham. The Ariel catalogue makes its appearance somewhat later than usual this year owing to printing difficulties, but it has been worth waiting for, as it is a really good production.

E.I.C. Magnetos: Booklet No. 1. The Electric Ignition Co., Ltd., Sampson Road North, Birmingham. An excellent handbook dealing with the E.I.C. magneto, of which, we are told, 15,000 have been manufactured since the outbreak of war. It is well illustrated, and deals with the magneto in a thoroughly practical way. Those motor cyclists who are joining a technical corps in which a knowledge of the working of a magneto is desirable would benefit by a study of the E.I.C. booklet.

Montgomery Sidecars. W. Montgomery and Co., Coventry. We are in receipt of the Montgomery Book, the fourteenth annual brochure issued describing the excellent products of this firm. In this publication numerous models of sidecars produced by this company, who were one of the pioneers firms in sidecar construction, are illustrated and described. One of the most interesting, of which we shortly hope to have some personal experience, is the type with spring axle, intended for spring frame machines.

## MOTOR CYCLES FOR SALE.

## Auto-Wheels.

- 14 h.p. Auto-Wheel and Cycle, 1914, good condition: £11.-10/-, Mnsgrave St., W. Hartlepool. [X1290]
- AUTO-WHEEL, late 1914, in excellent condition; £8/15.—Eagles and Co., High St., Acton, W. [X1394]
- AUTO-WHEEL, excellent order, just overhauled, nearly new tyre; £8/10.—Glazebrook, Castle Rd., Kenilworth. [X1407]
- WALL Auto-Wheel, 1914, latest, single lever control, little used; bargain, £8/10.—Murray, 37a, Charles St., Hatton Garden, Holborn. [X1354]
- AUTO-WHEEL, Wall 1914, attached to gent's Rambler 3-speed cycle, gear case, etc., perfect condition, little used; bargain, £10, complete, or nearest offer.—W. Carpenter, Aylington, Eastworth Rd., Chertsey, Surrey. [X6349]
- 1915 Auto-Wheel, B.S.A. model, in very good order, complete, £9; 1915 standard model, used few times only, as new, £10; standard model, in very good order, £8.—The Walbro Motor Cycle Co., Saffron Walden, Essex. Phone: 45. [X1431]

## Bat.

- BAT, Armstrong 3-speed hub; £25.—Goodhouse, Broadway, East Dulwich. [X6436]
- BAT-J.A.P., 8 h.p., 2-speed, Gloria coachbuilt sidecar, hood and screen, splendid condition; £42.—476a, Harrow Rd., W. [X6534]
- BAT, just delivered, latest 4.5 h.p. sporting model, with 2-speed countershaft; £63/5.—P. J. Evans, John Bright St., Birmingham. [X1332]
- 6 h.p. Twin Bat, Armstrong 3-speed, picked engine, everything perfect, guaranteed, reliable and fast, new Dunlop belt, horn, tools, spares; £35.—Day, Okehampton. [X1442]
- 8 h.p. 1912 2-speed Bat, spring frame, clutch, kick-start, new c.b. sidecar, child in front, wind screen, lamps, tools, etc.; any trial given; price £40.—Apply by letter, 26, Manor Lane Terrace, Lee, S.E. [X6479]
- 1914 6 h.p. Special Overhead Valve Bat-Jap, 3-speed gear, kick-start, in very good order and very fast, enamel and plate as new, grey T.T. model; £39; take Douglas part exchange.—Wallis, 49, High St., Saffron Walden, Essex. Phone: 45. [X1433]

## Blackburne.

- BLACKBURN, 1914, 3-speed, hand clutch; 37 gns.—Troward, 78, High St., Hampstead. Phone: 5392. [X6476]

## Bradbury.

- BRADBURY, 1912 or 1913, clutch model, fine order; £26.—Grover, Bletchley. [X1246]
- BRADBURY, 4 h.p., Whittle belt, good condition; £17.—Spreckley, Watcombe Circus, Nottingham. [X1272]
- BRADBURY 1913 "Combination, 4 h.p., Bosch, 2 speeds; 28 gns.—1, Ebner St., Wandsworth. [X1408]
- 1914 Bradbury, 4 h.p., 2 speeds, kick starter, sidecar, good condition; £38.—Porter, Waratah, Hockley, Essex. [X6466]
- 1914 4 h.p. Bradbury and sidecar, 3 speeds, kick start; £36, Douglas wanted.—14, Kenne St., Ashton-under-Lyne. [X6434]
- BRADBURY, 3 1/2 h.p., in splendid condition; owner joined colours; best offer accepted.—Melling, Beacon View, Bellings, Wigan. [X6300]
- BRADBURY 4 h.p. Countershaft, sidecar, accessories, overhauled, splendid condition; £30.—31, Wynn Rd., Forest Hill. [X6429]
- BRADBURY, 1913, 3 1/2 h.p., 2-speed, sidecar, lamps, horn, speedometer, tools; £30.—W. Groves, Printer, Church St., Lower Edmonton (next station). [X1261]
- 1912 4 h.p. Bradbury, engine re-bushed, tyres as new, re-enamelled, in perfect order; cheap, £20.—Walbro Motor Co., Saffron Walden, Essex. Phone: 45. [X1436]
- BRADBURY and sidecar, 4 h.p. (lowest taxation), 3-speed, very complete with lamps, speedometer, Lucas kit bag, etc., property of officer on service; £40.—Apply, F. Gibson and Co., Ltd., Motor Engineers, Abingdon, Berks. [X6317]

## Brown.

- BROWN, 3 1/2 h.p., and sidecar, 2-speed, in good order; £25; easy payments arranged.—Jones, Garage, Broadway, Muswell Hill. [X6239]
- 3 1/2 h.p. Brown, Armstrong 3-speed gear, clutch, 32 closed mag., decompressor, with cane torpedo sidecar; sell £25, or exchange with cash for 1913-14 coach combination, 6-8 h.p., with speeds.—Fernel, Argoed, Mon. [X6522]

## B.S.A.

- 1916 B.S.A., just delivered; £62.—Parker and Son, St. Ives. [X6560]
- B.S.A., new 1916 models H and K in stock, no waiting.—Moss, Wem. [X1323]

## CORONET SIDECARS.

We are building special models for Harley-Davidsons, Excelsiors, and Indians, enamelled either grey or red to match machines, and fitted with 28 x 3 in. tyre and four point attachment.



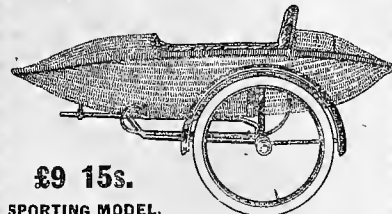
FROM

£10 15s.

Send for Illustrated Catalogue describing these well-known Sidecars.

EXCHANGES.

TRADE SUPPLIED.



£9 15s.

SPORTING MODEL.

## 7-9 h.p. HARLEY-DAVIDSON.

- 11, electrically equipped, 3 speed ..... £76 13  
11, standard 3 speed model ..... £68 5

Cash Offers Wanted.

## CASH OFFERS WANTED.

- 7-9 h.p. INDIAN, 1915, 3-speed electrical model, and £18 Montgomery Sidecar ..... £69 15  
1916 7-9 h.p. HARLEY-DAVIDSON ..... £80 15  
1916 ditto, electrical model ..... £89 0  
7-9 h.p. INDIAN, 1915, electric model, with Millford £18 18s. Sidecar, screen ..... £75 0  
8 h.p. ZENITH, 1913, Zenith gear ..... £29 15  
21 h.p. WOLF, 1916, 2-stroke, 2-speed ..... £33 10  
A.C. Sociable, 1912, hood, screen, 3 brass lamps ..... £39 15  
6 h.p. REX, 1912, 2-speed model ..... £25 0  
6 h.p. TYLER, 1915, 2-speed model ..... £21 15  
31 h.p. TRIUMPH, 1910 model ..... £18 15  
31 h.p. LINCOLN-ELK, 1912 model ..... £14 15  
5 h.p. INDIAN, 1915, 3-speed, finished red, beautiful condition ..... £57 15  
4 h.p. ZENITH, 1912, variable gear ..... £25 0  
1913 HUMBERETTE, 8 h.p., hood, screen, 5 lamps, and speed wants attention ..... £39 0  
4 h.p. NEW HUDSON, 1915, 3-speed model, with £13 coach Sidecar ..... £52 15  
3 1/2 h.p. P. & M., 1909, 2-speed, chain drive, with Sidecar ..... £19 15  
6 1/2 h.p. DE DION, 2-seater Car, 2 speeds and reverse, photo freg ..... £15 15  
3 h.p. LINCOLN-ELK, 1911, magneto ..... £12 15  
3 1/2 h.p. P. & M., 1911, 2-speed model, with Sidecar, lamps, and horn ..... £23 15  
2 h.p. PREMIER, 1912, 3-speed model ..... £20 15  
New 21 h.p. Petrol Stationary Engine, magneto, 2 flywheels; listed £21 10s. £15 15  
31 h.p. HUMBER, 1911, 2 speed ..... £17 15  
31 h.p. P. & M., 1909, 2-speed model ..... £16 15  
1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn and lamps ..... £79 0

## MISCELLANEOUS BARGAINS.

- New £5 Weatherproof Magneto; £3 10s. B. & B. Carburettor; 12/6. Amac Carburettor; 12/6. Good complete Sidecar; 32/6. Burbury £13 Coach Sidecar; £6 5s. Coach Cane Sidecar; £3 10s. Wicker Sidecar, enclosed body; 42/6. Sidecar Chassis, with tyre; 27/6. Speedwell £14 Coach Sidecar, with screen; 27/10s. Lightweight Coach Sidecar, new; £7 15s. Nearly New Douglas Carburettor. New Coach Sidecar Body; £3 5s. New English Horns, listed at 18/6; 12/6. New Sidecar Chassis, complete with all fittings; 65/-. 1916 Binks Carburettors; your old carburettor taken in exchange.

BOOTH'S MOTORIES,  
PORTLAND PLACE, SKIRCOAT ROAD,  
HALIFAX.

'Phone: 1062.

Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## B.S.A.

- COLMORE Depot, 261, Deansgate, Manchester, for immediate delivery of B.S.A. [X079.]
- B.S.A., all models, and sidecars in stock at Colmore Depot, 44, Finsbury Avenue. [X6532]
- B.S.A. Models H and K in stock; immediate delivery.—Colmore Depot, 261, Deansgate, Manchester. [X6024]
- B.S.A., 1915, 3 1/2 h.p., 2 speeds, engine in excellent condition; £32.—F. Stoker, Hucklebridge, Gloucester. [X6309]
- NEW 3 weeks Model H B.S.A., run 200 miles, complete with accessories; £60.—Holme, Dalton-in-Furness. [X1360]
- B.S.A.—Immediate deliveries from stock of model H. machines, £64.—Grosvenor Garage, Bradford St., West, Bolton. [X0886]
- B.S.A., 3 1/2 h.p., 2-speed, free engine, accessories, cane sidecar; £35.—4, Buckhurst Buildings, High Rd., Buckhurst Hill. [X1294]
- B.S.A., new models.—I have a good stock of model H's and No. 2 sidecars; no waiting.—Hucklebridge, 133, Sloane St., London, S.W. [X0436]
- B.S.A., 1912-15, 3 1/2 h.p., 2-speed, F.E. combination, excellent order; £38; triini; called up.—Chapman, 58, Lordship Lane, Dulwich. [X6386]
- B.S.A. Models H and K actually in stock; first cheque secured.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X6360]
- 1915 B.S.A., 3-speed, kick starter, sidecar, speedometer, in first-class condition; £62/10.—Motor Mart, 56, Tennyson Rd., Eastbourne. [X6319]
- B.S.A., 1914, 4 h.p., belt-cum 3-speed countershaft, cane coachbuilt sidecar, excellent condition; £48; accessories.—Welch's, 48, Evering Rd., Stoke Newington. [X6502]
- B.S.A., 1913, 3 1/2 h.p., wicker Mills-Fulford sidecar, perfect running order, absolutely genuine; seen any time by appointment; price £40.—Sydney Winter, Tottenham. [X1242]
- 4 1/2 h.p. B.S.A. Chain Combination, hood, apron, screen, grid, speedometer, gas cylinder; cost £100 January, £65, no offers; perfect.—Steele, 118, King St., Hammersmith, London. [X6400]
- 1916 B.S.A. Combination, F.R.S. lamps, Low generator, etc., guaranteed done under 30 miles, ridden once only; owing to serious illness must be sold; what offers?—Briggs, Whitby. [X6415]
- B.S.A., 1913, 3 1/2 h.p., 2-speed, free engine, all accessories, new tyres, first-class condition, for quick sale, owner joining group; £28, no offers.—Apply, 3, Hoppingwood Av., New Malden. [X6297]

## Calthorpe.

- CALTHORPE-J.A.P., brand new, 2 1/2 h.p., 2-speed model; £35.—Moss, Wem. [X1324]
- CALTHORPE, late's, 1916, with Enfield 2-speed gear, in stock.—Pickering, Mardol, Sbrewsbury. [X1419]
- COLMORE, 44, Finsbury Pavement, have all models; Calthorpe in stock; shop-sold 2-stroke, £24/10. [X6551]
- £12.—Calthorpe Junior, late 1914, 2-speed, perfect; genuine bargain.—P. Webster, 12, High St., Rugby. [X1363]
- CALTHORPE Junior, 1914, 2 speeds, 2 1/2 h.p.; £12; good condition.—Write first, 1, Campbell Rd., Croydon. [X0812]
- 3 1/2 h.p. Calthorpe-Jap, Enfield 2-speed, first-class condition, as new; £26.—Little, The Myrtles, Hawley, Dartford, Kent. [X6263]
- 1915 2 1/2 h.p. Calthorpe-Jap, Enfield gear; price £28, or exchange combination, cash adjustment.—Short, Tailor, Watchet. [X6430]
- 3 1/2 h.p. Calthorpe-Jap, 1916, latest; owner called up, unable to take delivery; 5% off list price for quick sale.—Bulfit, Ampney, Cirencester. [X1347]
- COLMORE Depot, 31, Colmore Row, Birmingham, have in stock all models of Calthorpes for immediate delivery; also at our Manchester Depot [X0793]
- CALTHORPE, 2-stroke, 1916, latest model, Enfield 2-speed gear, just arrived from works; £32/11.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [X6535]
- CALTHORPE, 2 1/2 h.p. J.A.P., with Enfield 2-speed gear, brand new, shop-sold only; list £36/15, accept £35.—P. J. Evans, John Bright St., Birmingham. [X1357]
- CALTHORPE-J.A.P., 1916, latest model, 2 1/2 h.p., Enfield 2-speed gear, just arrived from works; £37/16.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [X6533]
- CALTHORPE-J.A.P., 2 1/2 h.p., Enfield 2-speed, bought May 5th, unsold, perfect; cost 36 gns., sacrifice 29 gns.; approval willingly.—Steer, 5, Cornwall St., Exeter. [X6428]
- CALTHORPE Motor Cycles, 1916 models.—Just arrived; 2-stroke 2-speed 31 gns. J.A.P. 2 1/2 h.p. 2-speed 26 gns.; easy terms arranged.—Storeys, 118, Gt. Portland St., W. [X0777]
- CALTHORPE-J.A.P.'s, with Enfield gears, actually in stock; £37/16; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [X6354]



## MOTOR CYCLES FOR SALE.

## Calthorpe.

**CALTHORPE** latest 1916 2-speed models in stock; cash or exchange; no waiting. Also a few brand new 1915 models, slightly soiled, at reduced prices.—Eales and Co., High St., Acton, London. [X1392]

**CALTHORPES**, all 1916 models, ex actual stock, including the new 4-h.p. combination at 67 gns. Write or call for lists. Exchanges.—Mandes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6568]

**CALTHORPE-J.A.P.**, 1916 latest models in stock, 2½ h.p., 2-speed, 36 gns.; 4 h.p., twin lightweight combination, 67 gns.; lady's 2-stroke, 2-speed, 34 gns.; exchanges or extended terms.—Eale and Co., 15-16, Bishopsgate Av., Canonville St., E.C. [0492]

## Centaur.

**CENTAUR**, 2½ h.p. twin, T.T., 3-speed gear, just overhauled; any trial; £27.—Meeten, Dorking. [6552]

## Chater-Lea.

**1915 Chater-Lea** 8 h.p. Combination, splendid condition, with wind screen, lamps, etc., little used; £58.—29, Masterman Rd., High St. South, East Ham. [6520]

**1913½ Chater-Lea**, No. 7, 8 h.p., 3-speed countershaft, large coachbuilt sidecar, hood and wind screen; original cost £122, sell £65, or exchange.—Perry, Inglebrook, Poston, Derby. [X1400]

## Chater-Fafnir.

**CHATER-FAFNIR**, 2½ h.p., very fast, new condition, tyres uncut, chain anything, only wants seeing; £14.—130, Beulah Hill, Upper Norwood. [6588]

## Chater-Stevens.

**CHATER-STEVENS**, 2½ h.p., mag., B. and B., low, fast; £8/10, or offer.—Jones, Bridge House, Southall, Middlesex. [X1478]

## Clyno.

**CLYNO** Coachbuilt Combination, 1912-13, 5-6 h.p., countershaft gears, kick start, beautiful turnout; sacrifice £28.—Speechley, 45, Church Rd., Acton. [6599]

**CLYNO** Late 1914 Combination, 4 interchangeable wheels, car tyres, newly enamelled and plated, faultless; bargain, £65.—81, Lower Clapton Rd., N.E. [X1477]

**CLYNO** 2-stroke, with all the latest improvements, 3-speed hub, dip feed, Mac. horn, lamps, accessories; an absolute bargain; any trial; as new; £50.—Hathersich, 36, Bath St., E.C. [6270]

**UNUSUAL** Bargain.—Clyno combination, 3 speeds, countershaft, kick starter, Canelet sidecar, left Clyno works, October, 1913, guaranteed, tyres, engine, and gears thoroughly overhauled late 1915, and unused since, receipt shown; first £58 secures, no offers.—H. Millard, Chesham. [X1349]

## Connaught.

**1916 Connaught**, 2½ h.p., 500 miles, fully equipped; £25/10, unscratched.—54, Seymour Rd., Leyton. [6346]

**CONNAUGHTS** in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £26/17/6.—P. J. Evans, John Bright St., Birmingham. [X1335]

**CONNAUGHT**, 1915½, 2½ h.p. miniature T.T. model, almost new, little used, fully equipped; best offer over £20; owner enlisted; must sell.—Mrs. E. Rinkside, Pembury Rd., Kingston, S.W. [6412]

## Coventry Eagle.

**1915 2½ h.p. Coventry Eagle**, Villiers engine, as good as new; £24.—Walbro Motor Co., Saffron Walden, Essex. Phone: 45. [X1434]

## De Dion.

**3 h.p. De Dion**, good condition; £4/15.—Ferry, Sherwood, Highfield, Southampton. [6459]

**DE DION**, 3½ h.p., mag., smart machine; seen running; £8/15.—Speechley, 45, Church Rd., Acton. [6600]

**DE DION**, 3½ h.p., mag., B. and B., guaranteed, £7/12/6; with sidecar, £9.—149, Gray's Inn Buildings, Rosebery Av., E.C. [6387]

## Douglas.

**1914 Douglas**, 2 speeds, complete; £34.—Cross, Jeweller, Rotherham. [X1425]

**DOUGLAS**, 1913, 2½ h.p., kick starter, fine condition; £31/10.—Clifford's Garage, Sidcup. [6365]

**DOUGLAS**, 1913, 2-speed, kick start, new condition, lamps; £28.—29, St. Leonard's St., Bow. [6452]

**DOUGLAS**, 1911, fine hull-chamber, starts by wheeling; £14.—School, 85, New Oxford St., W.C. [6518]

**DOUGLAS**, 1913, 2½ h.p., Bosch, 2 speeds; bargain, 28 gns.—1, Ebner St., Wandsworth. [X1409]

**DOUGLAS**, late 1914, T.T., very steady; must sell; bargain; tyres new; £38.—35, Midland Rd., E. [6278]

**DOUGLAS**, 1914, 2 speeds, Lucas lamp sets; sacrifice £54.—11, Luna Rd., Thornton Heath, S.E. [6418]

**1919 Douglas**, in good order; bargain, new tyres, £12.—Jones' Garage, Broadway, Minsley Hill. [6240]

**DOUGLAS**, 3 h.p., late 1914, 2-speed, kick starter, clutch, splendid order; £43.—Newton, Himsley, Yorks. [X1266]

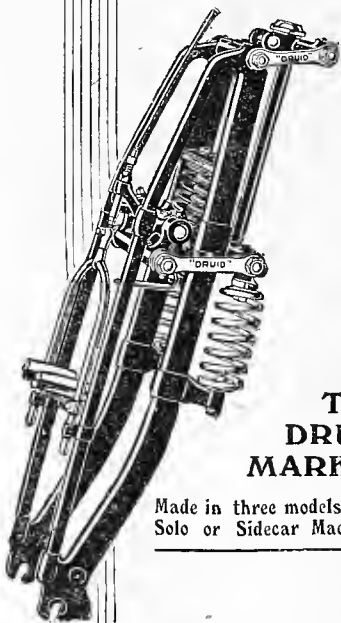
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Leopold Street,  
**BIRMINGHAM**



Made in three models — for  
Solo or Sidecar Machines

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## MOTOR CYCLES FOR SALE.

## Douglas.

**DOUGLAS**, 1913, fine condition, 2-speeds, very fast, electric lighting, accessories; £30.—S. 41, Ash Rd., Stratford. [6289]

**1915 2½ h.p. 3-speed T.T. Douglas**, finely equipped, many spares; £43.—Martin Wright, Riverside, Nottingham. [X1319]

**DOUGLAS**, 1915, 2-speed, T.T., as new, only done about 300 miles; £45/10.—Walbro Motor Co., Ely, Cambs. [X1468]

**DOUGLAS**, 2½ h.p., 1913 model, 2-speed gear, free engine, kick starter, footboards, and accessories; £32.—Moss, Wem. [X1325]

**DOUGLAS**, 1912, single gear, 2½ h.p., new heavy tyres, lamps, etc.; £17.—11, Luna Rd., Thornton Heath, C.R.E. [6417]

**DOUGLAS**, 2½ h.p., Model W, numerous accessories, new; £50; no postcards.—Skinner, Raymead, Gladstone Rd., Broadstairs. [6264]

**DOUGLAS**, 1915, immediate delivery any 2½ h.p. model, including War Office black Douglas.—Moffat, Yeovil. Tel.: 50. [5855]

**1916 New Douglas**, 2½ h.p. T.T. model; immediate delivery from stock.—R. Bamher and Co., Ltd., 33, Liverpool Rd., Southampton. [6219]

**DOUGLAS**, 2½ h.p., lightweight; cost 38 gns., sell 28 gns.; very little used, just suit young officer, no dealers.—Bishop, Clive, Salop. [X1303]

**2 h.p. Douglas**, good condition, new sprockets and chain, registered Nov. 1912, girder frame; £25.—Cooling, Joinery Works, Gainsborough. [X1401]

**24**, or near offer.—1912 Douglas, splendid condition, carefully used, lamp, horn, tools, footboards, etc.—11, Cowper Gardens, Wallington, Surrey. [6589]

**DOUGLAS**, 1913, T.T., 2 speeds, 1916 Amac, good tyres, 2 lamps, thoroughly sound condition; £29.—Rev. Wynne, Guestling Rectory, Hastings. [X1219]

**DOUGLAS** Specialists.—Gibb, Gough, London Rd., Gloucester. Gibb, the International Douglas rider, winner of numerous cups and gold medals. [1189]

**DOUGLAS**, 4 h.p., 1915 model A, 3 speeds, completely equipped, only run 2,000 miles, equal new, price £55; no offers; property of an officer.—The Morris Garages, Oxford. [0792]

**COLMORE** Depot, Birmingham, Manchester, Leicester and Liverpool, have in stock complete range of all models Douglas for immediate delivery, also full range of spares. [0800]

**1914 2½ h.p. Douglas**, 2-speed, and clutch, smart machine, in perfect order, all accessories, £40; also 1913 single speed Douglas, very fast, £22.—Clark, Mill House, Abingdon. [X1070]

**DOUGLAS** (1910), 2 speeds, Binks carburettor, F.R.S. lamp, horn, tools, spare, new back tyre, good running order; price £17/10.—Hunts, Ltd., 117, Long Acre, London, W.C. [X0775]

**DOUGLAS**, 1915, 4 h.p., T.T. model, countershaft 3-speed gear, Cowey speedometer, head lamp, tail lamp, and horn, in perfect condition throughout; £55.—The Premier Motor Co., Aston Rd., Birmingham. [6486]

**DOUGLAS**, T.T., 1913, I. of M. model, thoroughly overhauled, new tyres, long copper exhaust pipe, lamps, horn, spares, very sporty; £35, or nearest; owner under orders.—Corp. Shephard, 9th Hampshire, Bognor. [6482]

**DOUGLAS**, late 1914, 2½ h.p., 2-speed clutch, kick start, Wattford speedometer, lamps, horn, X-Fall saddle, tyres nearly new, just overhauled, engine perfect; £38, including insurance, 8 months unexpired.—Clark, 32, Albert Rd., Dalston, London. [6523]

**DOUGLAS** Motor Bicycles.—2½ h.p. models. We have one or two brand new latest pattern machines in stock for immediate delivery. The number is very limited, and further supplies are almost impossible to obtain. We therefore suggest you order from us at once and obtain instant delivery.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Tel.: 388. Grams' Bicycles. [6492]

## Elswick.

**1914 Elswick** Combination, 3-speed, spares, etc.; £36.—95, Douglas Rd., Tolworth, Surbiton. [6432]

## Enfield.

**ENFIELD** New 1916 6 h.p. Combination actually in stock; no waiting.—Moss, Wem. [X1326]

**COLMORE** Depot, 31, Colmore Row, Birmingham, for immediate delivery of Enfields. [0801]

**1916 Enfield** Combinations actually in stock, latest models.—Celtic Motor Works, East Hill, Wandsworth. [6398]

**ENFIELD** 6 h.p. Combination, new, latest 1916 model, actually in stock; price 65 gns.—The Morris Garages, Oxford. [0811]

**ENFIELD** Combination, in good condition, including tyres and accessories; £45, or near offer.—86, Rosebery Av., E.C. [6562]

**1914 Enfield** Combination, 6 h.p., fully equipped, beautiful condition; £58.—436, Whitehorse Rd., Thornton Heath. [6390]

**ENFIELD** Combination, 6 h.p., 2-speed, coachbuilt, all accessories; £45; perfect.—Leighton's, opposite Wood Green Station. [6258]

# Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone—766.

Telegrams—"Perfection."

## NEW MODELS.

**MORGANS**—Sporting and De Luxe Models in stock.  
**WILLIAMSON** Cy-el-ca, w.c. Douglas engine £126 0  
**RITZ** 4-cylinder Light Car ..... £145 0  
**CONNAUGHT** 4-seater, 12 h.p. .... £225 0  
**OVERLAND** 2½ h.p., 2-speed ..... £41 16  
**ROYAL RUBY** 2½ h.p., 2-speed, 2-stroke ..... £36 10  
**ROYAL RUBY** J.A.P., 2½ h.p., 2-speed ..... £39 10  
**ROYAL RUBY** 6 h.p., 3-speed ..... £87 0  
**U.S.A. EXCELSIOR** 7 h.p., dyn. lighting, &c ..... £71 0  
**LEVIS** 2½ h.p., 2-stroke ..... £75 0  
**EXCELSIOR** (American), 7 h.p., 2-speed ..... £75 0  
**NEW IMPERIAL** 2½ h.p., variable magneto ..... £39 0  
**REX** 6 h.p., kick start, and Rex Sidecar ..... £71 0  
**DOUGLAS MODELS**—orders booked now.

## (U.S.A.) EXCELSIOR,

7 h.p., 3-speed model, 34 × 89, countershaft gear, chain drive, mechanical and hand lubrication, high-tension magneto, multiple-disc clutch with dual control, kick starter, 2 gallons petrol capacity; £62. Or with electrical equipment; £71 10s.

Exchanges quoted. Easy Payments arranged.  
 Sole Yorkshire Distributors. Trade Supplied.

## PERFECTION SIDECARS

to suit B.S.A., SUNBEAM, and other standard machines, Dunlop tyre, body finished black and gold ..... £12 0

## SOLO MACHINES.

1913 3½ h.p. **ROVER**, 3-speed ..... £34 10  
 1913 3½ h.p. **R.E. RUDGE** ..... £26 10  
 1913 3½ h.p. **ROVER**, Grado gear ..... £27 10  
 1912 3½ h.p. **ZENITH TORPEDO** ..... £19 19  
 1912 3½ h.p. **ZENITH TORPEDO** ..... £26 10  
 1912 3½ h.p. **2-SP. BRADBURY**, chain drive ..... £26 10  
 1912 3½ h.p. **2-SP. F.E. HUMBER** ..... £26 10  
 1912 3½ h.p. **T.T. TRIUMPH**, very fast ..... £26 10  
**EXCELSIOR**, 3½ h.p., 3-speed, Druid forks ..... £17 10  
**KERRY**, 3 h.p. magneto, Saxon forks ..... £12 10  
 5½ h.p. magneto **REX**, spring forks ..... £12 10  
**N.S.U.**, twin, 2-speed, spring forks ..... £15 10  
**TRIUMPH**, magneto, new tyres ..... £12 10  
**REX**, 5½ h.p., 3-speed, wants attention ..... £27 10  
**P. & M.**, 3½ h.p., 2-speed, chain drive ..... £27 10  
**S.P.K.**, 3½ h.p., 3-speed countershaft ..... £25 10  
**REX**, 1910, 5-6 h.p., 2-speed, F.E. .... £22 10  
**REX**, 1909, 5-6 h.p., 2-speed, F.E. .... £18 10  
**REX**, 3½ h.p. magneto, spring forks ..... £11 15  
**DOUGLAS**, 2½ h.p. magneto, spring forks ..... £14 10  
**DOUGLAS**, 2½ h.p., 2-speed, wants attention ..... £18 10  
**TRIUMPH**, 3½ h.p., clutch model ..... £21 10

## SIDECAR COMBINATIONS.

1914 6 h.p. **ARIEL**, chain drive, and Sidecar ..... £45 0  
 1914 3½ h.p. 3-speed **ARNO** and Sidecar ..... £36 10  
 1914 6 h.p. **REX** Sidette, almost as new ..... £53 10  
 1913 6 h.p. **REX** Sidette, very smart ..... £43 10  
 1913 7-9 h.p. **QUADRANT** and Sidecar ..... £49 10  
 1912 3½ h.p. 2-speed **PREMIER** and Sidecar ..... £33 10  
 1910 3½ h.p. 2-speed **REX** and Sidecar ..... £24 10  
 3½ h.p. 2-speed **P. & M.** and Sidecar ..... £19 19  
**REX**, 3½ h.p., 2-speed, and Sidecar ..... £22 10  
**P. & M.**, 3½ h.p., 2-speed, and Sidecar ..... £18 18  
**CHATER-LEA**, 8 h.p., 3-speed, and Sidecar ..... £32 10

## MISCELLANEOUS.

1914-15 Grand Prix **MORGAN** and accessories ..... £98 10  
**MORGAN**, 1913, lamps, horn, screen, etc. .... £59 10  
**G.W.K.** 2-seater, all accessories ..... £92 10  
**ROVER** 5 h.p. 4-seater, all on, bargain ..... £39 10  
**RENO** 15 h.p. 4-cylinder Touring Car ..... £65 0  
**PREMIER** 7-9 h.p. 2-seater Light Car ..... £67 10  
 New Mechanical Horns ..... 17/6  
 New Acetylene Tail Lamp, post free ..... 1/4  
 Air Mudscraper, cost 21/-, take ..... 10/6  
 P. & H. Separate Generator Lamp ..... 17/6  
 Miller's late type Lamp Set ..... £1 4  
**REX**, 6 h.p., twin engine, magneto and carb. .... £9 10  
 8 h.p. Water-cooled Engine, fine condition. .... £4 10  
 5½ h.p. W.C. Engine, 2-speed, clutch ..... £5 10  
 3-wheel Cycle Car Chassis, 26×2½ wheels ..... £3 15  
 Cash Offers Solicited.

**WANTED.**—Second-hand 1913-1914 **DOUGLAS**, for Cash.

## MOTOR CYCLES FOR SALE.

### Enfield.

**ENFIELD** 1916 6h.p. Combination, delivery from stock; 85 gns. your present machine can be taken as part payment.—Below.

**ENFIELD** 1916 6h.p. Combination, dynamo lighting set, used for a few miles only, condition as new; cost £105 a few weeks ago, accept £90.—Elice and Co. 15-16, Bishopsgate Av., Cannonmile St., E.C. [0552]

**ENFIELD** Combination, 1915, dynamo electric lighting (Lucas), like new; £69-11, Luna Rd., Thornton Heath Clock, S.E. [6419]

**1916** 8h.p. Enfield Combinations; 2 actually in stock; £91/5. Easy payments if desired.—Jones, Garage, Broadway, Muswell Hill. [6594]

**1916** 2-speed Enfield, kick start, not ridden 200 miles, perfect condition; what offers?—Marshall, High St., Esher. Tel.: 50 Esher. [6421]

**ENFIELD** 1916 6h.p. Combination, latest model, just arrived from works; £89/5.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6330]

**ENFIELD**, 1914, 3h.p., excellent condition throughout, 1916 improvements, complete accessories; immediate, £35-58, Edgbaston Rd., Smethwick. [X1379]

**ENFIELD** Combination, 6h.p., late 1913, just overhauled, very smart and fast, all appurtenances. spare tyre.—P. Ward, Bescot, Wootton Rd., Abingdon [X1318]

**ENFIELD**, 1916, 3h.p., almost new, 400 miles, speedometer, lamps, etc.; bought car; £44.—Rev. Haslam, St. Mary's Cottage, Thames Ditton, Surrey. [6566]

**ENFIELD** actually in stock for immediate delivery. 6h.p. combinations, 3h.p. and 2½h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [X1338]

**ENFIELD** Combination, late 1915 model, just overhauled by firm; any trial; spares, lamps, etc.; joining colours; £65.—Batchelor, High St., Cradley Heath. [X1331]

**ENFIELD** 1913 6h.p. Combination, perfect running order, 2-speed, chain drive, Lucas lamps and horn; £38, bargain.—Taylor, 132, St. Alban's Av., Bedford Park, W. [6513]

**1915** Enfield Combination, speedometer, Millar lamps, double screen, cover, smart turnout, new condition, only done 1,200 miles; £67/10.—Wale, 62, Pasture Rd., Goolds. [X1378]

**ENFIELD**, 1916; immediate delivery of latest 6h.p. combination, now in stock; £89/5; make sure of this now.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6331]

**ROYAL** Enfields (3), about 1911, 2½h.p. twin mag.; £12/15, £14/10, £15/10 each; ready ride away.—Wandsworth Motor Exchange, Ebner St., Wandsworth Town Station, London. [X1410]

**ENFIELD**, 6h.p. combination £89/5, 3h.p. £52/10; liberal allowances on up-to-date outfits in exchange; generous deferred terms.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [6356]

**ENFIELD** 1916 Combinations.—We have them in stock; cash price £89/5. Exceptional exchange quotations; extended payment propositions of any reasonable character entertained.—Layton's Garage, Bicester, Oxon. [X1457]

### Excelsior.

**1915** American Excelsior Combination, 3-speed gear, dynamo lighting; £58.—Ajello, 35, Chenstow Crescent, Bayswater, W. [X0949]

**EXCELSIOR**, British 4½h.p. combination, 3-speed, with pleasure and business body; £48/10.—Bunting's Garage, Wealdstone. [6407]

**EXCELSIOR** (Coventry) Combination, big single, 5-6 h.p., 2 speeds, lamp, speedometer, horn, spares, in perfect condition, unused this year; £38-67, Tower Rd., Aston, Birmingham. [X1385]

### Fafnir.

**3½**h.p. Fafnir, sidecar (wicker), Chater frame, mag., 4 E. and B.; £16.—King, 111, Southampton St., Camberwell. [6590]

**MOTOR** Cycle, Fafnir, 3½h.p., and sidecar, 2-speed, free engine, in very good condition trial; just overhauled; £25.—Parvin, Builder, Mill Hill. [5686]

### F.N.

**F.N.**, 4½h.p., 4-cyl., good condition; £12, cheap.—58, Laburnum Rd., Wimbledon. [6509]

**F.N.**, 2½h.p., 2-speed, clutch, shaft drive, 1913, free from trouble, mount in perfect order; £22-130. Beulah Hill, Upper Norwood. [6586]

**F.N.**, 4-cyl., shaft drive, 2 speeds, hand clutch, Bosch mag.; seen running, bargain, £15; exchanged; Speechley, 45, Church Rd., Acton. [6601]

### Harley-Davidson.

**7-9**h.p. Harley-Davidson, only used 3 months; £56.—Parker and Son, St. Ives, Hunts. [6558]

**HARLEY-DAVIDSONS**, 1916 models in stock, also sidecars.—Pickering, Mardol, Shrewsbury. [X1418]

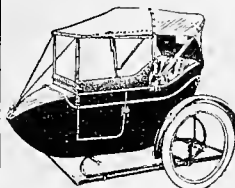
**HARLEY-DAVIDSONS**, 1916 models; immediate delivery from stock.—Colmore Depot, 261, Deansgate, Manchester. [6027]

**COLMORE** Depot, Birmingham, Manchester, Liverpool, Leicester, for immediate delivery of all models of Harley-Davidsons and spare parts. [0802]

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Built throughout in our own factory.

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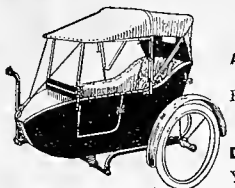


Model 1.  
 Underslung Chassis,  
 with Luggage Carrier  
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Splendidly made and  
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£11 0 0

Hood ..... £2 4  
 Screen ..... £1 0



This is  
 MODEL No. 2.

A BEAUTIFUL LIGHT  
 SIDECAR.

PRICE ..... £10

Hood £2 4s. Screen £1.

Delivery from Stock.  
 Your Agent will supply

## The following New Models are all in Stock:

1916 4 h.p. A.J.S. Combination, interchangeable wheels, very fine ..... 90 gns.  
 1916 6 h.p. **ENFIELD** Combination ..... 85 gns.  
 1916 8 h.p. **ENFIELD** Combination ..... 87 gns.  
 1916 6 h.p. **J.H.** Combination ..... 90 gns.  
 1916 6 h.p. **NEW HUDSON** Combination ..... 88 gns.  
 1916 2½ h.p. **NEW HUDSON**, 2-sp., 2-stroke ..... £38 0  
 1916 2½ h.p. **OMEGA**-J.A.P., 2-speed ..... 38 gns.  
 1916 2½ h.p. **OMEGA**, 2-stroke, 2-speed ..... 38 gns.  
 1916 5-6 h.p. British **EXCELSIOR**, Sturmer countershaft 3-speed gear ..... 68 gns.  
 1916 4½ h.p. British **EXCELSIOR**, Sturmer countershaft 3-speed gear ..... 64 gns.  
 1916 **FORD** Touring Car, 20 h.p. .... £135 0  
 1916 **FORD** Chassis, 20 h.p. .... £115 0  
 1916 **FORD** Van, 20 h.p. .... £130 0  
 1916 20 h.p. **FORD** Ambulance ..... £135 0  
 1915 12 h.p. **TRUMBULL** Cycle Car, 4-cyl., water-cooled, detachable wheels, all on ..... £120 0

## CASH OFFERS WANTED.

4 h.p. **BRADBURY**, 2-speed, kick starter ..... £20 0  
 1914 6 h.p. **ENFIELD** Combination, Lucas lamps, speedometer, horn, etc. .... £60 0  
 1914 6 h.p. **ENFIELD** Combination, Miller's lamp, etc. .... £60 0  
 3½ h.p. **HUMBER**, 2 speeds, fine gear ..... £20 0  
 4 h.p. **BRADBURY**, single gear, and Sidecar ..... £16 0  
 1913 **SCOTT**, lamp, speedometer, etc. .... £310 0  
 1915 **WOLF**, lightweight, 3-speed ..... £225 0  
 2-speed **RADCO**, 2-stroke, fine condition ..... £225 0  
 2-stroke **OMEGA**, Druid forks ..... £19 0  
 1913 **DOUGLAS**, 2-speed, fine machine ..... £36 0  
 3½ h.p. **N.S.U.**, spring frame, 2-speed ..... £17 0  
 3½ h.p. 1908 **TRIUMPH**, fine gear ..... £17 0  
 3½ h.p. 1909 **REX** de Luxe, 2-speed, handle starting ..... £19 0  
 1913 **FORD**, English body, Bosch magneto, disc wheels ..... £84 0



## NEW MOTOR CYCLE FRAMES.

Fully Guaranteed.  
 25/- each.

## ODD BARGAINS.

Nice Coach-built Sidecar ..... £4 0  
 Canoelet Sidecar, very fine ..... £8 0  
 New 650×65 Dunlop Rubber-studded Covers ..... 22/6  
 8-10 h.p. Precision Engine, quite new. What Offers? ..... £6 0  
 6 h.p. Twin Antoine Engine, water-cooled ..... £4 10  
 6 h.p. Sorella Twin Engine ..... £4 10  
 F.R.S. Lamp Set, 500 beam, shop-soiled ..... 35/-  
 F.R.S. Lamp Set, 1,000 beam, shop-soiled ..... 45/-  
 New Clincher Clearance Covers, de Luxe, "heavy," rubber-studded, 26×2½, 26×2½, 26×2½, and 26×2½×2½ ..... each £1 0

## FARRAR'S MOTORS

(Telephone 919)

Hopwood Lane, HALIFAX.

## MOTOR CYCLES FOR SALE.

## Harley-Davidson.

**BRAND** New Harley-Davidsons.—See below.

**MODEL F.** 7-9h.p., 3-speed; £68.—The Premier Motor Co.

**MODEL J.** 7-9h.p., 3-speed, with dynamo electric lighting outfit; £75.—The Premier Motor Co.

**THE** Above are guaranteed brand new; standard specification and standard equipment.—The Premier Motor Co., Birmingham.

**SPECIAL** Gloria Sidecars, to match; 19 and 25 gns. You save £17 by purchasing your new combination direct from the recognised H.D. experts. Delivery carriage paid to any address.—The Premier Motor Co. Aston Rd., Birmingham. [X4467]

**HARLEY-DAVIDSON** 1915, with Bramble C.B. sidecar, £50; 800 miles like new, complete tool kit, Klaxon.—Lieut. Hilliar, R.F.C., Farnborough. [6372]

**MODEL J** 7-9h.p. Harley-Davidson, 3-speed, with dynamo electric lighting outfit, and 17 in. Canoelet sidecar, brand new, having done 25 miles only; £85 to clear.—Apply, L1522, c/o The Motor Cycle. [6313]

**HARLEY-DAVIDSON** 1915 Combination, Mills-Fulford 416/16 sidecar, painted grey to match machine, new Dunlop heavy tyre, horn and accessories; £73.—Vincent Motors, Rangleys, Stuffs. [X1423]

**1916** Harley-Davidson, Swan sporting sidecar, 3 speeds, clutch, kick start, mechanical horn, head lights, run under 300 miles, speedometer; a bargain, £85.—Motor Mart, 56, Terminus Rd., Eastbourne. [6320]

**HARLEY-DAVIDSON** Electric Model 289, or standard £80/15; delivered from stock; also sidecars to suit; good allowances on up-to-date machines, and deferred payments to suit individual requirements.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [6358]

## Henderson.

**HENDERSON**, 4-cyl., 1913, grand condition; £27.—Forinton, 220, Wickham Lane, Plumstead. [6455]

**HENDERSON**, 1915, 4-cyl., short wheelbase model, T.T. bars, coach sidecar, complete; £69.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

## Hobart.

**HOBART-VILLIERS**, 1915, 2½h.p., a very sturdy little mount; accept £21, real bargain.—Lavtons' Garage, Bicester, Oxon. [X1458]

**HOBART**, latest 1916 2½h.p. 2-speed 2-stroke Villiers engine, countershaft drive, controlled from handlebars, all-black finish, delivery from stock; exchanges or extended terms.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0480]

## Humber.

**HUMBER**, 1913, 2h.p., splendid running order, new condition; 13 gns., or near offer.—Box 499, c/o The Motor Cycle. [X1240]

**3h.p.** Humber, chain drive, low, powerful, perfect condition, lamps; £8, no offers.—Scargill, Ings, Thornhill, Dewsbury, Yorks. [6374]

**1913** 2½h.p. Humber, clutch model, new tyres and belt, in good order; a bargain, £17/10.—Jones, Garage, Broadway, Muswell Hill. [5935]

**3h.p.** Humber, 2-speed, and sidecar, engine and speeds 2 been overhauled by makers; bargain, £28.—A. Wood, 48, High St., Windsor. [6315]

**1912½** Humber, 3½h.p., 2-speed, handle starter, nearly new tyres, accessories; £16/10.—5, Forester St., Canal Rd., Mile End Rd., E. [6603]

**1913** 3½h.p. Humber, 2-speed, free, handle starting, sidecar, 24 gns.; 1912½ countershaft Douglas, 19 gns.—31, Nursery Row, Waltham, S.E. [X0452]

**1912** 3½h.p. Humber, 2-speed, good condition, recently overhauled, owner enlisted; £22.—Herbert Holmwood, Canterbury Rd., Leyton. [6410]

**1912** Humber, 3½h.p., Montgomery sidecar, 2 speeds, handle starter, good condition, new tyres; £34, or offer.—Goodwin, 28, Claremont Sq., Pentonville. [6402]

**HUMBER**, 3½h.p., 1912, 2-speed, handle starting, tyres perfect, good running order, used by owner only, with sidecar, £25.—Ladson, Builder, Cullumpton. [6442]

**3h.p.** Humber, 3-speed, S.A. gear, 1915, only sold up; price £50.—Leighton's, opposite Wood Green Station. [6461]

**HUMBER**, 1915, lightweight, 2½h.p., 2-speed countershaft gear and clutch, Bosch mag., B. and B. carburettor; price £20.—The Nook, Maney Hill Rd., Sutton Coldfield. [X1448]

**HUMBER**, late 1911, 3½h.p., 2-speed, nearly new tyres, enamel and plating as new, head lamp, tail lamp, and horn, complete with Montgomery sidecar; £20.—The Premier Motor Co., Aston Rd., Birmingham. [6487]

## Indian.

**INDIAN**, new 1916 5h.p. model actually in stock, no waiting.—Moss, Wem. [X1328]

**INDIAN**, late 1912, 2-speed, perfect condition, new Dunlop; £37/10.—Gibson, Surveyor, Windermer. [X1275]

**1914** Hendee Special Indian, complete as new, motor, £40; exchange Douglas or A.J.S.—Box 601, c/o The Motor Cycle. (D) [X1345]

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" 2½	h.p. ALLDAYS ALLON	2-str. 2-stroke	£42 0
" 180.	6 h.p. ROYAL ENFIELD	Sidecar Combination	£89 5
" II.	2½ h.p. COVENTRY EAGLE	2-sp gear, 2-stroke	£44 2
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" 2½	h.p. CALTHORPE lady's	2-sp. Einfield, 2-stroke, vari. ignition	£35 14
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" 2½	h.p. LEVIS	2-stroke	£32 0
" 4.	h.p. NEW IMPERIAL	light tourist, lady's model	£46 8
" 1.	2½ h.p. NEW IMPERIAL	light tourist, 2-speed, vari. ignition	£32 0
" H.	4½ h.p. B.S.A.	3-sp., chain drive	£94 0

## 1915 Models—New Machines.

2½ h.p. CALTHORPE J.A.P.	2 sp., fixed ign.	£34 0
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2½ h.p. NEW IMPERIAL	light tourist, single-speed	£30 0

## Second-Hand Guaranteed Machines.

1913 2½ h.p. DOUGLAS	2-speed	£37 10
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1913 6 h.p. MATCHLESS	3-speed	£38 0
1914 7 h.p. INDIAN	road racer, accessories	£42 0
1914 7 h.p. INDIAN	2-speed, elec. equipped	£48 0
1915 3½ h.p. HUMBER	3-speed, kick starter	£48 0
Or with Sidecar		£57 0
1914 7 h.p. INDIAN	2-speed, speedometer, with 10½ pattern kick starter	£50 0
1914 7 h.p. HENDEE Special	elec. equipped	£50 0
Or with coach-built Sidecar		£65 0
1915 7 h.p. INDIAN	road racer	£52 0
1915 5 h.p. INDIAN	3-speed	£56 0
1915 7 h.p. INDIAN	3-speed, kick starter	£58 0
1915 5 h.p. INDIAN	3-speed	£58 0
1915 3½ h.p. P. and M. War Office Model	2-speed, kick starter	£59 0
Or with new Millford skiff Sidecar		£72 10
1915 7 h.p. INDIAN	3-speed, elec. equipped	£64 0
*1914 6 h.p. ROYALENFIELD	Sidecar Combination, 2-speed, handle starter and accessories	£65 0
1916 7 h.p. INDIAN	Model G, 3-sp., kick starter, as new	£72 0
1915 7 h.p. INDIAN	3-speed, kick starter, elec. equipped, Empress coach-built S'car	£78 0
*1915 7 h.p. INDIAN	3-speed, kick starter, elec. equipped, Indian coach-built Sidecar	£78 0
*1915 7 h.p. MATCHLESS	M.A.G. engine, 3-speed gear, kick starter, and Matchless coach-built Sidecar, complete with Lucas dynamo set, including head lamp, sidecar lamp, and tail lamp	£85 0

\*Sidecar combinations.

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## MOTOR CYCLES FOR SALE.

## Indian.

**1916** Model F 3-speed Powerplus Indian Combination; cost £111; ridden 50 miles; offers.—Willson, 22a, Princes Sq., Bayswater. [6462]

**INDIAN**, 1914, 7-9h.p., T.T. model, clutch, extra fine condition, speedometer, mechanical horn; £35.—Layton's Garage, Bicester, Oxon. [X1462]

**INDIAN** Combination, sporting, 1912, 3½h.p., 2-speed clutch, electric lamps, perfect, spare, £29, exchange offers.—Croft, 7, Bedwell St. Peckham. [6368]

**INDIAN**, 1916 latest models in stock; your present machine can be taken as part payment.—Elice and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0481]

**INDIAN**, clutch, 5h.p., Kempshalls, excellent condition, mechanically sound; inspection invited after 7; £33, near offer.—109, Horsa Rd., Erith, Kent. [6458]

**INDIAN**, new end February, 1916, 8h.p., side by side valves, lamp, mechanical horn, etc.; £60 cash.—G. N. Higgs, 31, Vauxhall Bridge Rd., Victoria, S.W. [6277]

**5h.p.** Indian, 1916 pattern, complete with accessories, not ridden 200 miles, perfect condition, owner fighting; lowest £55.—C. Wigg, 31, Bow St., W.C. [6589]

**INDIAN**, 1914, standard model, 7h.p., spring frame, speeds, P. and H. head light, mileage 4,100, splendid condition; £45.—Barker, Jack of Newbury, Binfield, Berks. [X1258]

**INDIAN**, 5-8h.p., and standard coachbuilt sidecar, clutch, accessories, perfect order, condition as new; wants seeing; bargain, £27.—130, Beulah Hill, Upper Norwood. [6587]

**OFFERS** wanted for 1915 Indian, 5h.p., 3 speeds, Kick starter, fully equipped, small mileage, appearance and condition good as new.—Groom, Hazelmere, Stonegate, Spalding. [6261]

**INDIANS**, all 1916 models, ex-stock, with and without sidecars; exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6565]

**BRAND** New 1915 5h.p. Indian, 3-speed clutch, done 600 miles solo work, unscratched, all accessories, owner in France; cost £75, first £60 gets it.—Rector, Fittingly, Doncaster. [6345]

**1916** 5h.p. Indian, new February, 3-speed, kick start, electrically equipped, speedometer, Mills-Fulford sidecar, run 1,700 miles; cost £95, accept £72/10.—L1535, c/o The Motor Cycle. [6597]

**LATE** 1915 Indian, 7-9h.p., 3 speeds, speedometer, electric lighting throughout, Millford sidecar, wind screen, absolutely new condition; £80; death cause of sale.—Mrs. Lisle, Bitterne Park, Southampton. [6446]

**INDIAN** 1916 (May) Combination, 7h.p. Powerplus model, spring frame, 3-speed gear, full electrical equipment (including 2 head lights), clutch hand and foot controlled, mechanical lubrication; £96.—Maddock, Oakengates. [X1365]

**1915** Indian Model C, 7h.p., 3-speed, electrically equipped, speedometer, T.T. and touring bars, Millford sidecar, wind screen, spare Kempshall and tube, 2 spare chains, tyres unpunctured, tools, and lot of spares; take £80, or nearest offer.—47, Cambridge Rd., E. [6456]

**INDIAN**, almost new 1916 Powerplus model, spring frame and Splitdorf dynamo lighting, Godfrey's best quality sidecar, only done 375 miles; cost £111, special bargain at £95; only wants seeing.—Maudes' Motor Mart, 100, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6582]

**INDIANS** in Stock.—Latest models, Powerplus combinations, sporting Powerplus 3 speeds models, standard 7h.p. overhead inlet combinations, with lighting set, the famous 5h.p. 3-speed double-purpose mount, and 7-9h.p. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [X1334]

## Ivy.

**1915** 2½h.p. 2-stroke Ivy, Lucas lamps, horn, Dunlop tyres (unpunctured); nearest £20.—Box 502, c/o The Motor Cycle. [X1346]

**IVY** 2½h.p. 2-stroke 1914 Model, U.H. mag, spring forks, complete, ready for the road, with lamps and horn; £15.—Maudes' Motor Mart, 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6580]

## James.

**1913** James and Sidecar, complete; £39.—Cross, Effingham Sq., Rotherham. [X1427]

**JAMES** No. 6 Combinations in stock; no waiting.—Colmore Depot, 261, Deansgate, Manchester. [6026]

**COLMORE** Depot, 261, Deansgate, Manchester, have in stock complete range of James motor cycles. [0803]

**JAMES**, 4½h.p., 3-speed countershaft, cane sidecar, fine order; £42.—Collyer, 286, High Rd., Wood Green. [X1241]

**1914** James, 4½h.p., 3 speeds, kick starter, all in good condition; £37/10, offer.—455, York Rd., Wadsworth. [6441]

**1916** 3½h.p. Twin James, 3 speeds; cost £70; sell, exchange with cash for combination.—Tippett, Arlington Rd., Surbiton. [6431]

**LATE** James, 4½h.p., countershaft gear, splendid condition, accessories; £32, close offer.—Jones, 7 Wastdale Rd., Forest Hill. [6369]

## MOTOR CYCLES FOR SALE.

James.

1914 James Combination, under 6,000 miles, condition like new; bargain, £50.—Borsman, Mount Cottage, Grayshott, Hindhead, Surrey. [6371]

1915 3½ h.p. Twin James, 5-speed countershaft gear, chain drive, original Palmer cord tyres, very little worn, lamp, horn, and tools, in perfect order; £45.—Walbro Motor Co., Saffron Walden, Essex. 'Phone: 45. [X1437]

1915 T.T. James 3½ h.p. Twin, special engine, 3 speeds, Binks carburettor, Lucas lamp, horn, generator, Watford trip, spare T.T. bars, 3 sprockets, chains, touring silencer, valve T.T. pipes; £47.—9, Granville Rd., Fallowfield, Manchester. [X1444]

J.E.S.

J.E.S., in splendid order and condition; £12/10, bargain.—Brookes, 90, Burton Rd., Lincoln. [X1368]

J.E.S. (1914), 1½ h.p., 3-speed, tyres and condition excellent; £10.—29, Tintagel Crescent, East Dulwich. 'Phone: 935 New Cross. [6338]

J.H.

J.H., brand new 6 h.p. model, M.A.G. engine, Sturmer-Archer 3-speed countershaft gear, oil chain drive, complete with best model Canoelet sidecar, with hood and screen; list price practically £100; to clear at £82/10.—Maudes' Motor Mart, 100, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6581]

Kerry.

3½ h.p. Kerry-Abingdon Motor Cycle and strong cane 2½ sidecar, in good order; £25, exceptional bargain.—Vilcher, Braintree. [6438]

KERRY, 3½ h.p., 2 speeds, and free engine, handle start, Bosch mag., handle-bar controlled carburettor; a bargain, £15.—Maudes' Motor Mart, 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6574]

Levis.

LEVIS, 1915 (July), in perfect order; £23.—Adams, Rillington, York. [X1259]

LEVIS, new 1916 Popular model actually in stock; no waiting.—Moss, Wem. [X1327]

1916 Levis Popular; £32; in stock.—Williams, Chapel Ash Depot, Wolverhampton. [X1391]

LEVIS Popular, 1915, new condition; £24.—Thursby, 53, Grand Parade, Harringay, N. [6505]

1916 Popular Levis, as new, scarcely 100 miles; 27 gms.—David, Holmesdale, South Darenth, Kent. [X1309]

COLMORE Depots, Birmingham and Leicester, for delivery of all models of Levis motor cycles from stock. [0804]

LEVIS Popular, or new model E.C., immediate delivery; easy terms 2½ extra.—Refetee Cycle Co., 332, High Holborn. [0764]

LEVIS Popular, 1915, P. and H. lamp set, overalls, and accessories; £21.—Kennett, 29, Millman St., Bloomsbury, W.C. [X1402]

LEVIS, 1916, 2½ h.p., Lucas lamp set, Lucas rear, large horn, ridden about 50 miles; £32.—Walbro Motor Co., Ely, Cambs. [X1469]

LEVIS, 1915, 2½ h.p., 2-speed, perfect condition, new front lamp, all accessories; £25.—Easton, 44, Windermere Av., Brondesbury. [6265]

LATE 1915 Popular Levis, only 3 months' wear, topping hill-climber, perfect condition; £25.—Write, J. Chuter, 172, Piccadilly, W. [6272]

LEVIS, 2½ h.p., speedometer, and all accessories, perfect condition; £28, cost over £40.—18, De Crespigny Park, Denmark Hill, S.E. [6298]

LEVIS Popular Model, new, but slightly shop-soiled; special bargain, £25/17/6.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6329]

LEVIS, 1916, Popular models.—We are sole Oxfordshire agents, and can deliver correctly tuned Popular models at once.—Layton's Garage, Bicester, Oxon. [X1464]

LEVIS Popular, latest 1916 models, ex-actual stock; exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6566]

LEVIS 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents. Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., London, W.C. 'Phone: 1432 Regent. [0711]

LEVIS Popular, £32, No. 1's with Enfield gear £47/10; actually in stock; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [6355]

1915 2½ h.p. Levis 2-stroke, nearly new tyres, front and rear lamps, mechanical horn, 2 toolbags, all spares, engine guaranteed perfect; £23/10.—Robinson's Garage, Green St., Cambridge. [6493]

L.M.C.

L.M.C. Combination, C.B. sidecar, 4 h.p., 2-speed countershaft, kick start, almost new tyres, just overhauled by expert, guaranteed in perfect condition; £33, no offers.—321, Ivydale Rd., Peckham, S.E. [6337]

Lugton.

1913 3½ h.p. Lugton, 1916 engine, P.M. lamp, R.B., Bosch, splendid condition; any trial; genuine bargain, £25.—Davis, 4, Glynhafod, Cwmaman, Aberdare. [X1264]

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THE THURO-PROOF MOTOR CYCLE SUIT.



There is no value offered to-day to equal this Suit. Coat and Trousers complete, made from extra strong dark fawn twill, double texture, with guaranteed rubber proofing. Double breasted Coat, 36 in. long, storm collar, two side pockets, adjustable elastic inner cuffs.

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OVERALLS.—Legging shape, spat fitting fronts, spring buttons, fastening at sides.

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Best Quality .. 15/9

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From double-texture proofed material. Inside leg measure from 30 in. to 36 in. A clearing line at 15/- per pair, worth 21/- 10 pairs FULL SEATFD ditto 16/8, worth 25/- Inside leg measure only required.

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In Black, Brown, and Yellow, 18/6 and 25/- State Chest measure.

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In strong Derby and Yorkshire Grey Tweeds.

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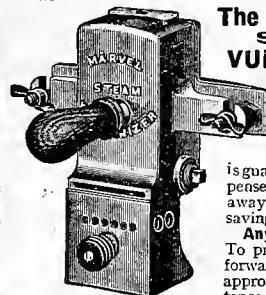
6 h.p. A.J.S. Combination .....	£102 18
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2½ h.p. 2-str. EXCELSIOR, 2-sp., and clutch .....	£44 2
Coach-built Sidecar for same .....	£10 10
8 h.p. British EXCELSIOR, 3-speed .....	£78 15
2½ h.p. ALLONS, 2-speed .....	£42 0
4 h.p. GALTHORPE Combination .....	£70 7
6 h.p. ENFIELD Combination .....	£89 5
2½ h.p. GALTHORPE J.A.P., 2-speed .....	£37 16
2½ h.p. GALTHORPE, 2-stroke, 2-speed .....	£32 11
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1915 4 h.p. B.S.A., Mod. H 50 0				
1914 6 h.p. A.J.S. and Canoelet, hood and screen .....	70 0	25 0	80/8	
1914 8 h.p. ZENITH, c/shaft, and Sidecar ..	62 0	18 0	73/10	
Mod. J 7-g.h.p. HARLEY-DAVIDSON, electric equipment, new; cost £86 13s. ....	76 13	26 13	89/7	
1913 3½ h.p. ARIEL, 3-sp. and Sidecar .....	40 0	10 0	53/9	
1914 3½ h.p. SUNBEAM, 3-speed, and Sidecar ..	65 0	25 0	71/8	
1914 8 h.p. BAT and S'car ..	55 0	15 10	71/8	
1915 4½ h.p. EXCELSIOR, soiled only .....	59 0			
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## Martin.

MARTIN-J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear, £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [0760]

## Matchless.

MATCHLESS, 4h.p., new Bosch, and new tyres, all in good condition; £17/10.—455, York Rd., Wandsworth. [6440]

MATCHLESS, 8h.p., late 1913 combination, G.K. De Luxe sidcar, underslung, Jones speedometer; 55 gns.—Richards, 25, Pembroke Rd., Walthamstow. [X1422]

MATCHLESS, 8h.p., 1913, with 2-seater sidcar, fast, powerful and slight, practically new, all new tyres May, 1916, price £60, no offers.—Woollett, 19, Queen's Rd., Peckham. [6353]

MATCHLESS, 1913, twin J.A.P., 2-speed, with Dunhill coachbuilt, 2-seater, sidcar, fine passenger outfit, recently overhauled; worth easily £50, accept £42.—Layton's Garage, Bicester, Oxon. [X1429]

MATCHLESS-J.A.P., 4h.p., N.S.U. 2-speed and free, Bosch mag., Premier wicker sidcar, new drop chassis, excellent condition, accessories, overalls, etc.; £20.—Appointment, 110a, Kingswood Rd., Brixton Hill. [X1276]

MATCHLESS, 1915, J.A.P. twin, 6h.p., overhead valves, T.T. sporting model, in excellent condition throughout, new tyres, good belt, very little used; £40; ideal mount for officer or despatch rider.—Sundall, 16 Ipswich Rd., Lowestoft. [X1302]

MATCHLESS 1914 8h.p. Combination, M.A.G. engine, fitted with Lucas dynamo lighting system and 3 lamps, Watford speedometer, excellent order throughout; £78, a bargain.—Maudes Motor Mart, 100, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6585]

## Moto-Reve.

MOTO-REVE, 2½h.p., Bosch, Druids, good tyres, excellent condition; a sacrifice, £8.—W. H. Bracewell, Cavendish Rd., Morecambe. [X1416]

TWIN Moto-Reve, mag., lightweight, exceptionally good condition, new back tyre, Palmer front; immediate cash £8/15.—2, North Rd., Birkenhead. [X1067]

## Motosacoché.

3½h.p. 1913 Motosacoché, Enfield 2-speed gear; 27 gns.—Troward, 78, High St., Hampstead. 'Phone: 5392. [6475]

MOTOSACOCHE, 2h.p., B. and B., 1916, mag., Dunlops, just overhauled; £12; trial afternoons.—Ross, 304, Hanworth Rd., Hounslow. [6503]

1912 Motosacoché, 2½h.p., with handle-bar control, variable pulley, mud screen, Whittle, spare tyres, valves, good condition.—J. Everatt, 89, Saltergate, Chesterfield. [6561]

MOTOSACOCHE, 1914, 3½h.p., chain drive, 2-speed, De Lissa valves, kick starter, lamp, and horn, perfect condition; cost £65, accept £35.—33, Beethoven St., West Kilburn, W. [X1305]

## New Hudson.

1912 New Hudson, 2½h.p., nearly new; £32.—Cooper, 512, Old Kent Rd., London. [6397]

NEW Hudson Coachbuilt Combination, 3-speed, kick starter; £29/10.—Apply, 107, Bensham Lane, Croydon. [6308]

3½h.p. 1913 New Hudson, Multi gear, etc., good condition, all accessories; £27.—37, Hamilton Rd., Walthamstow. [6507]

1915 New Hudson, 2-speed, 2-stroke, perfect; £27; approval.—Thompson, Westleigh, Carnarvon Rd., Clacton-on-Sea. [6547]

1913 New Hudson, 3½h.p., 3-speed, chain-cum-belt, coach sidcar; £32/10, or offer.—Hammett, Watchmaker, Riscan, Mon. [X1321]

NEW Hudson, J.A.P. engine, 2½h.p., in good running order; £15, or nearest offer.—T. F. Powell, Great Berwick, Shrewsbury. [X1274]

NEW Hudson, 2½h.p., 3-speed, in perfect condition; price £26/10.—21, R.F.C. Quarters, Lynchford Rd., South Farnborough, Hants. [6411]

NEW Hudson, 2½h.p., 1914, 3-speed and clutch, accessories new heavy Dunlop on rear; £25.—Pidcock, St. Bartholomew's Hospital, E.C. [6514]

6-h.p. New Hudson Combination, nearly new, all accessories; £60, or best offer.—Full particulars, Lloyd Huntington, Kingston, Herefordshire. [X1356]

NEW Hudson Big Six Combination 192/8, model C 2-speed £28, Model de Luxe £42; all actually from stock; deferred payments and exchanges entertained.—Lamb's, 151 High St., Walthamstow, and 50, High Rd., Wood Green. [6359]

NEW Hudson, 1915, 2½h.p., 2-stroke lightweight, De Luxe model, with countershaft 2-speed gear, Druid spring forks, X'fall saddle, Dunlop tyres, Lucas lamp, horn, tail lamp, etc., condition as new; a bargain, £35.—The Premier Motor Co., Aston Rd., Birmingham. [6489]

## New Imperial.

NEW Imperial-Jap, 1916 models, in stock; £38 and £44 8.—Craw Bros., Guildford. [6450]

COLMORE Depots, Manchester and Leicester, for immediate delivery of New Imperial motor cycles. [60805]



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7-gh.p. Harley-Davidson, Sidcar, 16F £101 15  
7-gh.p. Harley-Davidson, solo model .. £80 15  
7-gh.p. Harley-Davidson, elec., Sidcar £110 0  
7-gh.p. Harley-Davidson, elec., solo .. £89 0  
6 h.p. Enfield Com., hood and screen £96 10  
6 h.p. Enfield Tradesman's Carrier .. £89 5  
(box alone 15 gns.)

4½ h.p. B.S.A., chain drive .. £64 0  
4½ h.p. B.S.A., belt-cum-chain .. £62 0  
5 h.p. Indian Com. (m/c alone £70) .. £86 10  
7-gh.p. Indian Powerplus, Model G .. £75 0  
7-gh.p. Indian Powerplus, elec., S'car £106 10  
6 h.p. New Hudson Com., fawn finish £92 8  
2½ h.p. Lewis Popular .. £32 0  
2½ h.p. Lewis, 2-speed, Model E .. £47 10  
2½ h.p. Calthorpe-Jap, 2-sp. Enfield gear £37 16  
2½ h.p. Alldays Allon .. £36 0  
2½ h.p. Alldays Allon, 2-speed model .. £42 0  
2½ h.p. Alldays Allon, 2-speed, clutch .. £45 0  
2½ h.p. New Hudson, Model C .. £38 0  
2½ h.p. New Hudson, Model de Luxe .. £42 0  
2½ h.p. New Imperial light tourist, 2-sp. £38 0  
2½ h.p. New Imperial, 2-sp., kick starter £44 8

## NEW 1915 MODELS (SHOP-SOILED ONLY).

Reduced to clear  
2½ h.p. Calthorpe, 2-speed, 2-stroke .. £32 0  
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## SECOND-HANDS.

3½ h.p. Norton, 1914, T.T. model .. £37 10  
7-gh.p. Harley-Davidson, 1915, elec., Sc. £68 10  
6 h.p. Bradbury, 1914, 3-sp., Sc., access £57 10  
4½ h.p. B.S.A., 1915, c/shaft gear, access £48 10  
7-gh.p. Harley-Davidson, 1915, Sc., elec. £69 10  
3½ h.p. New Hudson, 3-sp., coach Scar £31 10  
2½ h.p. Service-Precision, 1913, access. £18 10  
4½ h.p. B.S.A., 1912, 2-speed, access. .. £32 10  
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2½ h.p. New Hudson-Jap, 3-speed .. £21 0  
5 h.p. Indian 1916 3-sp. Com., soiled £79 10  
6 h.p. Zenith-Gaiolet Com., Gradua. £59 10  
1 h.p. Auto-wheel, 1914 .. £5 10  
Chater-Lea Tandem, lady-back, 22-24" £28 10  
3½ h.p. P. & M., 1913, 2-speed .. £42 0  
2½ h.p. Lewis Popular, and accessories £24 0  
2½ h.p. Calthorpe-Jap, Enfield gear .. £28 10

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Carriage paid, crate free, or fitted free.  
Ganeolet, for H.-Davidson, 28" wheel .. £17 10  
C.K., for H.D. .... £15 15  
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Phoenix, all red, for Indian .. £15 15  
Swan de Luxe, hood and screen .. £21 0  
Watsonian, Model N, for 2½ h.p. .... £12 1  
Watsonian, Model H, for 3½ h.p. .... £11 10  
Watsonian, Model G, for 2½ h.p. .... £10 16  
Watsonian, Model F, for 2½ h.p. .... £9 3  
Watsonian, Model E, for 2½ h.p. .... £7 12  
Enfield 1916 Body, new .. £4 10

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Ford (new Nov., 1915), rear w/n screen, shock absorbers back and front, sight oil, Stepnay wheel and tyre, speedometer, exhaust whistle and syren, special running boards and tool chest, oil lamps. Very carefully used £128 10  
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Crouch 8-10 h.p. 2-seater, accessories .. £59 10  
Saxon 1915 2-seater, water-cooled .. £110 0  
Rover 6 h.p. 2-seater and accessories .. £30 0

DEFERRED PAYMENTS 5% extra, payable quarter down, balance in monthly instalments. Substantial discounts if cleared in 1, 3, or 6 months.

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## MOTOR CYCLES FOR SALE.

## New Imperial.

IMPERIAL-J.A.P., 1916, latest model, 2-speed, in stock; £38.—Layton's Garage, Bicester, Oxon. [X1459]

NEW Imperial, light tourist, immediate delivery; cash or easy terms.—Referee Cycle Co., 332, High Holborn. [0765]

NEW Imperial-Jap, 2½h.p., 2-speed, splendid condition; £26, near offer.—Archer, Tackley Place, Oxford. [X1342]

NEW Imperials, latest models in stock; 2-speed, also kick-starter band-controlled clutch models.—P. J. Evans, John Bright St., Birmingham. [X1333]

NEW Imperial-Jap, light tourist, 2-speed, new, but slightly shop-soiled; special bargain, £30/15.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6328]

## New Ryder.

NEW Ryder-Jap, 1915, 2-speed; £26.—Troward, 78, High St., Hampstead. 'Phone: 5392. [6472]

## Norton.

1916 3½h.p. Norton T.T., just delivered; £52/10.—Parker and Son, St. Ives, Hants. [6559]

## N.S.U.

N.S.U. Coachbuilt Combination, 6h.p., 2 speeds, free, kick start, good running order; £18/10.—Bramley, Charlton Rd., Shepperton-on-Thames. [6443]

N.S.U. 2-speed Gears in stock, latest English model, adjustable pulley, 27/17/6, fixed 27/7; send pulley with order; Albion 2-speed countershaft, with our special bottom bridge, 27; motor frames, forks, etc.; lightweight motor cycles, latest aloping model, complete, less power unit, £13/15.—Pilot Motors, 88, John Bright St., Birmingham. [X1377]

## N.U.T.

8h.p. N.U.T., 1915, T.T. model, J.A.P. engine, overhead valves, horn, tools, etc., practically new, done 600; owner goes India; cost £65, sell £35 cash.—Day, Okehampton. [X1441]

T.T. N.U.T., 2½h.p. twin, 1915, 3 speeds, F.R.S. lamps, speedometer, horn, used 600 miles, unscratched, very fast and sporty, perfect condition; must sell; owner under orders; £48, or offer.—Sergt. Carter, 9th Hants, Bognor. [6483]

FOR Sale, N.U.T. combination, 5h.p. twin, M.A.G. engine, cycle made in August, 1914, 3 speeds, clutch, kick starter, sidcar new August, 1915, hood, wind screen, luggage rack, also speedometer, and head Lucas lamp, not done 1,000 miles.—Apply, Baker, Newagent, Eden Crescent, West Auckland, Co. Durham. [X1262]

## O.K.

O.K., 2h.p., 2-speed, nominally shop-soiled; to clear at £30.—Meeten, Motors, Dorking. [6551]

## P. and M.

P. and M., 1912, 3½-4h.p., Bosch, 2 speeds, almost new; offers.—1, Ebner St., Wandsworth. [X1411]

1914 3½h.p. P. and M., 2-speed, wicker sidcar, in perfect condition; cash or easy terms; £45.—R. E. Jones (Garages), Ltd., Swansea. [0721]

P. and M., 3½h.p., 1913 model, kick start, 2 speeds, excellent condition, and will take a sidcar anywhere; £35.—Maudes Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6569]

P. and M., 1915, 3½h.p., perfect condition, only used week-ends, coachbuilt sidcar, Lucas lamps, speedometer, spares, etc.; owner joining forces; nearest offer £65 has it.—Parkstone, Coombe Rd., New Malden. [6336]

## Paragon.

PARAGON 2-stroke, 3h.p., Enfield 2-speed, kick starter and clutch, U.H. mag., Amoc carburettor, Druids; cost £40 last August, not done 900; £28.—Spittlehouse, 141, High St., Plumstead, S.E. [6266]

## Peco.

PECO, 2½h.p., 2-stroke, semi-T.T., 1915 (Sept.), P.H. lamps, reliable machine; £23.—Tomlinson, Grange Rd., King's Heath, Birmingham. [X1456]

## Peugeot.

PEUGEOT, 5h.p. twin, and sidcar, splendid running order; bargain, £19.—105, Ashmore Rd., Paddington, W. [6380]

4-h.p. Peugeot, mag., 2 speeds, countershaft, handle bars starting, all handle-bar-control, Druids, sidcar with child's seat, tyres and tubes excellent; £26; seen by appointment.—141, Gladesmore Rd., Stamford Hill. [6557]

## Precision.

1915 Precision, 2-stroke, 2-speed, fine order; £24; seen after 7.—20, Clavering Av., Barnes. [6302]

## Premier.

PREMIER, 3½h.p. twin combination; bargain, £30; called up.—Firs Villas, Horley, Surrey. [6437]

1914 7-gh.p. Premier, touring, sidcar, good tyres, new tubes; trial; £50.—135, Tylacyn Rd., Penygraig, Rhondda, S. Wales. [X1421]

3-h.p. Premier, F.E., and sidcar, Gradua gear, fine condition; owner joined; £27.—Leighton's, opposite Wood Green Station. [6259]

PREMIER, 1914, 3½h.p., 3-speed, torpedo wicker sidcar, excellent condition throughout; any test, £32.—Toms, Catherine St., Leicester. [X1065]

## MOTOR CYCLES FOR SALE.

## Premier.

**PREMIER**, 1914, 3½ h.p., 2-speed countershaft, only done 1,000 miles, quite as good as new; £42.—Boyce, 323, Archway Rd., Highgate. [6414]

**PREMIER** 1912 3½ h.p. Model, 2 speeds (countershaft), excellent order and condition; a bargain, £25.—Maudes' Motor Mart, 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6579]

**31 h.p. Premier**, 1912, engine perfect, Dunlop tyres 22 and 24, nearly new, Lucas head lamp, few spares; £16; owner back from front incapacitated; seen by appointment at Ilford any time.—Lt. Newland, 10th Middlesex Regt., Purfleet. [6541]

**PREMIER**, 1912, 3½ h.p., 3-speed, an unusually fine sample, almost as new, maintained extravagantly by late owner, good mechanically and almost new in all other details, complete; £26, great bargain.—Layton's Garage, Biester, Oxon. [X1460]

## Quadrant.

**4 h.p. 1912 Quadrant**, speedometer, Bosch, T.T. bars, smart machine; £14.—125, Canal Rd., Mile End E. [6384]

**QUADRANT**, 4½ h.p., 1913, 3-speed, Palmer cord, John Bull, Stewart; £28; apply after 7; trial.—27, Drews Lane, Ward End, Birmingham. [X1304]

## Radco.

**RADCO**, 2½ h.p., 2-stroke, new January, footboards, excellent order; £23.—Lane, Mount Pleasant, Crewekerne. [6516]

**RADCO**, 2-stroke, new condition, heavy studded tyres unpunctured; bargain, £18/18.—18, Bellevue Gardens, Clapham Rd., S.W. [6454]

## Rex.

**1912 6 h.p. Rex**, free engine model, good condition; £25.—Little, The Myrtles, Hawley, Dartford, Kent. [6269]

**£7/10**, or exchange push bike.—23½ h.p. Rex, m.o.v., B. and B.; can be hidden away.—Shore, Tredworth, Gloucester. (D) [X1270]

**5 h.p. Twin Rex**, Bosch, B. and B., Dynids, coach sidecar, Dunlops, new Avon heavy back; £18.—149, Denmark Hill. [6401]

**REX** 4 h.p. 1913 Clutch Model, excellent order, and complete with lamps and horn; £27.—Maudes' 136, Gt. Portland St., London, W. [6570]

**REX** 5 h.p. Twin Combination, 2-speed gear, free engine, good running order; £18/16/6, or exchange for solo.—Marchant, Yeadon, Leeds. [6335]

**1912 Rex**, 6 h.p., 2-speed, coachbuilt combination, very little used, perfect condition; £32, or exchange solo.—3, Trinity St., West Bromwich. [X1364]

**1912 Speed King** 6 h.p., 2-speed Rex, in very good order, new belt and tyres; £26; easy payments arranged.—Jones, Garage, Broadway, Muswell Hill. [6242]

**REX** 3½ h.p., 3-speed Model, all latest improvements, late 1909 model, an excellent solo mount, or would take a light sidecar; £15.—Maudes' Motor Mart, 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6578]

**1913 6 h.p. De Luxe Sidette Combination**, 650×65 Ron and Dunlop tyres, luxurious sidecar, combination in excellent condition and complete with lamp, horn, tail lamp, etc.; £35.—The Premier Motor Co., Aston Rd., Birmingham. [6488]

**REX**—1914 6 h.p. Rex de Luxe combination, 3 speeds, chain drive and kick start, all lamps, horn, etc., just been thoroughly overhauled and guaranteed, a great bargain at £50; another similar just being overhauled, 2 speeds, and handle start, 1914 model, £46; another 1913, with cane torpedo sidecar, 6 h.p., 2 speeds, and clutch, £28.—Maudes' Motor Mart, 100, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6573]

## Roc.

**4 h.p. Roc Motor Cycle**, m.i.o.v., Roc 2-speed, Amac carburettor, magneto sprockets (less magneto), splendid engine; £6/15.—37, Furzehill Rd., Plymouth. [X1439]

## Rover.

**IN STOCK**, Rovers, T.T., with Philipson pulley; £56.—Holme, Dalton-in-Furness. [X1359]

**ROVER**, clutch, Philipson's pulley, wicker sidecar; £28, sell separately; a bargain.—Box 505, *of The Motor Cycle*. [X1362]

**1916 Rover**, T.T., with Philipson pulley, done 300 miles; cost with accessories £62, first offer £56.—Holme, Dalton-in-Furness. [X1361]

**ROVERS**—Latest models in stock; T.T. racers, semi-sporting models, with Philipson, etc.—P. J. Evans, John Bright St., Birmingham. [X1356]

**ROVER**, 1914, 3½ h.p., 3 speeds, clutch and starter, usual accessories, semi-T.T. model; £36.—P. J. Evans, John Bright St., Birmingham. [X1359]

**ROVER**, 1916 models in stock; your present machine can be taken as part payment.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

**1914 3½ h.p. 3-speed Rover** and Coachbuilt Sidecar, in splendid condition; £47/10; easy payments arranged.—Jones, Garage, Broadway, Muswell Hill. [6243]

**ROVER**, 1914, 3½ h.p., 3-speed clutch model, small mileage, bought new December, 1914, excellent condition; accept £38.—Longman Bros., King St., Acton. Phone: 1578 Chiswick. [6422]

# REALLY IN STOCK.

3½ h.p. <b>PREMIER</b> , 3-speed, etc. ....	£66 0
2½ h.p. <b>EDMUND</b> , spg. frame, 2-sp., etc. ....	£46 4
<b>B.S.A.</b> , Model K .....	£62 0
<b>HARLEY-DAVIDSON</b> , 11F, brand new. ....	£68 5
4½ h.p. <b>JAMES</b> , 3-speed, and Sidecar ..	£80 10
3½ h.p. <b>T.T. ROVER</b> , Philipson pulley ..	£56 0
<b>T.T. IXION</b> .....	£28 10
<b>JAMES</b> , 2-speed .....	£38 10
Lady's <b>METRO</b> , 2-speed .....	£38 10
<b>HOBART</b> 2-speed .....	£38 10
<b>SPARKBROOK</b> , 2-speed .....	£40 0
<b>EXCELSIOR</b> , single-gear .....	£30 16
<b>OMEGA</b> , 2-speed, 3 h.p. ....	£39 18
<b>OMEGA</b> , single-gear .....	£31 10
<b>OMEGA</b> , 2½ h.p. J.A.P., 2-speed .....	£39 18
Lady's <b>IXION</b> , 2-speed .....	£38 0
1915 <b>IXION</b> , like new .....	£25 0

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1915 6 h.p. <b>A.J.S.</b> combination, fully equipped, cost £130, beautiful order	£105 0
1916 <b>ENFIELD</b> , 2-stroke .....	£38 0
1915 <b>SPARKBROOK</b> , 2-speed, 2-strokes	£35 0
1910 3½ h.p. 2-speed <b>HUMBER</b> .....	—
1910 3½ h.p. <b>SCOTT</b> , 2-speed .....	£22 0
1909 <b>TRIUMPH</b> , 3½ h.p., overhauled ..	£20 0
5 h.p. twin <b>PEUGEOT</b> , magneto, fine condition, low .....	£22 0
1914 2½ h.p. <b>A.J.S.</b> , kick starter, etc., beautiful order, complete .....	£42 0
1916 3½ h.p. <b>T.T. SUNBEAM</b> , only done 300 miles, complete .....	£72 0
1913 6 h.p. <b>REX De Luxe</b> , 2-speed, splendid goer .....	£20 0

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## MOTOR CYCLES FOR SALE.

## Rover.

**ROVER**, 1915, 3½ h.p., 3-speed countershaft model; an exceptionally desirable machine, used by careful and experienced owner; complete, £50; approval.—Luton's Garage, Biester, Oxon. [X1461]

**1914 3½ h.p. Rover**, footboards, 3-speed Sturmeys-Archer, lamp, horn, speedometer, knee grips, all tools, etc., condition guaranteed perfect; £40.—Robinson's Garage, Green St., Cambridge. [6496]

## Royal Ruby.

**ROYAL Ruby**, all 1916 models, 2 and 4-stroke, excellent stock; exchanges arranged; trade supplied. A few 1915 models to clear at exceptionally low prices.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6567]

## Rudge.

**1912 3½ h.p. Rudge**, free engine, good condition; £25.—R. E. Jones (Garages), Ltd., Swansea. [0785]

**RUDGE**, 3½ h.p., free engine, T.T. handle-bars, in perfect condition; £30.—109, Park Rd., Dulwich, S.E. [6388]

**RUDGE Multi**, 1913, 26 gns.; T.T. clutch Rudge, 1914, 24 gns.—Troward, 78, High St., [6473]

**1912 Rudge Coach Combination**, 3 speeds, clutch, all accessories, just overhauled; £55, for lightweight and cash.—Walton, Dawson Sq., Burnley. [X1269]

**RUDGE Motor Cycle** for sale, perfect condition, 1913, 3½ h.p., N.S.U. 2-speed gear; owner on active service; £30, or near offer.—Venn, Strathearn Mansions, Southsea. [X1243]

**RUDGE**—If you wish to purchase or sell a Rudge, communicate with us. Early delivery of latest model.—Longman Bros., King St., Acton. Phone: 1578 Chiswick. [6423]

**RUDGE**, late 1913, 3½ h.p., Brampton variable gear, cane torpedo sidecar, splendid order, complete with accessories, including speedometer; £35; seen any time.—W. Hurlock, Jun., Ltd., 63, Denmark Hill, London, S.E. [6594]

**RUDGE and Sidecar**, 1913, Sturmeys-Archer 3-speed, splendid condition, P.H. lamp set, Lucas back set and S.C. lamp, Cawsey speedometer, watch, Gloriphone horn, all new Dunlops, complete set tools, spare belt, valves, etc.; sacrifice £29; any trial.—Groves, 60, Malden Rd., N.W. [6310]

## Scott.

**COLMORE Depots**, Birmingham and Manchester, for Scott motor cycles. [0806]

**SCOTT**, 1914, condition as new; £40.—Crawford Garage, Alfreton Rd., Nottingham. [X1268]

**SCOTT**, perfect condition, engine just overhauled by makers, B.B. carburettor; £25.—Brambles, Mortimer. [X1384]

**SCOTT**, winner of 1912 T.T. race, engine perfect; no reasonable offer refused.—Crawford Garage, Alfreton Rd., Nottingham. [X1267]

**SCOTT**, 3½ h.p., 2-speed, kick starter, Binks, new Palmer cord, engine overhauled by Scotts.—Holt, 86, Glengall Rd., Peckham. [6340]

**SCOTT**, semi T.T., late 1915, perfect condition, speedometer, Lucas lamps, horn, done under 700 miles; accept £60.—Ralph Green, Haverfordwest. [6276]

**SCOTT and Canoelet Sidecar**, large head light, mechanical horn; any examination; owner on service; £33.—Mrs. Lidderdale, Weeping Cross, Stafford. [6512]

**SCOTT Combination**, 1914, 3½ h.p., 2-speed, Binks carburettor, Bosch mag., Stewart speedometer, whole in fine condition; price £35.—Write, Lieut. A., R.A.M.C. Redhill. Phone: 300 Redhill. [X1414]

**BEST Offer** over £50 secures Scott and fine coachbuilt sidecar, not used for one year till 3 weeks ago, overhauled, 1915 spring forks, new tyres, 1915 piston; trial by appointment.—8, Old Rd. West, Gravesend. [6604]

**SCOTT**, 1914, just re-bushed, Binks carburettor, Lucas accessories, Jones speedometer, also special aluminium sidecar, hood, screen, exceptional condition, absolutely reliable.—213, Rake Lane, Wallasey. [X1366]

**1913 Scott and Gloria Sidecar**, speedometer, full equipment, fine condition; any reasonable trial given; £33/10.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham. [5894]

## Singer.

**SINGER** 1914 Lightweight, speedy, good order; bargain, 20 gns.—Ward, 7, Victoria Parade, Muswell Hill, N. [6485]

**SINGER**, 1913, 3½ h.p., 3 speeds, clutch; bargain, £19/10, offers nearest; property of officer once abroad.—Hinds, Brightingsea, Essex. [6521]

## Sun.

**SUN-VILLIERS**, with lamp, tools, and horn; £20.—Reed, 41, Berners St., Ipswich. [X1216]

**SUN-VILLIERS**, 2½ h.p., new but shop-soiled; £27 to clear.—Walsh Motor Co., Ely, Cambs. [X1470]

**SUN**, 2-strokes; all models from stock from £29/10.—Colmore Depot, 261, Deansgate, Manchester. [6025]

**COLMORE Depots**, Birmingham and Manchester, for delivery from stock of all models of Sun motor cycles. [0807]

## MOTOR CYCLES FOR SALE.

## Sun.

1915 2½ h.p. Sun-V.T.S. used twice only, equal to new; cheap. £24.—Walbro Motor Co., Saffron Walden, Essex. Phone: 45. [X1435]

SUN-PRECISION. 1913, 3½ h.p., 3 speeds, clutch, new speedometer, all accessories, very little used, powerful sidecar machine; £35.—Platford Mill, Leigh, Lancs. [X1289]

SUN-VILLIERS. 1916, 2½ h.p., 2-stroke, 2 lamps, horn, speedometer, tools, accessories, perfect, done 600 miles, unpunctured; £28, cost £36; owner enlisted; seen any time.—91, Lennard Rd., Penge. [6535]

SUN-VILLIERS.—All 1916 2-stroke single and 2 speeds ex-actual stock, also Sun V.T.S. Call or write for list. Exchanges arranged.—Maudes' Motor Mart, 100 and 136, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6571]

## Sunbeam.

SUNBEAM, new 1916 3½ h.p. standard model actually in stock.—Moss, Wem. [X1329]

1916 3½ h.p. Sunbeam, with Skiff Mills-Fulford sidecar, usual black-gold finish, with 2 lamps, horn, etc., latest improvements; instant delivery; £87.—Robinson's Garage, Green St., Cambridge. [6495]

SUNBEAM, late 1915, 6 h.p., 3-speed, with Sunbeam sidecar, all complete, done no work owing to owner being on active service; trial and inspection by appointment with The Chauffeur, Rolleston Hall, Burton-on-Trent. [6203]

1915 6 h.p. Sunbeam and Gloria cane body sidecar, with luggage grid, etc., fitted with Lucas lamp, speedometer, and wind screen, tyres good, turnout in first-class condition; £80, or close offer.—Capt. Saxty, Holly Lodge, Bloomfield, Bath. [X1446]

6 h.p. Twin-cyl. Sunbeam, with No. 2 sidecar, spare wheel and tyres, Lucas dynamo lighting set, and all accessories, late 1915 model, only run 600 miles; cost £140; can be seen at Westminster by appointment.—No. 1, 531, c/o The Motor Cycle. [6391]

SUNBEAM, 1914½, 6 h.p., 3-speed countershaft, Gloria coachbuilt sidecar, speedometer, Lucas 3 gn. lamps, 2 nearly new heavy Clincher, spare tube, excellent condition, splendid engine, kick start; 70 gns.—Rev. Nixon, 7, St. Loo Mansions, Chelsea, London. [6427]

1915 Sunbeam, 3½ h.p., low built, specially constructed for the Isle of Man race, about 1,000 miles only, picked engine, 3-speed kick-start, very fast, semi-T.T. bars, 2 Lucas lamp sets, Cowey £4/4 speedometer, horn, 3 toolbags.—Robinson's Garage, Green St., Cambridge. [6494]

## T.D.C.

3½ h.p. T.D.C., cane sidecar, 4-point, chain-cum-belt, 32 S.A. countershaft, clutch, Bosch, Druids, Best, Lloyd, 650×65, new Sunstone, lamps; £36; exchange higher power, adjustment; separate.—23, Westland Rd., Wolverhampton. [X1404]

## Triumph.

TRIUMPH, 1908, good order; £13.—Grover, Bletchley. [X1255]

TRIUMPH, 1913, clutch model, in beautiful condition; £30.—Grover, Bletchley. [X1254]

1916 Triumph Junior, run 30 miles; 10% discount.—Lamb, Murray Place, Stirling. [X1297]

TRIUMPH 1912, 2-speed, free engine; £23, bargain.—29, St. Leonard's St., Bow. [6453]

TRIUMPH, 3½ h.p., £25; not rubbish; owner enlisting.—1, Rectory Lane, Tooting, S.W. [X1443]

1916 4½. Countershaft Triumph, new; immediate delivery.—M. Trethewey, Roche, Cornwall. [6370]

TRIUMPH, 1912, sidecar, 3-speed, splendid condition; £26.—Plough Garage, Clapham Common, London. [6273]

TRIUMPH, 1907, good running order, accessories; £11, offers.—68, Evelyn Av., Newhaven, Sussex. [6351]

1910 T.T. Triumph, in good condition; a bargain, £20.—Jones, Garage, Broadway, Muswell Hill. [6244]

TRIUMPH, 1910, handle-bar and foot controlled clutch; £21, best offer.—Black, Crown Hotel, Alloa. [X1222]

1912 3½ h.p. Triumph, clutch model, in perfect order, accessories; £27/10.—Railway Garage, Staines. [6553]

JUNIOR Triumph, 2½ h.p., 2-stroke, with accessories, perfect; £32, no offers.—Stephenson, 7, Orchard St., Tamworth. [X1479]

TRIUMPH, 1913, 3½ h.p., 3-speed, free engine, just overhauled; £37.—Ellston, Rye Hill, Haslingden, Lancashire. [X1306]

TRIUMPH, 1909, clutch, sidecar, new tyres, re-bushed, good order; bargain, £25.—20, Bowen Rd., West, Harrow. [6533]

3½ h.p. Triumph Motor Cycle, overhauled by makers, 32 new tyres; £21, or best offer.—C/o Withnall's Garage, Reading. [6271]

TRIUMPH, 1910, T.T., good condition, new tyres; exchange good push bike, cash.—Lamb, Aerodrome, Milton, Pembroke. [6294]

TRIUMPH, 1910, with Brampton variable gear, and torpedo wicker sidecar; cheap, £21.—Toms, Catherine St., Leicester. [X1064]

TRIUMPH, 1910 and 1909, both good condition, re-bushed; £17 and £15; ride 30 miles.—Stuart, Hatfield Heath, Essex. [6526]



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947. 2½	O.K.-PRECISION, 1912, in nice condition	£16 0
54. 2½	ALLDAYS - VILLIERS, 2-stroke, good condition	£19 0
	£20 and £30.	
11. 2½	TORPEDO, 2-stroke, 1915 model, very nice order	£20 0
35. 2½	CLYNO, 2-stroke, 2-speed, with hand-controlled clutch	£25 0
119. 3½	B.S.A., 1912, 2-speed and free engine, nice 1st gear or solo mount	£28 0
123. 3½	TRIUMPH, 1909, N.S.U. gear, coach-built Sidecar	£29 10
124. 2	CALTHORPE Junior, 2-sp., nice condition	£15 0
107. 2½	DOUGLAS, 1911, 2-speed	£21 0
116. 2½	CLYNO, 2-stroke, 2-speed, fine machine	£28 0
264. 2½	A.J.S., 2-speed	£27 10
133. 3½	RUDGE, 1911-12, N.S.U. gear, F.R.S. lamp set, good condition	£22 10
	£30 and £40.	
41. 7	INDIAN, 1912, 2-speed, clutch, coach-built Sidecar, screen, etc.	£37 10
59. 3½	P. & M., 1911, and Sidecar, 2-sp. and clutch	£30 0
117. 6	BAT-J.A.P., 1913, 2-speed gear, clutch and kick starter, chain drive, side-entrance Sidecar	£37 10
111. 3	ENFIELD, twin, 1915, very good order	£38 0
278c. 3½	TRIUMPH, 1913, 3-speed, F.R.S. lamp set, Lucas horn, watch	£32 0
	Over £40.	
679. 6	CLYNO, 1914, chain drive, No. 6 Sidecar, hood, screen, lamps, etc.	£65 0
41	JAMES (late 1914) Combination, 3-speed countershaft gear, chain drive, extra silencer under sidecar, lamps and horn	£52 10
67. 4	TRIUMPH, 1914, with 2-speed countershaft gear, clutch, and kick starter	£45 0

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(LONDON)

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Telephone : Holborn, 6430.

Telegrams : "Admittedly."

## MOTOR CYCLES FOR SALE.

## Triumph.

TRIUMPH, 1913, free engine, 2 speeds, just overhauled, good condition; £28.—Master, 10, Willes Terrace, Leamington. [X1265]

TRIUMPH, late 1912, 3-speed, perfect condition, tyres unpunctured, also light sidecar; £37/10.—2, Kingsholme Sq., Gloucester. [X1375]

1913 Triumph, 3½ h.p., 3-speeds, with 17 gn. Gloria sidecar, as new, lamps, etc.; £45.—R. E. Jones (Garages), Ltd., Swansea. [10786]

TRIUMPH, 1910, Lucas lamp, horn, tools, excellent condition; £19; owner on active service.—24, Queen's Rd., Twickenham. [6275]

1911 Triumph, 3½ h.p., clutch, 2 speeds, speedometer, horn, lamps, etc., splendid condition; £25.—185, Katherine St., Ashton-under-Lyne. [6433]

TRIUMPH Junior, an exceedingly fine sample, overhauled and guaranteed sound, Lucas lamp, etc.; £32/10.—Layton's Garage, Bicester, Oxon. [X1463]

TRIUMPH, 3½ h.p., 1909½, engine 1914, 3-speed, Bates tyres, lamps, accessories, 17 gn. sidecar, perfect order; £32/10.—36, Goodall St., Derby. [6342]

FOR Sale, 2-speed 1912 Triumph, lamp, horn, speedometer, new Clincher back, new cylinder, engine perfect; £22.—Rabson, 26, Ferrers Rd., Streatham. [6501]

1913 3½ h.p. 3-speed Triumph, with Canoelet coachbuilt sidecar; £40, cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea, London, Cardiff. [10734]

1913 3½ h.p. 3-speed Triumph, with Leicester cane sidecar, engine recently overhauled by makers; £40.—Reed, Beverley, St. James' Rd., Hereford. [X1298]

TRIUMPH Junior, 1915, brand new Clincher rear, almost new front, spare inner tube and belt, full accessories; £31.—Lieut. Pearse, St. George's, Chichester. [X1380]

TRIUMPH, 1914½, 4 h.p., 3 speeds, Montgomery coachbuilt sidecar, been carefully used, and in perfect order; 50 gns.—Alfred Gray, Woodcroft, Whitby. [X1320]

TRIUMPH Junior, 2-speed, condition excellent, lamps, generator, mirror, speedometer, horn; £33; purchased 1915.—Stannab, Skin Market Place, Banskade, S.E. [6517]

TRIUMPHS.—Two 1912 clutch models at £26 and £27/10 respectively; also a 2-speed Baby Triumph, £32/10.—Newham, 223, Hammersmith Rd., W. [6537]

GENUINE Tourist Trophy Triumph, new 1915, faultless, Lucas accessories; any trial willingly; £37, or swap sporting twin.—W. S. Life, 111, Lea Rd., Wolverhampton. [X1295]

1914 T.T. Triumph, fast machine, almost new condition, complete equipment; £37/10. Combination wanted.—Newham, 223, Hammersmith Rd., W. Phone: 80. [6538]

1910 Triumph, clutch, 3½ h.p. model, excellent tyres, spare belt, in perfect order; owner at the Front; best offer and thorough test by appointment.—60, Lowlands Rd., Harrow. [X0561]

1914 Triumph, 4 h.p., 3 speeds, 2 new belts, 2 new spare tubes, speedometer, lamps, horn, mileage 2,300 miles, excellent condition; 40 gns.—Bedford, New Ground Farm, Tring. [X1567]

1911-1912 3½ h.p. Triumph, free engine, Kempshalls, lamp, and accessories, excellent condition; owner O.H.M.S.; £22/10; appointment.—Holloway, 18, Upper Brockley Rd., Brockley, S.E. [6500]

TRIUMPH, 1913, 3½ h.p., 3-speed, issued new 1914, latest type gear, guaranteed sound, condition is most desirable; £36, with lamps and horn, indisputable bargain.—Layton's Garage, Bicester, Oxon. [X1430]

LATE 1912 Triumph, clutch model, new belt and tyres, in splendid condition, just been overhauled by makers; owner enlisted; nearest offer to £28.—Apply, Simmons, 110, Greencroft Gardens, West Hampstead, N.W. [6305]

TRIUMPH, 1912, T.T.; with 1914 improvements, Philipson pulley, new belt, unpunctured tyres, 1 spare, all-black frame and wheels, Lucas lamps, horn, just overhauled; price £32.—Graham, 21, Fairfield Rd., Chesterfield. [6448]

TRIUMPH, 1914, 4 h.p., 3-speed model, complete with coachbuilt sidecar, all lamps, horn, and speedometer, ready to ride away, fully overhauled and guaranteed a bargain; £48, complete.—Maudes' Motor Mart, 100, Gt. Portland St., London, W. Tel.: 552 Mayfair. [6577]

TRIUMPH Junior, 1915 model, bought in September, only done about 500 miles, complete with all accessories, electric head and tail lamps, oil in excellent condition; £40, or nearest offer, machine perfect throughout.—Apply, Hickman, Amesbury, Woodbridge Hill, Guildford. [6344]

1914 Triumph, fine solo machine, with 3-speed and clutch, comfortable riding position, semi-T.T. bars, double pair footrests, complete with guinea horn, head and rear lamps, usual tools, etc.; price £43/10; exchange for recent lightweight.—Newham, 223, Hammersmith Rd., W. Phone: 80. [6536]

## Velocette.

VELOCETTE, 1914½, 2 speeds, 600 miles, £23; also half-plate camera, complete Aldis f/7; exchanges.—22, Adelaide St., Platt Bridge, Wigan. [X1415]

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

## Advertising and Publishing Offices:

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## Editorial Offices:

Hertford Street, Coventry.

Telegrams: "Motorcycle, Coventry."  
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## Northern Offices:

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Subscription Rates: Home, 6s. 6d.; all countries abroad, 10s. 10d. per annum.

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## Where the Petrol goes!

**W**E are pleased to note that the leading daily papers are beginning to realise a fact which we have been pointing out, almost *ad nauseam*, for many weeks, namely, that the motor cyclist who uses his machine for necessary journeys is not the unpatriotic sinner which he has been represented to be, nor is he responsible for the shortage of petrol, if this exists. There may be some difference of opinion as to what constitutes a *necessary* journey. Naturally all professional trips must come under this heading, so also must a man's daily journey from his home to his place of business. In some cases, of course, this last may be made by train, but often the trains are very inconvenient as well as crowded, and it seems to us that a man who helps to relieve the morning and evening congestion on the railways is a benefactor rather than otherwise.

It may be urged that pedal cycles should replace motor cycles as the vehicles on which those who live in the country should reach their places of business, and it must be granted that in the matter of economy they excel where their use is practicable. It is, however, not every middle-aged man who can add the necessary effort to the toils of the day; moreover, in bad weather the pedal bicycle is the worst vehicle in existence, for it is impossible to wrap up adequately against the elements, and, at the same time, not suffer from excessive perspiration, and a wet arrival at the office is bound to have undesirable results.

Apparently the Petrol Committee has not recognised the economy of the motor cycle for the work we have just mentioned, for while taxicabs are placed in Class II., motor cycles are in Class III. in the matter of petrol supplies. Now a man who rides to business on his motor cycle and spends 6d. in fuel would, if he hired a taxicab for the purpose, use about 4s. worth of petrol, for the cab would have the double journey morning and evening; he would also be

employing a man who might be much more usefully employed on some productive work, and the cost would be from 15s. to 20s. per day.

There has recently been some sort of an enquiry made with reference to the charrs-à-bancs which run on purely pleasure trips at many of our health resorts, both by the sea and inland, and it has been found that thousands of gallons of petrol are being used in this way, for the consumption of these road destroying vehicles is something like five to eight miles per gallon, whereas many a motor cycle can do upwards of 100 miles on the same quantity, which means, even at the present exorbitant price, three miles and upwards for one penny. Need we say more?

## Twin-cylinder Two-strokes.

**C**OMPARATIVELY slow progress is being made with twin-cylinder two-stroke engines for motor cycles, mainly due to the war. This type of engine, however, is considered by many leaders of the motor cycle movement bound to loom large in the public purview in years to come. The specimens we now see are the forerunners of a really promising type of engine, for with the complication not exceeding that of a four-stroke single-cylinder, we have prime movers equalling in firing torque four-cylinder four-stroke engines as commonly fitted to cars. Granted they are not yet perfect, for extravagance of fuel consumption and lack of flexibility are outstanding troubles of the past, but these defects will be mastered in time, and the promise is then great.

As we have previously pointed out, the necessity of a spring frame is to some slight extent counterbalanced by fitting a smooth-running, even-firing, vibrationless engine. Were all motor cycles fitted with perfectly-balanced engines *The Motor Cycle* spring frame campaign might never have been launched, but the need for increased comfort is now only too palpable to those who have need to use the badly cut up road surfaces of the present day.



## MORE SPORTING



## REMINISCENCES

FOR real "sport" there was, of course, nothing to be compared with the chequered travels of the early pioneers. My own memories go back to the earliest days, but are mostly associated with cars, as I was very young and very impecunious when motors first came in, and the early motor cycles and tricycles did not permit the bloated plutocrat to offer pillion rides to poor and jealous friends. On the sole occasion when I took a pillion ride on a prehistoric motor cycle, I stood on the back axle of a De Dion tricycle with my arms round a friend's neck for about ten yards—when we emerged from his level drive to attempt a steepish hill, the whole contraption tipped over backwards and shed us in the road. It was on the same hill a year or two later—if the editor will permit a digression into four-wheelers—that we left a Locomobile spider car standing after a trial trip. I am not quite sure how the braking machinery of the creature was arranged, but anyhow reliance was placed on a single chain which joined the engine to the back axle. While we were at lunch the American chain dissolved into its component parts, and the Locomobile sped gaily backwards down the hill and considerably damaged some very handsome iron gates lower down.

## An Exciting First Ride.

I fancy my first ride on a motor bicycle was on a front-driven Werner in the Euston Road. The surface was greasy, and the ill-balanced machine threw me off, jumped on top of me, pummelled me soundly, and ended by catching fire, as inevitably happened when you got a sideslip with tube ignition. And sideslips took some resisting with front-driven machines, and heavy engines perilously poised on the top of the back wheel. I wonder if the Werner Brothers are still alive? They sold me several machines later on; one had a dustproof carburetter, ingeniously concealed inside the tank, entry being gained by a sliding panel with sharp edges. The vaporiser was dustproof enough, but it gave trouble from other causes, and the sharp edges of its dust-proof chamber scarified my fingers and wrists till they looked as if they had been trapped in a mowing machine. I believe the same people sold me quite a modern looking 2 h.p. with flat belt drive.

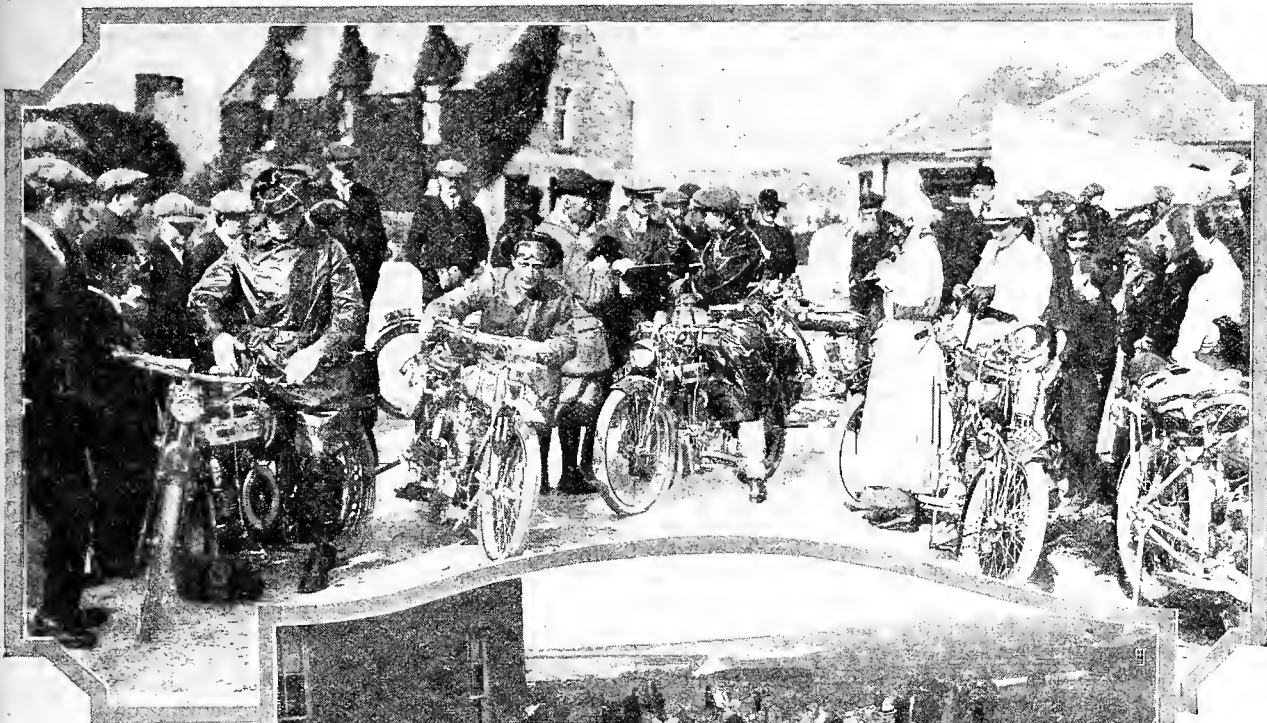
A well-known lady competition rider, Mrs. Baxter, crossing a small water-splash. She is the wife of Lieut. Baxter who after a plucky bombing attack was reported missing, as stated in our issue of May 18th.

*The reminiscences of trials and doings of the past recalled by a veteran competition rider in our Spring Number of April 13th were so appreciated that we asked our contributor to continue the series. This he has done, and the second instalment, dealing more with his earliest motor cycle experiences than with actual trials, is published herewith. "Some Manx Memories," by the same writer, will appear in an early issue.*

The engine pulley was made of paper or leather washers threaded on studs, and you renewed the washers every fifty miles, though it was really the belt that needed renewing.

My first really good drive on a motor cycle was in the rear saddle of a very quaint affair. Its front end consisted of an Ariel tricycle—a genuine improvement on the De Dion, as the engine was inside the rear axle, and so far improved the balance that the front wheel did not tip heavenwards and scout for hostile aircraft unless you ran over an unusually big brick. The rear half of the combination took the form of the back part of a lady's tricycle, bolted to the Ariel axle, and known as a Whippet trailer. The owner sat in front and drove, and I was thus saved all responsibility. All went well till the sparking plug wire came off. It took us an hour to solve the puzzle. Though we found and replaced the plug terminal in five minutes, it did not occur to us that the wire ought to go under the terminal. On the way home we got ditched, for the following amazing reason. My friend imagined that you stopped the engine by applying the brakes, being ignorant of the concealed switch inside the left handle-bar grip. After a few miles the brakes became too weak to stop the engine any longer, and we met our Waterloo through taking a quick bend too fast.

The first decent motor bicycle I remember was a 1½ h.p. Phoenix ridden by J. van Hooydonk. I know now that it smelt and rattled abominably, and was a poor hill-climber; but in these days imagination could picture nothing more splendid. Hooydonk was a long way behind his orders, and I rode several French machines instead, until I got on to the 1½ h.p. Excelsior-Minerva, with a baby engine strapped with tinfoil under the front down tube (no relation of the modern Excelsior). A clever traveller had almost screwed me up to ordering a 2 h.p. Quadrant (I don't know that the engine was really more powerful than the 1½ h.p. Minerva, but it sounded better, and we were all eager for more power), when the first 2¾ h.p. M.M.C. Excelsior with an enlarged edition of the famous De Dion engines appeared. I ordered one with a forecarriage, which inspired my *début* in motor journalism. Very few people then possessed forecars, and I wrote and offered a brilliant description of my



BYGONE  
SPORTING  
SCENES.



(Top) At Thurso in the 1913 Scottish "Six Days."

(Centre) Finish of the 1910 End-to-end trial at John-o'-Groat's.

(Below) A. Scott (3½ h.p. Scott) winning his class in the 1908 A.C.U. Sutton Bank climb.



Climbing Butter Tubs Pass in the 1913 A.C.U. "Six Days."



**More Sporting Reminiscences.—**

experiences to the Editor of *The Motor Cycle*, and also to the editor of a rival publication, which ceased to appear shortly afterwards. Both accepted eagerly without seeing the MSS., and I hastily took some alternative photographs, and recooked an auxiliary version of the copy. The main point about that forecar was that you took out the front wheel of the bicycle and fastened the forecar to the front down tube of the former with a single clip. Needless to say, my forecar turned round at right angles and bowed to me when I was going fast downhill. My mechanical genius was early apparent; I extended the clip till it also encircled the saddle-pillar tube; and until the clip broke both tubes I had quite a good time with the outfit, and actually drove it round Devon and Cornwall.

My next interesting purchase was a Dennis Speed King quad. Why "Speed King" I don't quite know, unless the makers had a good sales manager. The machine could not coast down River Hill at more than 25 m.p.h. owing to the awful friction in its French epicyclic gear, and if the wind were against it, it was hard pressed to average 10 m.p.h. on the level. I had long admired the machine as set out in the Dennis catalogue, but £125, its list price, was far beyond my means. However, I found one second-hand in the Euston Road on a wet Saturday evening, marked £60. I had £45, three months' wages, in my pocket, and an hour later I emerged from the emporium at the helm of the Dennis. It served me well on the whole, its chief failing being a habit of shedding a vital part of the two-speed gear. When

this happened, you remained in ignorance till you came to a hill and tried to change down; then you walked back, and offered huge rewards to everybody you met for the missing part. It had really three speeds up hill: one, low gear in, with both passengers aboard, say 6 m.p.h. and range very limited; two, low gear in, front passenger walking behind pushing; three, low gear in, both passengers pushing.

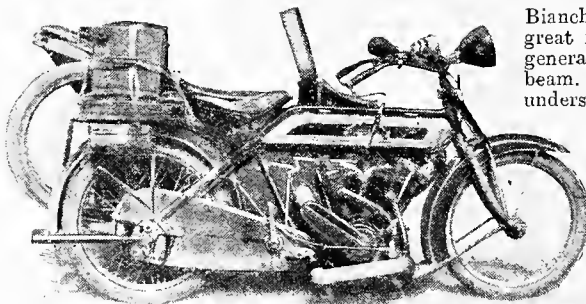
**Sad to Relate.**

Soon after this quad left me (I forget what happened to it), I blush to say I became something of a shamateur, until I saw the error of my ways. I bought my machines for cash, and criticised them freely in the public press; but I often figured in competition on special machines readied by the trade. For example, my manager informed me one Friday that he had entered me in three classes at a certain hill-climb. Would I please ride my own machine to the venue, when I should find something very hot in charge of his foreman? I duly arrived at the venue, to find an excited throng of officials and competitors hustling each other and arguing. Pushing my way into the heart of the scrimmage, I found the local inspector arguing with my manager's foreman, who was standing guard over a row of three racing machines, each bearing the same registration number, and that the number which adorned my own bicycle. The foreman appeared to be getting the worst of it, and I was careful to secrete myself and the very incriminating fourth machine until the sky had cleared. I regret to add that I was not placed in any of my three classes.

VETERAN.

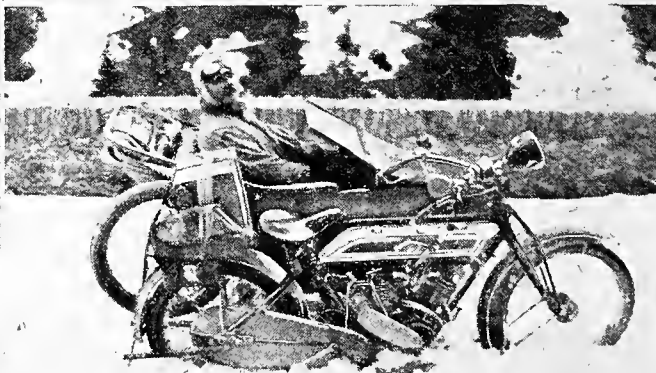
**A NEW ITALIAN SIDECAR.**

IN illustrating Italian-built motor cycles from time to time we have commented upon the obvious growing influence of British design upon the productions of Italy. Further proof of this point is to hand in the accompanying illustrations of a new 8 h.p.



Bianchi. One glance will show its great resemblance to British design in general, and in particular to the Sunbeam. This 8 h.p. Bianchi is, we understand, an experimental model, and the photographs were taken during a recent test on the St. Bernard Pass.

The engine is an 8 h.p. M.A.G. Other features are all-chain drive, three-speed countershaft gear, and hand-controlled disc pattern clutch.



# Occasional Comments by "Ixion"



## Carriers on Rear Sprung Frames.

The manufacturer who changes his specification usually finds himself confronted with more than he expected, and this common fate has obviously befallen one or two who are experimenting with spring frames. For example, technical motives may lead you to pivot your rear springs on a point situated somewhere down the saddle-pillar tube. In that case, you will probably find it convenient to hitch your carrier tubing to the same pillar. High carrier clearance may then be forced upon you; and when the entire frame design has been plotted out, you may find you have to hoist your saddle several inches in order that it shall clear the raised carrier. At this point you start to redesign the rear frame, and curse *The Motor Cycle* for denouncing rigid rear frames.

## Enthusiasts on the Rampage.

I have lately received two letters, one from an F.N. owner in New Zealand, the other from a British Scott devotee, and both were simply sizzling with appreciation. The Colonial brought out a point of some interest to designers. Belt drive he regards as useless in countries where water-splashes abound, and where creeks and floods are not uncommon. Chain drive is equally handicapped where the dust is deep, gritty and abrasive; if naked, it needs new sprockets sooner than we need new chains in England; if encased, the cases are useless after a few tumbles—and tumbles are the daily lot of the bush-track rider. But if he chose his F.N. because of its encased shaft drive, he appears to love it on every score. A further point of interest in his letter is that it keeps cooler than twins and singles do in the same climate; obviously, a four-cylinder has a greater radiating fin area in proportion to its cubic capacity than the ones and twos possess. This should be weighed by designers of Overseas models, especially those intended for the tropics. My Scott correspondent bases his enthusiasm for two-strokes on the absence of valve chatter, evidently possessing an ear which can stand the burble of exhaust gas, but is offended by any mechanical noise whatsoever. Also he prefers the Scott to all other two-strokes, because it is vibrationless at high road speeds, whereas the baby usually gets into something of a tantrum when asked to exceed 30 m.p.h.

## From Salonika.

The same post brought me an interesting dissertation from an officer at Salonika on the respective merits of the "square" and long-stroke engines. He has evidently been digesting Capt. Lindsay's opinion of the long-stroke Norton, and wonders why so many makers use a stroke which is only fractionally longer than the bore. I fear I have never heard a qualified engineer discourse on this topic, but I have always imagined that the long-stroke engine was hardly a machine for duffers, because its elongated connecting rod administers a fearful thump to the bushes when the engine is badly handled, and allowed to konk

round a corner, or whilst pounding a bad gradient after an awkward start. The long-stroke single creates a delicious sensation of getting down to its work, when it is properly handled; but if a fool manhandles it, its bushes are comparatively short-lived. I dare say most motor cycle manufacturers would agree with Carlyle as to the proportion of fools in the population; and hence their adherence to the "square" engine is not surprising.

## Fast Stretches.

Correspondents of *The Autocar* have been reminiscent on the subject of the fastest stretches of public road in the country, and amongst others the following lengths have been cited: (1) Great North Road, Boroughbridge and Catterick; (2) Hartford Bridge Flats on the London-Basingstoke road, now rather pot-holed; (3) Bath Road, Reading to Newbury; (4) Banbury-Oxford road, Deddington to Kidlington; (5) a stretch between Bath and Stroud; (6) part of the Witney-Cheltenham road; (7) Aylesbury to Banbury.

Some years have elapsed since I scrapped any part of the End-to-end route, but averages of over 30 m.p.h. for over thirty consecutive hours are not practicable without the aid of natural speed stretches, and I particularly remember a patch somewhere between Lancaster and Carlisle; another near Tarporley; and a third a few miles north of Truro, where some three miles about midway between Bodmin and Truro always struck me as a magnificent place for a flying sprint of two or three miles. Some of these stretches are only familiar to me in the small hours, when one is apt to gamble on nothing emerging from side turnings; riders who know them at all hours may state that it is unsafe to scrap them as a rule. Any other claimants? When all is said and done, the bit of road on which speed is pleasantest is the Carter Fell route into Scotland from Corbridge north. That part of Watling Street makes a beeline for miles, straight over all obstacles, and if its switchback character does not make for record times, the steep dips and rises make pace more exhilarating than it can ever be on the dead level. Here a car should not be used, as the next dip is usually blind, and one cannot always tell whether a second car may not be rushing up to meet you in a narrow road; but it is perfectly safe for speed motor cycling, and when the surfaces happen to be good, forms a most joyous little trip on a fast machine. I once got 60 m.p.h. out of a Ford somewhere near Crieff, in Scotland—by speedometer, *bien entendu*, on a particularly open bit of broad and slightly falling road; and even the Ford people would not want to censor my reference if I add that there wasn't much of that Ford left when we got back to town. It only hit the ground about once every ten yards, and really proceeded in a series of sighting hops, like a nervous kangaroo. If the Scots send in any fast stretches, I fancy there are one or two up Caithness way which are not exactly slow.



## THE SOURCE OF THE THAMES.

A Week-end Trip to Cheltenham.

WE have spent an exceedingly pleasant week-end on a 3½ h.p. P. and M. sidecar of the type supplied to the Royal Flying Corps. Our destination was Cheltenham, from which place we made small excursions. Cheltenham is a point which is exceedingly well situated as a touring centre, lying as it does on the edge of the Cotswolds, close to the range of which Birdlip Hill forms a part. It is also within easy distance of the Wye Valley and the Stratford-on-Avon district.

One of the most interesting spots near the town is Seven Springs. It lies just off the road from Cheltenham to Cirencester, which road, by the way, runs direct to the top of Birdlip. Father Thames, the most important river in the British Isles, both from an historical point of view and also from the fact that it carries more traffic than any other in the United Kingdom, if not in the world, first sees daylight in a very unpretentious manner. Any one passing along the road in a car or on a motor cycle is likely to miss the Seven Springs altogether unless he notices the name inscribed upon a signpost at the road



(Left) The tablet on the wall on which there is the Latin inscription marking the birthplace of our national river.

(Below) A corner of Seven Springs where Father Thames first saw the light.

junction. There is little or nothing to indicate its presence, merely a hollow at the roadside, rather charmingly situated among the trees, but somewhat muddy to approach. At the bottom of the hollow is a pool of clear water into which the Seven Springs issue. The pool drains underneath a wall into a charming lake one can just see through a barred window, and over this window is an inscription in Latin verse: "*Hic tuus O Tamesine pater septemgeminus fons*" ("Here, O Father Thames, is thy sevenfold spring").

In its early course the Thames goes by the name of the River Churn, or Isis, which latter name, as well as Thames, is preserved at Oxford, but after flowing through the University town it is generally given the name by which it is better known.

During our brief stay at Cheltenham the P. and M. acquitted itself exceedingly well, and climbed all the gradients to which it was put in the locality with remarkable ease. The engine, we noticed, was well balanced, and certainly

the whole machine lived up to its reputation of extreme reliability.

## Imports and Exports Both Increase.

IT is rather astounding at first to find upon turning to the Board of Trade returns for May that the number of motor cycles imported during that month is slightly more than that of the previous month. This surprise, of course, is due to the prohibition of imported motor cycles for pleasure purposes, which was made law some time ago. But machines for which deposits were paid on or before March 27th can be imported, and undoubtedly the greater part of the 361 received during last month come into this category. A few are probably sidecarriers, and there is no ban on such vehicles.

It is gratifying to see exports on the increase, and if only the difficulties, to which we have on more than one occasion referred, be removed, they would increase still further. Still, the value of the export is over £26,000 more than it was in April.

The following are the actual figures:

### IMPORTS.

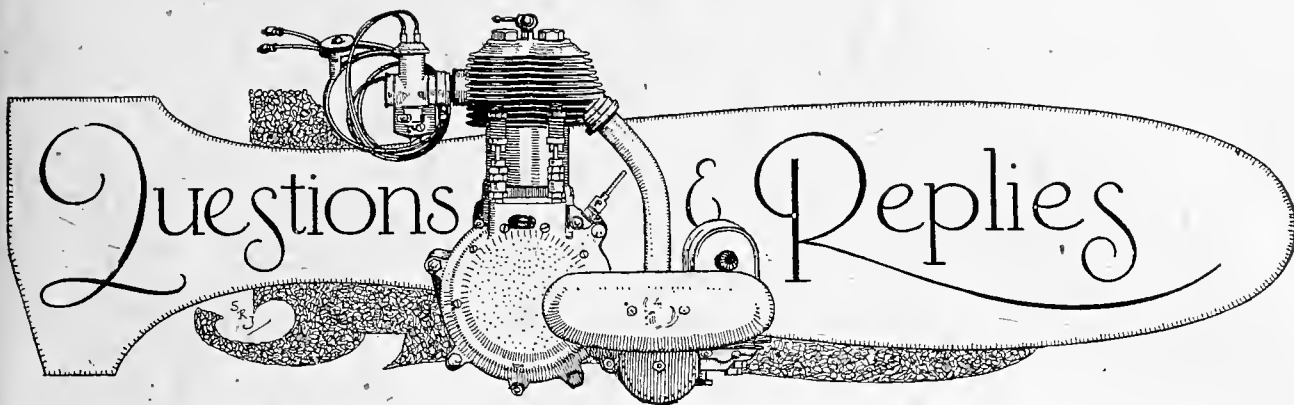
	May, '16.	April, '16.	May, '15.
Number ... ..	361	349	1,496
Value, complete machines ...	£15,511	£14,279	£16,982
„ tyres and parts ...	£9,532	£17,810	£17,218

### BRITISH EXPORTS.

	May, '16.	April, '16.	May, '15.
Number ... ..	895	626	858
Value, complete machines ...	£41,437	£29,487	£36,667
„ tyres and parts ...	£38,429	£24,105	£28,554

### Imports of Petrol.

10,348,789 gallons of petrol were imported into this country during May. The amount in April was 8,190,910 gallons. It should be noted that duty has been paid on 11,069,959 gallons for May, the assumption being that the difference in the two amounts has been taken out of bond.



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Advanced Ignition.

**Q.** I ride a 6 h.p. twin, and have been advised to keep the ignition lever control fully advanced whenever possible, retarding on hills when knocking occurs. I find this answers very well, but is it correct, or does it race the engine? Also, does riding with the spark advanced tend to make the engine run hot or otherwise?—W.F.H.

The method of driving, as regards the ignition lever, is perfectly correct. The farther you can advance the spark, within limits, the more likely are you to keep the engine cool.

### Lighting Dynamos.

**Q.** I lately bought in Auckland a Royal Enfield combination fitted with Lucas dynamo, etc. Within a month the cells have swollen one-third more than the proper size. I think the trouble is that as there is no governor on the six volt dynamo, the cells are being charged more often with an eight volt current. My reason for thinking this, apart from testing with a meter, is that I get twice the light with the engine running that I do when lighting from the accumulator only.—D.F., Te Aroha, New Zealand.

We submitted this question to Messrs. Lucas, who reply as follows: "We duly received your favour, with enclosure from 'D.F.' complaining that the cells of the lighting set fitted to his Royal Enfield combination have swollen considerably. This is certainly abnormal, and is the first case of this kind brought to our notice. If you will suggest to 'D.F.' that he communicate with us direct, giving instructions for despatch, etc., we shall be pleased to replace the battery free of charge. The following hints may be useful to your correspondent: As regards the lamps burning more brightly when the dynamo is on, this effect is produced when there is a bad or broken connection in the main dynamo battery circuit, causing the dynamo to be direct on to the lamps. For the bad connection, inspect the sidecar plug, and make sure that all the contacts are good, and if the plug is a loose fit in the hole, open out the plug at the slot with a knife. Also inspect

battery terminals, and make sure of good contact. Another cause of the trouble is bad contact at the control brush on the commutator of dynamo, or at the terminal connections of control brush. The 'governor' which the owner speaks of is in this machine an electrical device, and involves a third brush placed about midway between the two main brushes. It is essential that this brush should be making good contact on the commutator, otherwise the output of the dynamo will increase in relation to the speed, and overcharging will ensue, also increase in voltage at the lamp terminals when the dynamo is running at high speed. To prove whether either of the above faults is causing the trouble, carry out the following test: Remove all lamp plugs, switch into lamp position on the switchbox, and run the engine at high speed. The fuse inside the switchbox should then 'blow out.' It is easy then to find the bad contact whether in the control brush or in main dynamo battery circuit if the test proves its presence. If bad contact is discovered, rectify; and try fuse test again to make sure. One of the most important instructions is that which emphasises the necessity of seeing that all contacts, whether at battery terminals, sidecar plugs, dynamo brushes, or switchbox are tight."

### Difficult Starting.

**Q.** Would you be kind enough to help me out of a little difficulty? I have a 3½ h.p. fixed engine motor cycle, and I have a terrible job to get the engine going, having to run the machine up and down the road for a quarter of an hour or twenty minutes sometimes before I can get it to fire. The magneto is in first-class condition, also the sparking plug. I have had the carburettor down and cleaned it, and cannot find anything wrong with it. I have tried the air and throttle levers in different positions, but it does not make any difference.—H.G.H.

The trouble is almost sure to be due to air leaks at the induction pipe or carburettor unions; possibly, also, to a worn air slide. For starting you want a small quantity of mixture but a fairly strong one. Perhaps you have been trying to economise with petrol too much, and have too small a jet.

### Gear Ratio and Consumption.

**Q.** I am considering the purchase of a new 3½ h.p. motor cycle and sidecar, and, having used motor cars, I find this difficulty occurs in this lighter vehicle. Over bad roads the machine will not travel slowly enough on its top gear. Under no circumstances do I wish to travel over 25 m.p.h. Would it be wise to have the gear reduced? Would lowering the gear increase the petrol consumption? The top gear at present is 5.25 to 1.—L.R.

You might have the gear reduced slightly, especially if you do not wish to exceed 25 m.p.h. With the existing gear the machine ought to travel slowly enough. The trouble is probably due to the fact that the carburettor is not adjusted for slow running. Lowering the gear would raise the consumption to a small extent.

### Back Cylinder Refuses to Fire.

**Q.** I shall be grateful if you will help me to solve the following difficulty with the magneto on my 3½ h.p. Douglas. On a few occasions the back cylinder refused to fire when I attempted to start my machine from cold. In every case I took out and cleaned the plug, and sometimes injected some petrol to make sure that the cylinder was getting a proper charge. There was sparking at the plug. After I ran a couple of hundred yards the back cylinder suddenly fired and then the machine went without further trouble. Recently I found the same old trouble. When I was running on one (front) cylinder I touched the compression tap and the tappet, and at just that moment I felt a nasty shock; the right hand was on the handle-bar. Do you think the fault is due to the carbon holder? The trouble seems to occur only when the engine is cold.—T.S.

As the trouble only occurs when the engine is cold, it is quite possible it might be due to carburation and not to the ignition at all. An air leak, a sticking valve, or any defect of that kind would account for the symptoms of which you complain. You might look at the carbon brush, and if it is at all glazed, just rub the glazing off with a very fine file, or with a little fine emery paper.

**Irregular Running.**

**Q** I have a 1911 Douglas. A week ago the engine played all sorts of tricks—kicking, stopping, and then racing. My brother and I took it to pieces, and we found everything all right. Now, after re-assembling it, we find that it will not pull so well as a 1910 Douglas, which takes two up. I have come to the conclusion that the timing is the trouble. Can you tell me how to time it? At present the exhaust valves close at the top dead centre, and the engine fires just before the top of the stroke, with the spark lever advanced one-third.—H.E.H.

So far as we can make out the timing is perfectly correct. It is quite possible that the trouble may be due to the carburetter; either there is a bad air leak, or the petrol pipe or jet is partially stopped up. Are you sure, also, that the inlet valves are working well, that their springs have a more or less equal tension, that they open to the same degree, and are not unduly worn? These are points which should be checked.

**Timing.**

**Q** I shall be glad if you would give me your opinion of the following trouble with my  $3\frac{1}{2}$  h.p. twin J.A.P. engine. For several months it has been running well, but about a week ago it pulled up sharply on a slight gradient, and there was spitting back through the carburetter. On examination I found that a nut which holds the pin on which the front cylinder cam wheel runs had come off. To get this on, the guard and chain of the magneto drive had to be removed. I also removed the cover of the timing case and checked the position of the timing wheels; these are correct. On re-assembling I found the power had gone altogether, except on a gradient. The magneto and carburetter are both in good order and clean, and the valves operate well. Is this timing correct? With the magneto practically fully advanced, the plug sparks with the piston right at top of the compression stroke? This is how it is timed at present. I may add that advancing or retarding the magneto has practically no effect on the engine speed, even when running free. The spark at both plugs is very healthy. I cannot fathom the trouble, as it came on so suddenly, there being no gradual dropping off in power. I tried short-circuiting first one and then the other of the cylinders on the stand, but both seemed to be pulling the same. Both cylinders are getting well oiled.—R.E.M.

Evidently the timing wheel for the spark is timed too late. This accounts for the loss of power. The magneto should be timed so that with the spark two-thirds retarded the points of the magneto contact breaker are about to separate with the piston at the top of the stroke.

**The Reason for a Hollow Gudgeon Pin.**

**Q** Would you kindly inform me whether there is any reason for a hollow gudgeon pin in a two-stroke engine, or whether it is only for lightness? One of these motor cycles recently developed a blow back, which I traced as follows: As the gudgeon pin passes the inlet port the compressed gas in the crank case rushes out through this pin, consequently there is a great loss of power together with an abnormal consumption of petrol. As there does not appear to be any wear in the pin, I am thinking of stopping the ends of the hollow pin by means of a brass bolt through the pin, with leather washers to keep it gastight, unless, of course, there is a reason for the pin being hollow. If so, there is no alternative but to have a new gudgeon pin fitted.—W.R.H.G.

The reasons for a hollow gudgeon pin are lightness and ease of lubrication. You could safely plug up each end with brass, provided there was a tiny hole to allow the adequate lubrication of the small end. Leather washers are not required.

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THE MOTOR CYCLE

**Economy and Utility**

NUMBER.

**JUNE 29th, 1916.**

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**The Fitting of Piston Rings.**

**Q** I recently ordered some piston rings for an 8 h.p. motor bicycle, and was told by the firm from whom I ordered them that they should be fitted without a gap when the cylinder is cold. This caused me considerable surprise, as I always understood from your valuable journal that the rings should be fitted with a gap of, say,  $\frac{1}{16}$ th of an inch, to allow for expansion and to prevent seizure of the piston. Will you kindly let me know what is the procedure of the best manufacturers? I presume that the firm considers that the cylinder gets heated quite as much or more than the rings, and consequently expands equally with it. This may be so at the top of the stroke, but at the bottom of the stroke that portion of the cylinder in contact with the rings at this point would be cooler than the rings. Please state the maximum temperature in the cylinder and the expansion of cast iron ring  $10\frac{1}{2}$  in. in circumference.—E.J.H.

There should be a gap of, say,  $\frac{1}{16}$ th of an inch when you fit the piston ring. This is the usual practice. The maximum temperature in the cylinder with a compression of, say, 75 lb. per square inch will be about 400° C., the expansion of iron being roughly about 1 mm.

per foot. It is obvious that the bottom of the cylinder would be cooler than the top, owing to its being farther from the point where the explosion takes place.

**Protection for the Eyes.**

**Q** Can you recommend a suitable pair of goggles for a one-eyed rider which will obstruct the view as little as possible? Something is necessary to protect the eye from flies.—L.F.K.

We think that the celluloid guards made in one piece would meet the case most satisfactorily. These are not exactly goggles, and do not curtail the view to the same extent. They can be bought from all dealers.

**RECOMMENDED ROUTES.****NORTHAMPTON TO TILSHEAD, WILTS.—O.**

Northampton, Blisworth, Towcester, Brackley, Oxford, Faringdon, Swindon, Beckhampton, Devizes, Tilshead. Approximately 100 miles.

**CHESTER TO HARROGATE.—J.A.**

Chester, Frodsham, Warrington, Wigan, Preston, Whalley, Clitheroe, Gisburn, Skipton, Harrogate.

**WORCESTER TO SALISBURY.—C.K.**

Worcester, Tewkesbury, Gloucester, Stroud, Nailsworth, Bath, Wolverton, Warminster, Wilton, Salisbury.

**RUGBY TO MARLBOROUGH.—A.B.**

Rugby, Dunchurch, Southam, Banbury, Chipping Norton, Burford, Lechlade, Highworth, Swindon, Marlborough. Approximately 85 miles.

**SHEFFIELD TO LLANDUDNO.—J.A.P.**

Sheffield, Grindleford Bridge, Eyam, Tideswell, Buxton, Macclesfield, Knutsford, Northwich, Chester, Mold, St. Asaph, Rhyl, Llandudno. Approximately 130 miles.

**CHISLEHURST TO LYME REGIS.—F.G.S.**

Chislehurst, Bromley, Beckenham, Elmers End, East Croydon, straight across the main road until you join the tramlines leading to Carshalton; Sutton, Cheam, Epsom, Leatherhead, Guildford, Hog's Back, Farnham, Alton, Alresford, Kingsworthy, Winchester, along the Southampton road to Basset, Shirley, Totton, Ringwood, Wimborne, Bere Regis, Dorchester, Bridport, Lyme Regis.

**MIDDLESBROUGH TO EXETER.—F.J.T.**

Middlesbrough, Stokesley, Thirsk, Boroughbridge, Wetherby, Aberford, Doncaster, Tickhill, Worksop, Mansfield, Nottingham, Long Eaton, Isley Walton, Whitwick, Coalville, Hinckley, Coventry, Warwick, Stratford-on-Avon, Evesham, Winchcomb, Cheltenham, Stroud, Nailsworth, Bath, Chewton Mendip, Wells, Glastonbury, Bridgwater, Taunton, Wellington, Cullompton, Exeter. Approximately 360 miles.

**PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.**

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always having their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

# "THE MOTOR CYCLE" RECRUITING SECTION.

M.M.G.S. and H.S. M.G.C. closed to Recruits until Further Notice.

Change of Central Office for R.E. Despatch Riders.

This section was instituted with the sole object of assisting readers and directing them to the many different branches of the Army and Navy, for which their special knowledge suited them. At the outbreak of war numerous letters reached us (and continue to arrive) from men at home and overseas possessed of motor engineering knowledge, explaining their difficulty in obtaining particulars of Specialised Sections (notably the Motor Sections), recruiting officers being invariably occupied by the demands of the line regiments. The Editor is Inspecting Officer for the M.M.G.S., Heavy Section, Machine Gun Corps, and R.E. Despatch Riders. Throughout, the work has been purely honorary, and Recruiting Commissions have not been accepted. To date 9,820 readers have taken advantage of our proffered assistance.

IT was announced in our last issue that recruiting for the Motor Machine Gun Service and also the Heavy Section, Machine Gun Corps, had closed for the time being. The short notice was unavoidable, and based upon telegraphic instructions received. Many readers have been disappointed, it would appear from correspondence which continues to flow in.

At Coventry on Tuesday last week, a goodly number of experienced men presented themselves, and the Editor was able to make special arrangements for the men to be sent on to Birmingham by warrant, in order to be tested for the Royal Flying Corps, which is open for men of most R.F.C. trades, as well as car drivers. All the men were trade tested by the special R.F.C. recruiting party in charge of Lt. Goode, and those found proficient accepted for that popular branch of the service.

Next day, at Manchester, Mr. Geoffrey Smith received telegraphic instructions to select a score of the most experienced men for the Motor Machine Gun Service, and a list is given hereunder:

Albinson, B., Hollinwood.  
Butler, J., Heywood.  
Chambers, H. W., Bangor.  
Crappier, E. R., Bamford.  
Davies, W. R., Rochdale.  
Dunsmuir, K. M., Hale.  
Entwistle, J. S., Darwen.  
Frankland, A., Guiseley.  
Garlick, J., Clitheroe.  
Gent, F. A., Brooklands, Manchester.  
Hutcheson, T., Newcastle-on-Tyne.  
Kelsey, F. R., Manchester.  
Mawson, J., Otley.  
Moorcroft, H., Manchester.  
Richardson, T., Newcastle-on-Tyne.  
Robinson, T. W., Middlesbrough.  
Sawyer, G. H., Bradford.  
Shaw, M. G., Kendal.  
Swarbrick, J. W., Chorley.  
Thornton, G. R., Clay Cross.  
Wild, G., Rochdale.  
Young, F. D., Cheadle.

Readers should note that there are no immediate vacancies in the M.M.G.S. and the H.S. M.G.C., but when further men are required an announcement to that effect will appear in these columns. Meanwhile, it should be noted by practical men that the A.S.C., M.T., as well as the R.F.C., require recruits.

Applicants accepted at the beginning of last week prior to the notice to close recruiting include:

Fowke, C. E., Stafford.  
McGhie, W. I., Coventry.

## ENLISTMENT OF DESPATCH RIDERS.

OWING to the introduction of universal service the work of the Central Office, Motor Cyclist Reserve Com-

mittees, has practically come to an end. In future all applicants for enlistment as motor cyclist despatch riders, R.E., from the London district and Overseas, should apply direct to the O.C. Dunstable Signal Depot, R.E., Dunstable, Beds. Applicants from other districts should for the time being apply to the Secretaries of their local motor cyclist Reserve Committees, a revised list of which is as follows:

HOME COUNTIES DIVL. AREA.	Rev. F. W. Hassard Short, 3, Watling Street, Dartford.
EAST ANGLIAN DIVL. AREA.	Capt. R. Wilson, O. i/c Administrative Centre, Ashburnham Road, Bedford.
IRISH COMMITTEE.	Lt. J. D. Weir, Headquarters, Irish Command, Parkgate, Dublin.
NORTHUMBRIAN DIVL. AREA.	Major P. S. Harrison, Drill Hall, Hutton Terrace, Sandyford Road, Newcastle-on-Tyne.
NORTH MIDLAND DIVL. AREA.	Capt. H. L. Wheeler, D.S.O., 2, Market Square, Stafford.
WEST RIDING DIVL. AREA.	Lt. C. W. Wilson, 63rd Divl. Cyclist Co., Babworth Camp, Retford.
HIGHLAND DIVL. AREA.	Capt. John Stuart, 8, Kin-nould Street, Perth.
LOWLAND DIVL. AREA.	Major A. A. McBean, R.E., 21, Jardine Street, Glasgow.
SOUTH MIDLAND DIVL. AREA.	Sec.-Lt. H. Smith, R.E., 6, Brynland Avenue, Bishops-ton, Bristol.
WELSH DIVL. AREA.	
WESSEX DIVL. AREA.	Capt. W. McD. Allardice, Army Inspection Dept., Armoury Road, Small Heath, Birmingham.
EAST LANCASHIRE DIVL. AREA.	Capt. E. H. Wray, R.E., Depot E. Lancs. R.E., Old Trafford, Manchester.
WEST LANCASHIRE DIVL. AREA.	Mr. S. W. Philpott, 22, Rodney Street, Liverpool.

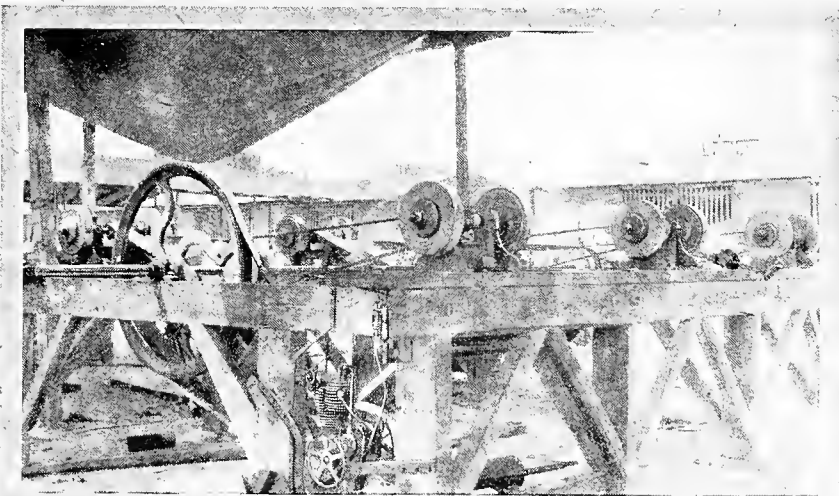
## Appreciation of the Army Council.

In a letter to Mr. T. W. Loughborough, secretary of the Auto Cycle Union, who has been responsible for the work of the central office during the last six months, the Army Council states that it is "cognisant of the good work done by the Auto Cycle Union in the past, and much appreciates the results which have been obtained as regards the recruiting of motor cyclists."

Mr. Loughborough has also received a letter from Col. R. H. H. Boys, expressing thanks.

## THE ADAPTABLE MOTOR CYCLE ENGINE AGAIN.

WE are able to present our readers with another instance of a motor cycle engine successfully doing work for which it was never intended. In this case it is a Rudge 3½ h.p. engine that is used for driving the belting of a bayonet cleaning machine in Egypt. It was taken from a motor cycle that was badly damaged at Gallipoli, and we are told that it is doing well in its new sphere. The big flywheel, on the left in the photograph, was taken from an old pump standing in the market place at Alexandria, and a groove was cut in the wheel for the belt. Twelve emery and leather wheels and huffs are driven in this manner. The photograph has been sent by Staff-Sgt. Wright, at present in Egypt with the Army Ordnance Corps, who, we understand, was responsible for the arrangement.



THE ADAPTABLE MOTOR CYCLE ENGINE.

A 3½ h.p. Rudge motor cycle engine driving machinery for cleaning and sharpening bayonets.



## NEW ALLON MODELS.

Road Trial and Details of a Remarkable Twin Two-stroke Machine made by an Old-established Birmingham Firm. The Latest 4 h.p. Four-stroke Alldays-Allon.

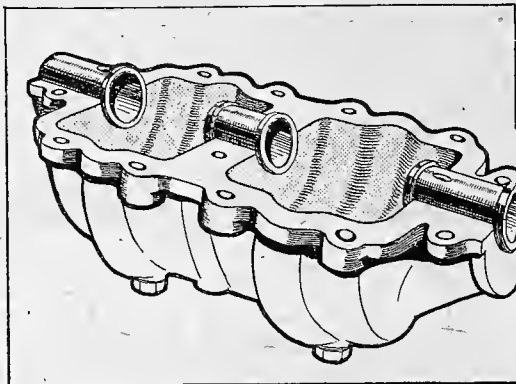
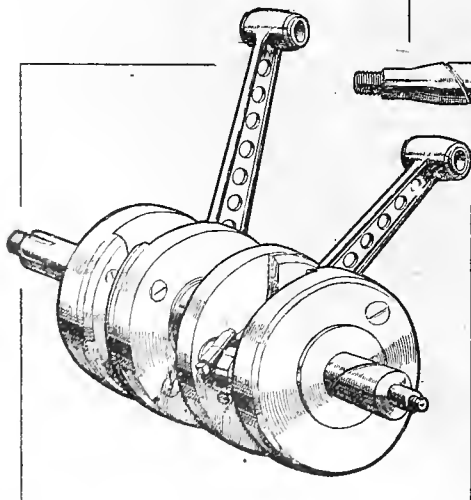
THE appearance of a new two-stroke machine of the single-cylinder type is nothing unusual nowadays, there being different makes innumerable, but the twin-cylinder machine has been left severely alone by most makers, and it remains for a few firms, given to much experimental work, to introduce a novelty of this kind.

Messrs. Alldays and Onions, of the Matchless Works, Birmingham, have now in course of manufacture an excellent model of the twin type. Their lightweight single two-stroke Allon needs no recommendation. It is very well-known, and when it is said that the new twin incorporates all the workshop and road experience gained with the lightweight, coupled with the usual first-class workmanship which characterises the products of this factory, it will be readily understood that the new model is a really good thing. There are practically no additional complications, and it is in effect merely a doubling of the single-cylinder with necessary alterations to details.

### The Engine.

Following the usual Allon practice, the two cylinders and the upper half of the crank case form a one-piece casting, in itself a clever piece of work. Each cylinder is of the three-port type, bore 70 mm., stroke 76 mm., the pair giving 584 c.c., and rated at 5 to 6 h.p. Two separate inlet ports are placed close together at the back of the engine between the projections in the casting which form the transfer ports, and are covered with one inlet manifold. Easy access to the transfer ports is provided by two openings, with plate caps and bolts adjoining the inlet ports. The exhaust ports are also covered by a one-piece casting, provided with cooling fins, and leading to a single pipe and silencer

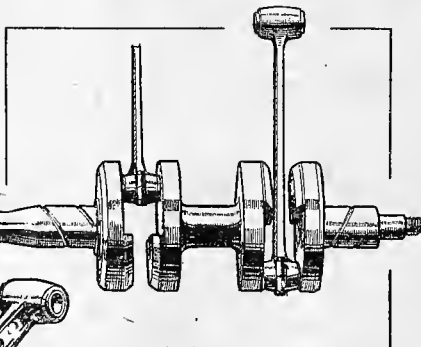
The Allon crankshaft from two aspects, with balance weights attached.



Detachable crank case with phosphor bronze bushes in place.

with an extension pipe having a flattened end. Lubricating ways are provided in the casting, the oil being fed to a central point, and then diverted to either side to the main bearings.

The crankshaft is a good piece of work, being formed in one piece with four internal flywheels, these being in addition to the usual outside wheel. Balance weights are bolted to the inner side of the flywheels. The crankshaft bearings, which run in phosphor-bronze bushes, are of generous dimensions, and no compression leakage need be feared either at this point or at the joint of the under half of the crank case with the main casting. Special attention is paid to this joint. No washers are used, perfect



metal-to-metal surfaces being relied on. The cranks are very neatly made, the web being drilled to reduce weight. Pistons are of the usual two-stroke type with deflector head, two top rings only, and usual type of gudgeon pin.

The two release valves are operated by a double lever controlled by Bowden wire from an ordinary lever on the handle-bar. To prevent overheating, always a serious question in two-strokes, and particularly those with twin engines,

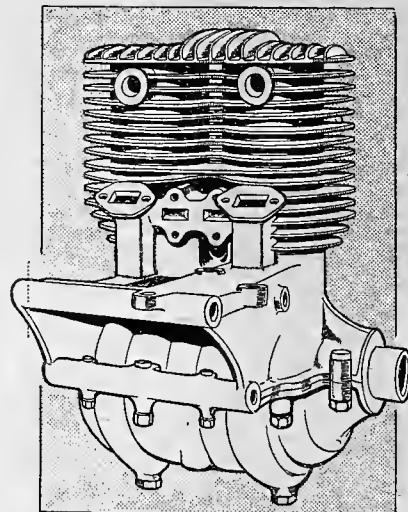
the radiating fins on this engine are ample, a clear air space being formed between the two cylinders. And here it may be noted that, though the machine was run in "free" at varying speeds from normal to high for a space of over five minutes, it yet showed no signs of distress, and would have run no doubt for a much longer time without trouble.

### Other Features.

The engine unit is the principal item, but there are other features worthy of note.

Transmission is by heavy chain to a three-speed countershaft gear box, and thence by lin. belt, over large pulleys, to the usual belt rim. The clutch is of the cork inset type, controlled by grip lever and Bowden cable from the left handle-bar alongside the valve release lever.

The front brake is band applied, and works in a V rim. The rear brake is on car lines, internal expanding metal-to-

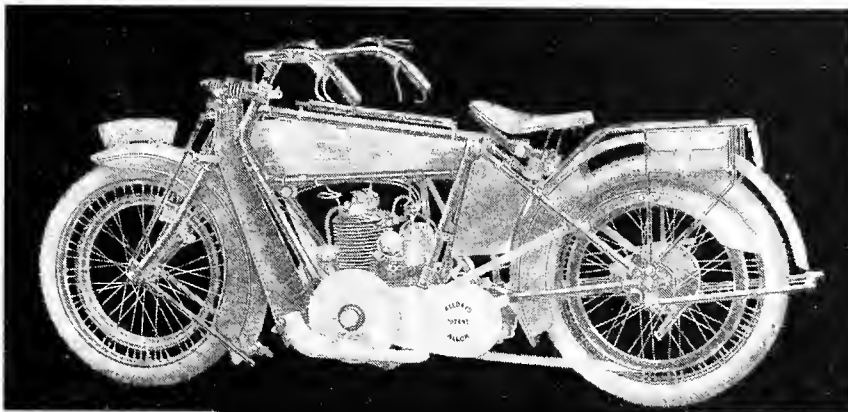


General view of cylinder casting and crank case of the new 5.6 h.p. two-stroke twin-cylinder Allon.

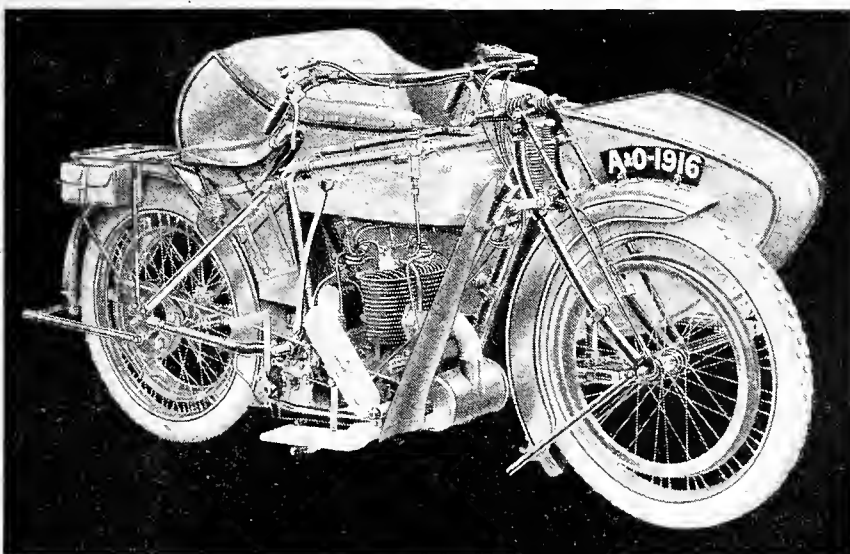
metal, operated by foot lever, the drum and braking surface being of generous dimensions. The magneto is the E.I.C., but the carburetter is not settled upon. Mudguarding is well looked after, and a neat guard over the top of the belt rim will no doubt go far to keep the belt free of mud. If we may offer a suggestion, it is that a good wide undershield, preferably in one piece with the leg shields, would add to the general appearance, and effectively combat the mud nuisance. Wheels, tyres, tank, etc., all are of good type and need no comment.

**New Allon Models.—**

We were not able, in the time at our disposal, to make an exhaustive test on the road, but a short trip on the outskirts of Birmingham served to show the Allon's paces, and, despite the fact that, like the usual works test machine, it had been severely handled with a consequent loss of tune, yet it easily pulled a heavy sidecar and a twelve stone passenger at a speed which was quite fast enough for safety. A speed of 30 m.p.h. was easily maintained at half throttle, and its limit is probably in the neighbourhood of fifty miles per hour. The exhaust produces a remarkable drone, not excessively loud, and like nothing else but an aeroplane engine, the unusual note attracting attention; it was amusing to come across people staring into the sky, and to see their surprise on finding that a motor cycle was the cause of the familiar hum. Our run included one hill of fair gradient, about 1 in 9 or 10 at the steepest part



The 5-6 h.p. vertical twin-cylinder two-stroke Allon, which is described in the accompanying article. The cylinder capacity is 584 c.c.



The new 5-6 h.p. Allon as a passenger machine. Robust construction, neat design, and excellent mudguarding are points that appeal to one in glancing at this picture.

for 200 yards, of no real value as a test hill, but sufficient to demonstrate the engine's climbing power. The climb was not so fast as expected, partly on account of being baulked half way up, and partly from the want of tune before mentioned. Still, it left no doubt of the way it could climb, and this bill, as well as many other stiffer propositions, have been taken easily on top gear at well over the legal limit with sidecar and passenger, whilst the reserve gears enable the machine to climb any main road gradient.

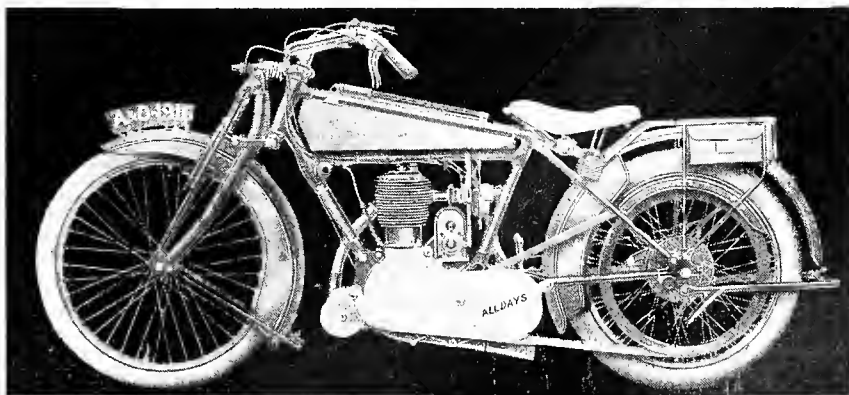
**Easily Managed and Controlled.**

The handle-bar clutch control was particularly useful in traffic dodging, and the machine is practically no more difficult to manage than an ordinary two-stroke lightweight. The kick starter is very efficient, and the engine never once failed to start at the first kick. It is fairly economical; sixty miles per gallon can be obtained with the sidecar attached. Only a few test machines are running at present, but the model will be on the

market almost immediately; in fact, a number of the first orders are about to be completed, and in a few weeks time many of these interesting machines will be seen on the road. To the man who hankers after the simplicity of the two-stroke lightweight, coupled with the reserve power necessary for sidecar work, it is just the thing. We are hoping to give this machine a more exhaustive test in the near future.

**Other Models.**

Messrs. Alldays' other models are the single two-stroke lightweight Allon and the four-stroke 4 h.p. single-cylinder Allon. The latter is a well-designed mount, sturdily built, with plenty of reserve power, 86 mm. bore, 95 mm. stroke. The frame has a sloping top tube similar to the lightweight model, and it gives a very comfortable riding position. Transmission is by chain to a three-speed countershaft gear, and thence by 1in. belt. The handle-bar-controlled clutch and kick starter make for easy control, and the braking system is most efficient, the back brake being of the internal expanding type. The equipment generally is first-rate, and the whole goes to form a very attractive solo or sidecar mount of the "go anywhere" kind.



The big single-cylinder four-stroke 4 h.p. Alldays-Allon. It is provided with the popular chain-cum-belt drive and countershaft three-speed gear. The engine dimensions are 86 mm. x 95 mm. = 552 c.c.



## TIME TO LIGHT LAMPS

"SUMMER" TIME.

June 15th	...	...	9.46 p.m.
" 17th	...	...	9.47 "
" 19th	...	...	9.48 "
" 21st	...	...	9.48 "

### A Surrey Road Warning.

Several members have recently reported to the Automobile Association the existence of a control between Ewell and Epsom, at Half-mile Bush.

### Fast Times in California.

At Fresno, California, a five miles race for amateurs was won by J. H. Hess on a Harley-Davidson in 5m. 32s. E. Tice, also on a Harley-Davidson, won the club race over the same distance, his time being 4m. 27s.

### Stolen Machine.

A new Ryder-Jap machine was stolen from Messrs. Rider Troward and Co., of Hampstead, last week. It was a 1915 model, fitted with Albion two-speed gear box, Senspray carburetter, Dixie magneto, Dunlop and Avon tyres. The registration number was 1T 364, but this may have been altered.

### Another Wounded Soldiers' Outing.

The owner of an Enfield sidecar, Mr. Alfred Taylor, of 81, High Street, Thornton Heath, has for a long time been taking out wounded convalescent soldiers from various hospitals in Croydon and the adjoining neighbourhood. Prompted by our successful Belgian wounded soldiers' outing, organised just a year ago, which was the first of its kind, and by the excellent example of the Harley-Davidson Motor Co., Mr. Taylor has requested us to help him organise an outing of a similar nature.

The idea is to assemble beneath the clock close to Thornton Heath Station in High Street, Thornton Heath, at 2 p.m. on Wednesday, July 5th. Being an Enfield rider, Mr. Taylor hopes that as many owners as possible of this make of machine will turn up, but, of course, riders of any make will be heartily welcomed. Every rider is requested to bring a spare coat and a pair of goggles for his passenger, and also to stand the expense of entertainment, which should not exceed 1s. The destination suggested is the Brambletie Hotel, Forest Row, where tea will be served. This makes an exceedingly pretty run, and it is hoped that as many sidecar owners as possible, to the number of, say, thirty or forty, will put in an appearance. Those willing to attend should send in their names to *The Motor Cycle*, marking the envelopes "Red Cross"

## SPECIAL FEATURE

THE ACTION OF A TWO-STROKE ENGINE SIMPLY EXPLAINED.  
MORE SPORTING REMINISCENCES.

### "Summer Time" Means Fewer Accidents.

A London coroner, Mr. S. Ingleby Oddie, says that since daylight saving has been in force there has been a marked diminution in the number of street accidents.

### A New Index Mark.

Motor vehicles registered in Middlesex from now onwards until further notice will bear the index letters MC. The letter H was first assigned to Middlesex, being followed by MX.

### The Pressman's Friend.

In the effort of daily newspaper men to find the quickest means of getting copy and photographs to headquarters, the motor cycle has been used with great success. Some typical instances where newspapers have been enabled to secure "scoops" by means of the handy two-wheeler will be given in the Special Economy and Utility Number of *The Motor Cycle* to be published a fortnight hence.

### The A.C.U. Touring Guide.

Owing to the war no new touring guide is being published this year by the Auto Cycle Union, but a twenty-eight page supplement to the 1915-1916 guide, pub-

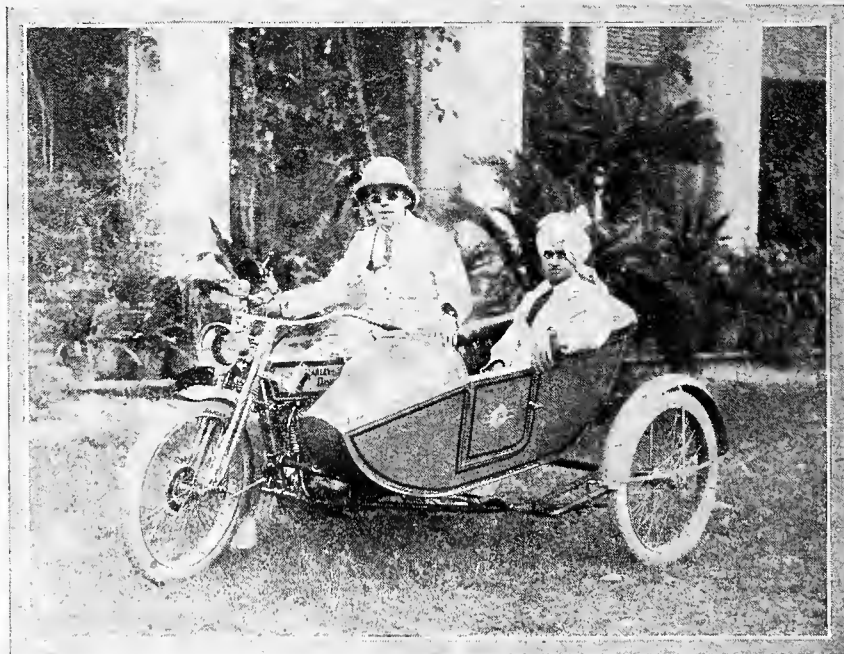
lished last July, has just been issued. The information given in this supplement brings the 1915-1916 guide completely up to date. Perhaps the most useful information it contains is a map showing the restricted lighting areas in England and Wales. We all hope that another year such a map will not be necessary.

### Officer Charged with Stealing Motor Cycle.

A second-lieutenant in the Royal Fusiliers was charged at Dover on Friday last with stealing a motor cycle and jewellery. The officer had been sent home suffering from shell shock, and upon promising to refund the losses he was bound over.

### Motor Cycling in Queensland.

We often chronicle the doings of motor cyclists in Western Australia, Victoria, N.S.W., and South Australia, but seldom anything is heard about the pastime in the great north-eastern State of the Commonwealth. There is a motor cycle club of Queensland that holds regular competitions, though as a result of the war these have been reduced in number. A reliability trial was held recently, the winner being N. G. McNeil (3½ h.p. Rudge).



### THE MOTOR CYCLE IN INDIA

A young Sirdar, a grandson of the Gaekwar of Baroda, being introduced to the delights of motor cycling. The outfit is a Harley-Davidson, and the driver is Percy W. Johnson, formerly a member of *The Motor Cycle* advertisement staff. Mr. Johnson (who writes from Allahabad) says that at present one rarely meets an Indian riding a motor cycle, but there is every indication that the numbers who do so will increase rapidly.

**Recruiting Changes.**

Simultaneously with the closing of the M.M.G. and H.S., M.G.C., for recruits, the Central Office for despatch riders has been changed.

**Petrol Readily Obtainable.**

During a trip to Manchester on recruiting work last week we experienced no difficulty in purchasing petrol at garages *en route*. Our experience is that the shortage is much exaggerated in certain quarters.

**A Rare Photograph.**

A picture on page 568 shows the late Rear-Admiral Sir R. K. Arbuthnot, said to be the only photograph taken of him in naval attire during the past fifteen years, though photographs showing him on a motor cycle, such as appeared in our biography last week, are numerous.

**War Time in Germany.**

Surely we are not so badly off as Germany? The photograph on this page, taken in Berlin, may dispel many illusions. Petrol, it appears, can be spared for powerful pacing motor cycles, and the attendance at the cycle race meeting proves that sport is still indulged in. The people do not strike one as "starving," whilst the summer apparel would show that necessities are not really lacking.

**Petrol Supplies.**

The latest in regard to the petrol position is outlined in this issue. A census of petrol stores and the requirements of motor users was to be taken this week. Many people have been led to suppose that motoring is to be prohibited, but such fears we deem to be groundless. Certainly "pleasure" motoring, what little exists nowadays, may be restricted by limiting petrol supplies, but we do not suppose for an instant that a ban will be placed upon motoring. Motors are too much a part of our daily life to be dispensed with, without causing an entire dislocation.

**A Hundred Miles Road Race in South Australia.**

The Motor Cycle Club of South Australia, Adelaide, ran a successful long distance road race on Easter Saturday, April 22nd. The course was a circular one, starting near Stansbury, and two laps and twenty-four miles made the century. There was a time-limit of three and a half hours.

Results are as follow:

**CLASS I.—Up to 350 c.c.**

		h.	m.	s.
1. A. Limb (2½ Douglas) ..	..	2	53	56½
2. J. H. Gilbert (2½ J.A.P.) ..	..	2	56	9½
3. A. E. J. Klose (2½ Douglas) ..	..	2	56	39½

**CLASS II.—351 to 600 c.c.**

1. W. A. Driver (3½ Norton) ..	..	2	19	35½
2. W. H. Hubbard (3½ Norton) ..	..	2	32	45½

**CLASS III.—601 to 1,100 c.c.**

1. C. E. Nalty (7-9 Indian) ..	..	2	1	19½
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**CLASS IV.—PASSENGER UP TO 600 c.c.**

1. L. S. Eglinton (3½ Kent sc.) ..	..	3	8	5½
------------------------------------	----	---	---	----

C. E. Nalty put up a particularly good performance, as, besides making fastest time, he was the only competitor to have no involuntary stops; he only stopped for petrol and oil.

After the race members of the club held a carnival and concert, the result of which was that £45 was handed over to the local Red Cross fund.

**The National War Funds.**

At the week-end the principal relief funds stood as follow:

The Prince of Wales's National Relief Fund	£5,901,515	0	0
(distributed) ..	£3,318,000	0	0
Fund for the Sick and Wounded	3,854,355	0	0
Tobacco Fund	108,186	10	8
Queen's Work for Women Fund	169,564	10	7

**A Fast Half-mile in Western Australia.**

A Douglas rider, O. Parker, has recently covered the flying half-mile on Lake Perkolilli, W.A., in 28½s. (63 m.p.h.). This, we are informed, is a local record for the 350 c.c. class, the previous best being held by a Sunbeam rider. We have already referred to Lake Perkolilli; it consisted originally of a salt lake, but the red soil from the surrounding hills has gradually drifted over its surface, and this, combined with the salt of the lake itself, has produced a most smooth surface.

**Motor Cycle Taxation.**

A correspondent this week takes motor cyclists to task for their opposition to the proposed taxes. Amongst other things, he says that the man who sells his outfit because of an extra £2 per annum is "cutting off his nose to spite his face." This may be true in some cases, but what about the man who simply cannot afford the extra tax, which may amount to as much as £3 14s. 6d.? Many a motor cyclist would cheerfully pay a double tax, as our correspondent says he intends to do on a light car, for he knows the country requires money. What motor cyclists in general object to is the unfairness and unsuitability of the proposed taxes. It is true that everyone at home ought to be willing to make any sacrifice for those at the Front, but why should one class be singled out to make sacrifices which are beyond their means?

**The Working of a Two-stroke Engine.**

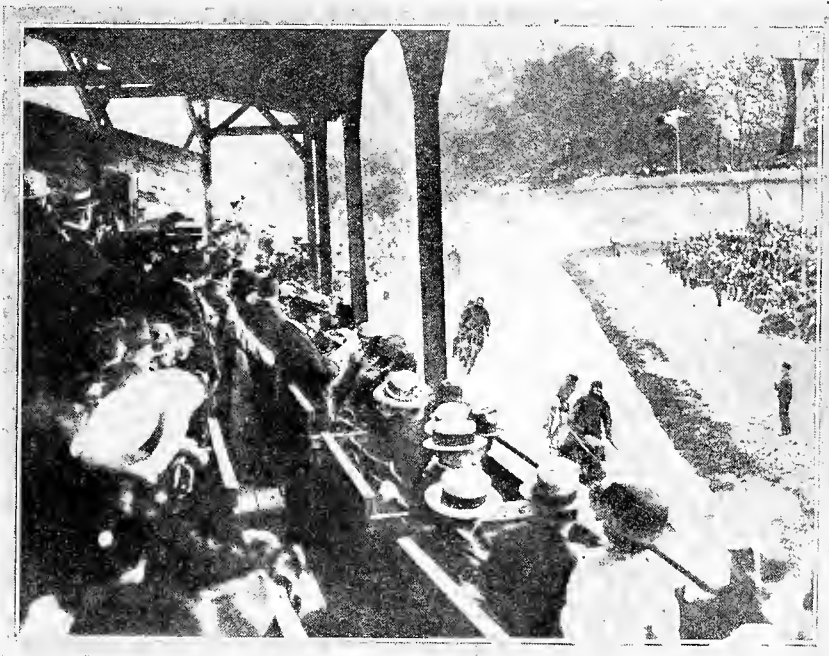
In response to several requests, we give in our centre pages this week an illustrated explanation, in untechnical language, of the operation of a two-stroke engine. A similar description, but dealing with a single-cylinder four-stroke engine, was published in *The Motor Cycle* of March 9th.

**Where the Australians obtain their Motor Cycles.**

Together the six States of the Australian Commonwealth spent in 1915 £103,558 on motor cycles. Great Britain did by far the greater part of the business, motor cycles and parts being purchased from the Home country to the amount of £74,660. The United States came next with £28,438. Unless international affairs assume a different shape much quicker than appears the 1916 figures, we are afraid, will not be quite so favourable to England.

**War Time Repairs.**

Motor cyclists requiring any part of their machines repaired by the manufacturers should take care to find out before despatching the machine or parts whether the firm are in a position to undertake the repairs. We recently heard of a motor cyclist whose two-speed gear had gone wrong. He immediately despatched the gear to the makers. After a few days he received a notice from the firm to the effect that, as they were entirely on Government work, they could not undertake the repair. They therefore refused to accept the gear when delivered by the railway company, the result being that the gear was left lying at the railway station for some time until instructions for return were sent. This caused a delay of more than a fortnight before the repair could be done locally.

**WAR-TIME RACING IN BERLIN.**

A scene at a circular track during a pedal cycle race, the competitors being paced by motor cyclists. The wounded soldiers on the right will be noticed. This photograph may dispel popular illusions. (See paragraph.)



Copyright illustrations of  
THE MOTOR CYCLE.

## THE ACTION OF A AN EXPLANATION IN SIMPLE LANGUAGE OF

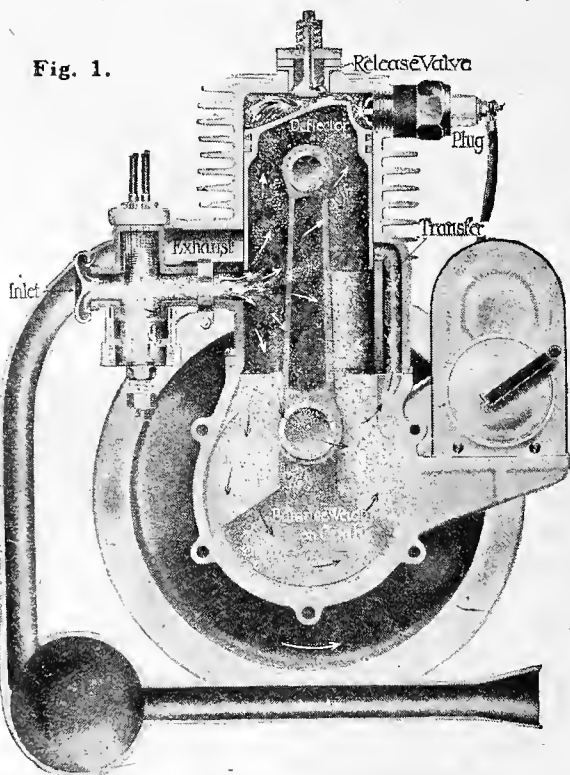
**I**N our issue of March 9th we gave a description and illustrations of the working of a four-stroke motor cycle engine for the benefit of beginners. As lightweight two-strokes are rapidly becoming more and more popular, and their riders are very frequently absolute beginners, we consider it would not be out of place to give a description in simple language of the working of these little engines for the benefit of this section of our readers.

The two-stroke engine, as its name implies, is one which completes its cycle in two full strokes of the piston, and, differing from the usual four-stroke engine, an explosion is obtained every revolution of the crankshaft. As everyone

the cylinder wall through which the gases pass, and they are covered and uncovered by the piston. The usual type of two-stroke engine is that which has three ports, viz., inlet, exhaust, and transfer. The two former are self-explanatory, while the transfer port and passage are a passage and port through which the fresh charge is transferred from below the piston to the top.

The arrangement of the ports on nearly all two-strokes is as follows: The exhaust and inlet ports are usually situated together, in order that the hot exhaust gas shall warm the fresh charge and render better evaporation possible, while the cool incoming gas prevents excessive heat from accumu-

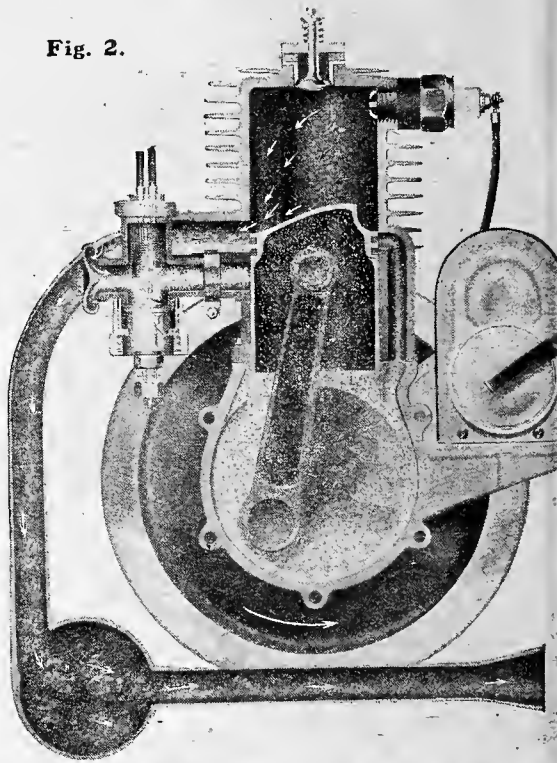
Fig. 1.



*Piston at top—charge fully compressed—spark igniting charge—exhaust port closed—transfer port closed—inlet port fully open—fresh charge rushing into crank case to fill partial vacuum caused by upward travel of piston.*

knows, in order to obtain one impulse four separate operations have to be performed by every type of petrol engine, viz., induction, compression, explosion, and exhaust. In order to obviate four separate strokes of the piston, as in the four-stroke engine, both sides of the piston of a two-stroke are utilised to pump the gas, the top half performing the compression and explosion operations, while the under half draws the gas from the carburettor and pumps it into the cylinder ready to be compressed, the exhaust being left, so to speak, to look after itself, leaving the cylinder partly by its own pressure and partly by the pressure caused by the fresh charge being forced into the cylinder by the crank case compression. These engines have no valves in the ordinary sense of the word. In their place ports are cut in

Fig. 2.



*Piston descending—inlet port closed—transfer port closed—exhaust port just beginning to be uncovered by piston—exhaust gas commencing to leave cylinder under its own pressure—fresh charge in crank case under partial compression.*

lating in the neighbourhood of the ports. However, in whatever position in the cylinder these ports are placed they will be similar as regards the travel of the piston. The lower lip of the exhaust port will be level with the bottom of the piston when at the bottom of its travel. The inlet is situated at a slightly lower level, so that it is not uncovered completely until the piston has reached the high point of the upward stroke. It will, therefore, be seen that the exhaust port communicates with the cylinder while the inlet when uncovered communicates with the crank case. The transfer port is placed on the same level as the exhaust port, but always on the opposite side of the cylinder wall and is usually a rather more shallow opening, the reason being that, although when the piston is at its low

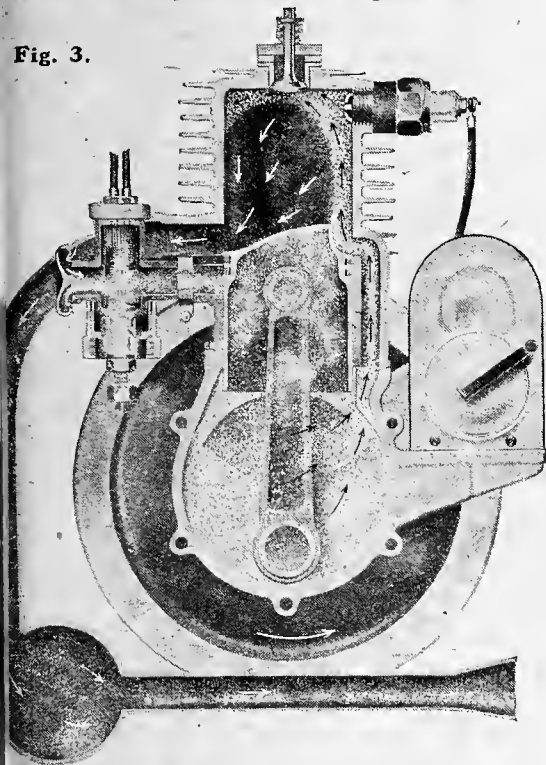
# TWO-STROKE ENGINE.

## WORKING PARTS AND CYCLE OF OPERATIONS.

ent, both transfer and exhaust ports are wide open. The exhaust opens slightly before the transfer, and enables a greater proportion of the burned gas to escape before the transfer port is opened. It will be noticed that the piston top is not flat, but sloping, and with a ridge on the transfer port side. This ridge is known as the deflector, its action being to deflect the fresh gas in an upward direction on its entering the cylinder, thus preventing it from intermingling with the burned exhaust gas which is passing out the exhaust port on the opposite side of the cylinder. There being no exhaust valve, provision has to be made to release the compression for starting purposes. It is,

the meantime the piston in its upward travel has caused a partial vacuum to be formed in the crank case. It will be seen that upon the piston reaching the top of the upward stroke the inlet port has been uncovered, the result being that a fresh charge of gas rushes into the crank case to fill this partial vacuum. It should be noticed that the lower portion of the piston covers both the exhaust and transfer ports during the whole of this upward travel of the piston.

Figs. 2 and 3. The spark having taken place, igniting the gas, causing it to expand violently, the piston is forced in a downward direction, rotating the crank and at the same time partly compressing the new gas which has been drawn

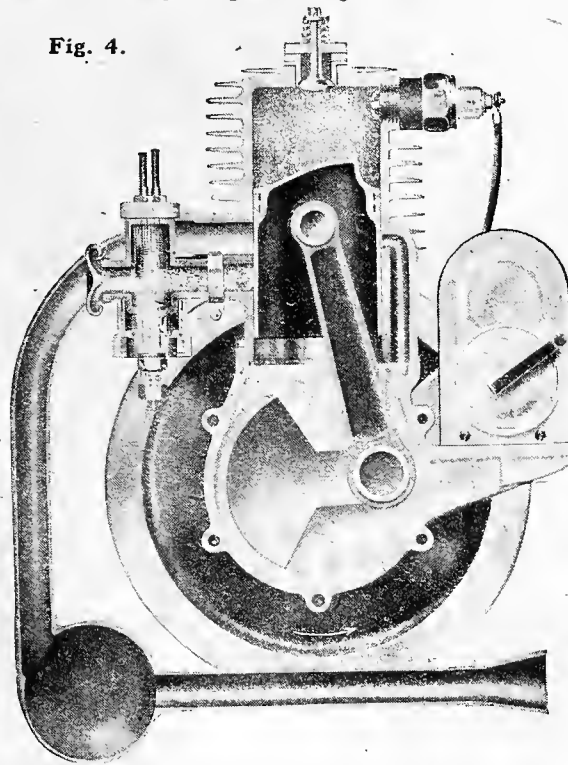


*Piston fully descended—exhaust and transfer ports open—fresh charge, indicated by black arrows, being forced up transfer passage and deflected in an upward direction by deflector—remainder of exhaust gas being expelled, assisted by pressure of fresh charge.*

before, necessary to fit a small mushroom-headed valve the cylinder, through which the compression may be released when necessary. This will be noticed in the illustrations, situated in the cylinder head.

The general construction of a two-stroke engine is very similar to the four-stroke, only very much more simple. A great feature of a two-stroke is, as previously mentioned, the absence of valve mechanism or timing gear.

The sequence of operations is as follows (assuming that a charge of gas has already been forced into the cylinder): Fig. 1. In this illustration it will be seen that the piston has travelled in an upward direction, compressing the gas in the cylinder, ready to be ignited by the electric spark at plug upon the piston reaching the top of its stroke. In



*Piston commencing to rise—fresh charge in cylinder being compressed—partial vacuum being formed in crank case—all three ports closed.*

into the crank case. Upon the piston nearing the end of its stroke (fig. 2), the exhaust port is uncovered, and the burned gas commences to rush out into the silencer and thence into the air. Upon the piston reaching the end of its downward movement (see fig. 3) it has uncovered the transfer port, upon which the compressed gas in the crank case is forced up the transfer passage and so enters the cylinder. It is deflected in an upward direction by the piston deflector, and so prevented from following the exhaust gas out of the exhaust port. Incidentally, the pressure of the incoming gas assists in forcing the remainder of the exhaust out of the cylinder.

Fig. 4 shows the commencement of the up stroke, and the sequence of operations is repeated.

## THE PETROL SUPPLY.

A Modified Priority List sent to all Garage Owners and Petrol Dealers.

THE absorbing topic, next to the war, at present among motor cyclists is the petrol question.

The Petrol Control Committee appointed by the Board of Trade continues its deliberations, and beyond the priority scheme of supply nothing definite has been announced. Restrictions there may be in the future, but reports of the stopping of motoring altogether for other than war workers in one form or another are entirely erroneous.

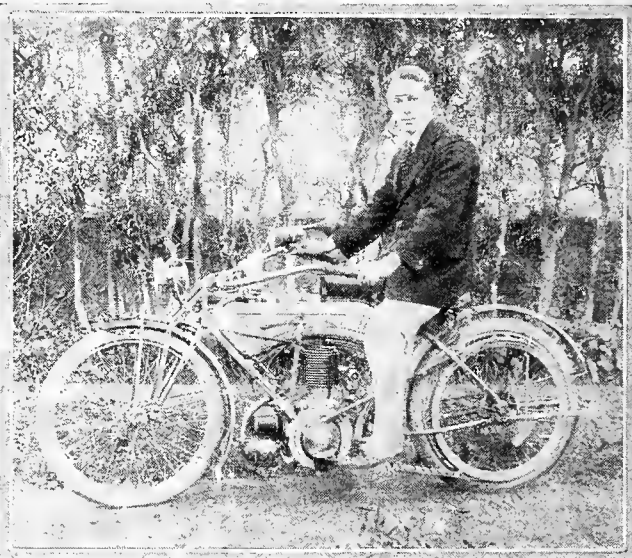
Last week we published on page 541 the priority list for the distribution of petrol as arranged by the Petrol Control Committee. Since then a special distribution sub-committee has been formed consisting of representatives of the principal motor spirit importers. This sub-committee has circularised all garages and petrol dealers, giving instructions as to the preferential supply of petrol, and a priority list (the former one modified) has been included in the letter.

TO GARAGES AND DEALERS IN MOTOR SPIRIT. ORDER OF PRIORITY FOR DISTRIBUTION OF MOTOR SPIRIT.

Dear Sir(s).—Acting on instructions received from the Petrol Control Committee, we beg to inform you that the following list of customers, whom you may be in the habit



The late Sir R K. Arbuthnot, Bart., C.B., M.V.O., taken at Newcastle when he was in command of H.M.S. *Lord Nelson*. Great gratification was expressed when the *Gazette* of last Friday announced that the appointment of Sir Robert to the order of Companion of the Bath had been antedated to May 30th. Admiral Arbuthnot's appointment, being one of the Birthday Honours, was originally dated June 3rd, three days after his death in the naval battle.



A Cape Town reader, Foster Black, who has joined the Union forces as a despatch rider for the German East African Campaign. We have already announced that latest pattern  $4\frac{1}{2}$  h.p. countershaft B.S.A.'s are being used for this campaign. Foster Black's civilian mount is an Iver Johnson, an American make little known in England, on which he is seen above.

of supplying, are entitled to and must receive preference in supply:

CLASS A.—Includes requirements for or by—

Lords-Lieutenant, High Sheriffs, and any services certified by a Government Department to be essential.

The carriage of munitions of war or materials for munitions of war.

Medical practitioners.

Fire Brigades and ambulances.

Motor cars used by or under the authority of the Red Cross Society or the St. John Ambulance Association, or any other society approved by the Admiralty, or Army Council for the conveyance of wounded or sick members of any of His Majesty's Forces.

Police and Local Government authorities.

Veterinary surgeons.

CLASS B.—Includes requirements for or by—

Agricultural machinery.

Motor cabs plying for hire.

Motor cars used by commercial travellers for business purposes.

Stationary engines (including lighting sets).

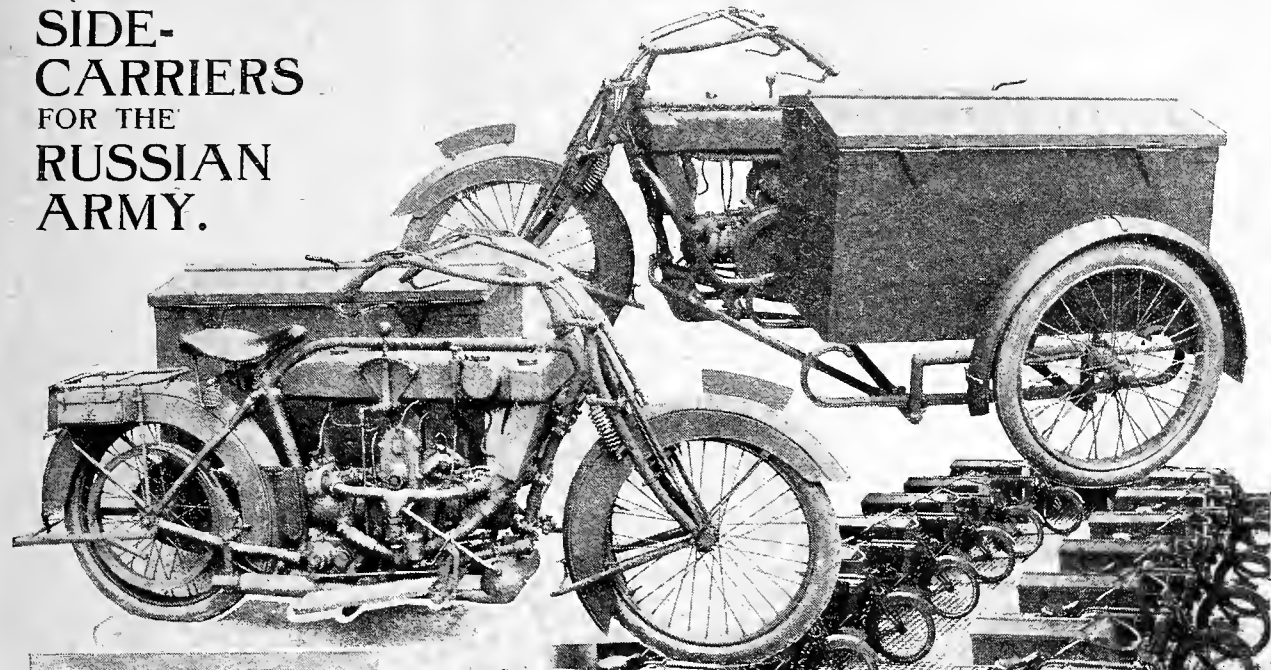
Motor fishing, cargo, and passenger boats other than boats running pleasure services.

We have therefore to request you to carry out the Committee's instructions, which are essential in the general interests of the country, and your failure to assist in this matter can only result in other steps being taken which may greatly interfere with the welfare of the trade generally.

Needless to say, petrol left after the above needs have been satisfied is for the use of motorists using their cars and cycles for necessary recreation.

At the time of going to press no definite date has been decided on which to take the proposed census of petrol, though it was rumoured a few days ago that it would be one day this week. When definite arrangements have been made official announcements will be made in the daily press, and all users will probably have to obtain forms from post offices on which to fill in their individual requirements.

## SIDE-CARRIERS FOR THE RUSSIAN ARMY.

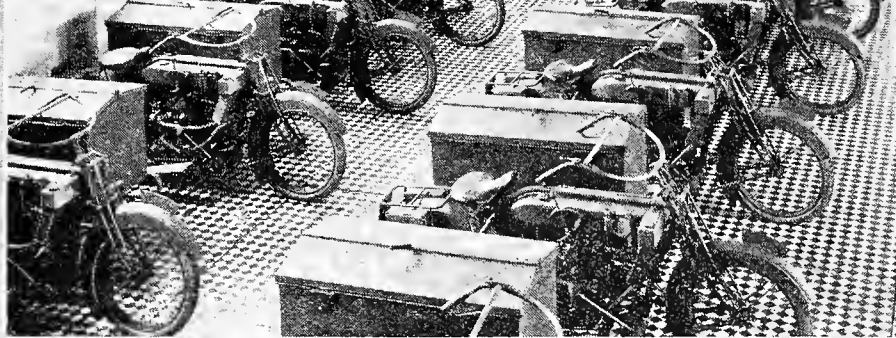


### LARGE ORDER OF BRITISH MACHINES.

**W**E recently had the pleasure of inspecting the first batch of most business-like sidecarriers, representing a portion of a much larger consignment of similar vehicles being supplied by Messrs. Humber, Ltd., for the use of the Russian military authorities. The outfits consist of the 6 h.p. horizontal water-cooled twin motor cycles, which have most substantial sidecar chassis attached, supported on very heavy springs, and carrying large box bodies. The lids open in two halves. The outfits are finished entirely in khaki, every part being painted.

The mechanical details of the machines are as on the standard horizontal twin-Humbers; water-cooled cylinders, three-speed gear boxes, and handle-starting through the 2 to 1 gear. Entirely enclosed chain drive is used, and in order to lessen the harshness of the drive at slow speeds a shock absorbing device is arranged in the rear driving sprocket. The thermosiphon water cooling is most efficiently carried out on these machines, and the radiator, which is of ample size, is carried immediately behind the steering head, and has a capacity of one gallon.

Small car type Claudel-Hobson carburettors are fitted, the control, therefore, being of the simplest, as the throttle lever is all that has to be attended to, while the pilot jet fitted ensures a tilt over when running in "free." The rear wheel brake is most powerful, an extra large shoe working on the inside of the V of a special belt rim on the right-hand side of the wheel. Druid pattern spring forks are used.



### HUMBER SIDECARRIERS FOR THE RUSSIAN ARMY.

The illustrations show only the first batch of a large order that the famous Coventry firm has received from the Russian Government. A 6 h.p. horizontal twin-cylinder water-cooled engine provides the power.

Besides the Humber machines that have been supplied to the Russian Army and illustrated herewith, we are informed that a consignment of two-stroke single-gear Coventry Eagles have also been delivered to the same Government. British motor cycles are also favoured in France, and quite recently the French War Office has added a number of 4 h.p. Sun-Jap machines to the Flying Corps.

### MOTOR CYCLING BEATS FLYING.

Lt. F. M. C. Houghton, R.F.C., who was the joint secretary of the successful B.M.C.R.C. Services meetings last year, has been transferred from the Cyclists' Battalion to the Royal Flying Corps. His experiences are quite interesting. "It is now a month," he writes, "since I forsook the saddle for the observer's seat, and I like the work well enough. The first time up was not in the least what I imagined it would be.

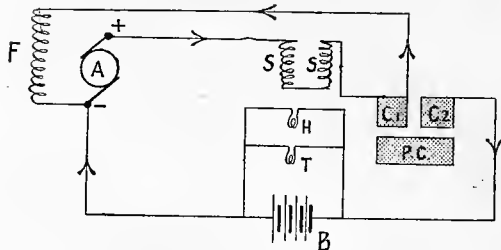
"In my own opinion, motor cycling beats flying all along the line, because you do realise you are moving when you can see the earth slipping away underneath. Of course, this is an observer's point of view."



# THE TREDELECT LIGHTING DYNAMO.

## A Simple and Inexpensive Means of Lighting a Motor Cycle.

THE adoption of self-contained electric lighting systems has naturally been slower on motor bicycles than upon cars, where the bulk of the apparatus and its weight are of less importance. A new type of lighting dynamo, specially built for motor cycles, has, however, been recently manufactured by the Tredelect Engineering Co., of 11, Linden Arcade, High Road, Chiswick. The machine is designed to retail at three guineas, which includes the cut-in, but does not include the accumulator or the lamps. Its output is rated at  $3\frac{1}{2}$  ampères at 4 volts, which suffices for the lighting of a head lamp, side lamp, and tail lamp, and is therefore adequate for a sidecar combination. The outside dimensions of the dynamo are  $4\frac{1}{4} \times 3\frac{1}{4} \times 6\frac{1}{2}$  in. long, and its total weight is about 8 lb. One of its distinctive features is that, unlike the car lighting dynamos of the same make, which run



Wiring diagram of the Tredelect motor cycle lighting dynamo.

on ball bearings, it is fitted with bearings of a special quality of carbon, similar to that used on large steam turbines. Prolonged tests have proved these bearings to be perfectly satisfactory, provided that no oil is put upon them. Steam or water does them no harm at all.

The accompanying sketch shows in diagram the wiring system of the Tredelect dynamo. The machine itself is of the simple shunt-wound variety. It is fitted with a special regulator to prevent its output becoming too high at big engine speeds. One of its principal features is the cut-in, a fitting which is more commonly called a cut-out.

### The Method of Wiring.

In the diagram it will be seen that the current flows from the positive terminal of the dynamo A to two coils or solenoids S S, which are wound round soft iron cores magnetically connected across one end by an iron yoke. Across the other end, but not touching, is a hard steel armature, which, of course, becomes a permanent magnet with poles opposite the two solenoids. The movement of this armature is controlled by a spring, and the end of the armature carries loosely the pivoted carbon block shown at P C in the diagram. The spring of the armature is so set that when the voltage of the dynamo is sufficient to overcome that of the accumulator, the armature is pulled up between the solenoids, and the pivoted carbon P C forms a junction between the two fixed carbon blocks C1 and C2. The current from the dynamo, instead

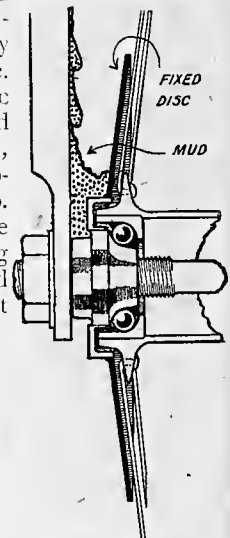
of having to return to the negative terminal through the field coils F, is then able to travel also round the outside circuit to the accumulator B and lamps H and T. If subsequently the speed drops so that there is any tendency for the accumulators to discharge through the dynamo, a point is reached at which current ceases to flow through the coils S S. Just at this moment the armature moves away, and the outside circuit is broken. There is, of course, no sparking, because at the instant there is no current flowing. Consequently, the carbon surfaces remain perfect for an indefinite period without needing any attention.

The whole dynamo is very well constructed with a view to complete reliability without necessitating any attention, and at the same time with the object of keeping down cost. There are no soldered connections on the armature, which can therefore stand a big overload, and the special features of the cut-in certainly form a strong recommendation for the system. We have not tested it on the road, but, after careful examination, we believe the instrument to be one which promises to be thoroughly successful.

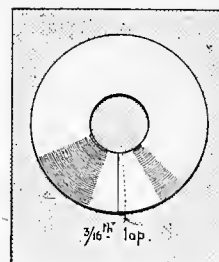
### FRONT HUBS.

#### A MUD-EXCLUDING DEVICE USED AT "THE FRONT,"

ON March 30th we published some particulars and illustrations showing how motor cycle manufacturers make their front hub weather-proof. The accompanying illustrations were sent to us from the Front by E. M. Oliver, and show his method of excluding dirt. This, we understand, has been adopted by many D.R.'s, and has proved most effective. The device simply consists of a disc of tin about 8 in. in diameter, and dished by being cut half way across, the edges then being soldered together, with about  $\frac{3}{16}$  in. overlap. The hole in the centre should be an exact fit on the dust-excluding cap, and the two should be soldered together. With such an arrangement

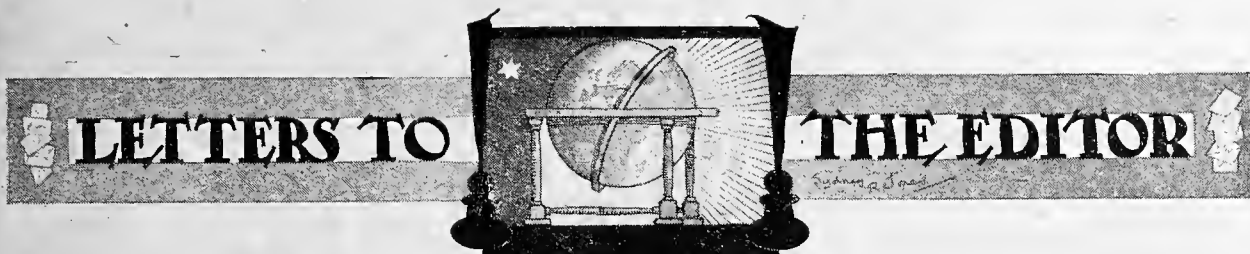


Section showing disc in position. Note how the mud is kept from the bearings.



Disc ready for fitting.

it is obvious that the dirt which runs down the front forks and stays will not be able to gain access to the bearings; on the other hand, it prevents the fitting of a speedometer, but this is of no importance to despatch riders.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

#### Rear Admiral Sir Robert K. Arbutnot, M.V.O., C.B.

Sir,—No words of mine can adequately describe the grief that is shared by all British motor cyclists at the loss of this gallant officer. But only those who were privileged to meet him in competition or to sit with him in committee can fully realise what manner of man we have lost. They need no words to remind them of his character as a sportsman, his early appreciation of the joys and possibilities of the motor cycle, and the charm of his manner.

It was at a dinner of the Auto Cycle Union, so far back as 1910, that Sir Robert fearlessly referred to the German peril, and advocated the military value of the motor cycle. Events have indeed proved the wisdom of his words. And now that he has made the great sacrifice, let us see to it that his loss shall not have been in vain.

T. W. LOUGHBOROUGH.

SECRETARY, AUTO CYCLE UNION.

#### Paraffin as a Fuel.

Sir,—The following gives the general principles of an idea for adapting the ordinary motor cycle carburetter to the use of paraffin, and in respect of its novelty may possibly prove of some interest to your readers. I have, however, unfortunately, had no opportunities for carrying out a practical test, and should be glad to get into communication with anyone having facilities, and who is interested in the subject.

In regard to the employment of paraffin as a fuel in the ordinary carburetter, I assume the principal objections to be as follow:

1. Poor degree of vaporisation (leading to incomplete combustion and its attendant evils), carbonisation, and wear and tear of bearing surfaces.
2. Difficulty or impossibility of starting from cold.
3. Variations in mixture, due to the effect of varying temperatures and atmospheric pressures in cylinder and vaporising chamber on the vaporising point of the fuel.

My idea is intended to obviate these three difficulties. The other objections to paraffin, such as overheating and engine knocking, detonation of charge, etc., are probably inherent in the nature of the fuel itself, and must be met by structural alterations in the engine.

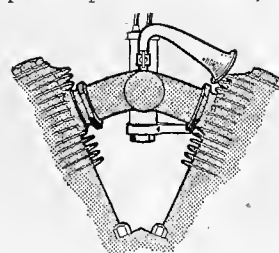
Briefly, I propose inserting in the induction pipe of the carburetter, and immediately over the jet, a fine mesh gauze made from platinum wire, insulated from the metal by means of a fibre ring, and ending in two insulated terminals. Through these would be passed from a battery (kept charged from a small lighting dynamo) a current of electricity sufficient to maintain the gauze at a temperature about the normal ignition point of the fuel. Upon the induction stroke the fuel being violently sprayed through the hot gauze should be completely vaporised into a form ensuring complete combustion and easy starting from cold. The period of time between the induction strokes in a four-stroke engine should be sufficient to counteract any cooling of the gauze as a result of the spray.

At high speeds the effects of increased temperature of vaporising chamber and decreased pressure over jet would begin to appear in a lowering of the vaporising point of the fuel, and this I propose to counteract by the inclusion in the circuit of a mechanically operated rheostat so arranged as to reduce the resistance, and therefore the temperature, of the gauze in proportion as the engine speed increases.

H. A. BROMLEY.

Sir,—Perhaps you will find at least a portion of the following sufficiently interesting for publication.

I have covered to date this year 2,310 miles on petrol-paraffin mixtures, varying from one-fifth paraffin to three-eighths paraffin, the latter being the most I can use without noticeable difference in running. I have used this proportion for the bulk of the mileage, and have very little fault to find with it. The saving is, of course, considerable, as the mixture works out at only about 2s. to 2s. 2d., according to the price paid for the paraffin. I find it pays to use the best paraffin obtainable, either White Rose or Royal Daylight, which I carefully strain before using. I also find that a small portion of engine oil in the mixture assists in a decided manner in obtaining complete vaporisation. This, I am well aware, is often used



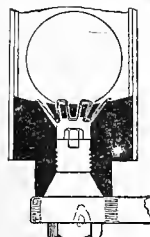
An extra air device.

on overworked sidecar machines (mainly singles), but I have not yet seen anyone mention it as an aid to paraffin consumption.

My mount is a 6 h.p. Zenith, direct drive (76 x 8 J.A.P.), fitted with Amac carburetter, jet 29. Of course, all sorts of jets have been tried, but I find anything larger than the above tends to overheating. As a preventive of this, and also an aid to lubrication, I run with only one piston ring in the front cylinder and two in the back, and find no loss of power, whilst the pistons being well drilled (three rows in each piston,  $\frac{1}{2}$  in. holes), I am able to keep up a good average speed without any of the drying up I previously experienced when the machine was driven at all hard.

I am indebted to an article you recently printed by Mr. J. W. G. Brooker, who quoted a tip used on his Rover, which I have found beneficial in another form. This was to insert pins in the previously enlarged holes over the jet (Amacs only). I had not the means available for accurately enlarging the holes, as recommended, but instead passed a short length of wire in and out of the holes, as shown in the lower sketch. (A single strand of an old Bowden cable is ideal.)

I next tapped a small hole in the inlet pipe, into which I inserted a small gas tap about 1½ in. long. On to this



Splitting up the fuel.

I fastened a small toy trumpet, and bent it downwards to the back of the front cylinder. The tap is kept closed for starting, but once warmed up can be left open permanently, and is particularly useful as an air brake when coasting downhill with the throttle shut. I have fitted copper gauze over each of the inlet ports, my object in fitting it there instead of the more usual fitting close to the carburetter being to catch any particles of foreign matter which may get through the hot air tap referred to.

Knocking was very easily brought about immediately paraffin in any quantity was used, so I re-timed the magneto, giving only a very small lead (about 5 mm.), but find that there is no decrease in speed, and the power on hills has increased enormously, although the previous timing was quite satisfactory for pure petrol.

My consumption is 60-63 m.p.g.—not remarkable, I agree, but very satisfactory in view of the cost of the fuel used,

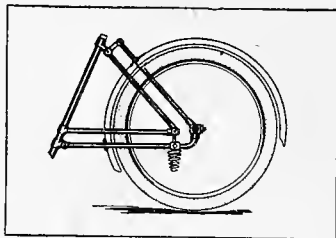
and it could be increased considerably if I were content with low average speeds, which I am not. This is a point which I think should always be borne in mind when calculating m.p.g. I have, on pure petrol, with the help of the above fittings, driven 38½ miles with sidecar and passenger on a measured half-gallon—77 m.p.g.—which, I think, is exceptional.

In conclusion, I would add that I decarbonised at the end of 1,470 miles (average usual distance when using petrol), and found the deposit of the same consistency as when using petrol, the quantity also not being excessive. I have proved to my own satisfaction that the use of petrol-paraffin mixtures is quite possible, if a little trouble be taken. The inlet pipe is covered with thick felt, and afterwards well wrapped with insulating tape. CP 450.

#### Spring Frame Design.

Sir,—I have followed with interest your remarks on sprung frames, and enclose a design I am thinking of fitting to my machine which may interest you.

R.J.B.



Another spring frame design. (See letter from R. J. B.)

#### Repairing Overalls.

Sir,—In reply to your correspondent "Magister," I should recommend him to obtain some prepared canvas, as used for mending the inside of cycle tyres. If it is used in the same way as he would use it on a tyre, he should have no difficulty in mending his overalls. I have such a patch which has stood good for over twelve months.

W. DICKINSON.

#### Four-cylinder Motor Cycles.

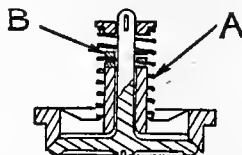
Sir,—As one who has studied the 5-6 h.p. F.N. motor bicycle rather closely, may I give the following hints re tuning. There is no doubt that this machine is capable of wonderful results, in connection with which my machine has the following to its credit:

- (1.) Starts at a walk.
- (2.) Speeds up to 65 m.p.h.
- (3.) Petrol consumption less than a gallon per 100 miles on straight runs.
- (4.) Fierce acceleration.
- (5.) Practically vibrationless at all speeds.
- (6.) Wonderfully steady on grease.

It was evident from the first that the chief causes of trouble were the automatic inlet valves and the automatic (?) carburetter. Automatic inlet valves are very bad practice in a "four," since if one valve sticks it is sure to cause the cylinder affected to fire back into the carburetter and upset all the other cylinders. To obtain perfect results it is therefore necessary to see that the valves work perfectly freely and do not get choked with burnt oil. By bevelling the top edges of the pistons it was found that the tendency to get oil into the inlet valves was almost entirely removed. In order to get the inlet valves to operate freely at all speeds these were lightened somewhat and fitted with double springs. The way in which this was done is illustrated in the sketch. The lighter spring A had a strength of about 1 lb. for an opening of about ⅜ in. At this point the collet engages with the second spring B, which compresses a further ⅜ in. under a force of about 10 lb. This scheme enabled the valves to open freely at low speeds, and at the same time permitted high speeds to be obtained. It also practically eliminated wear on the cotters and their slots.

These modifications enable me to be sure that the inlets always function correctly, and the springs last indefinitely. No doubt mechanical inlet valves would enable more power to be obtained, particularly at low engine speeds, but apart from this I doubt if these could be of much advantage.

It is hard to understand how the F.N. Co. has continued the use of its automatic carburetter for so long. The idea



is very pretty on paper, but in actual practice the mixture is often much too strong or too weak. If the engine ran at constant speed it might be possible to arrange the choke tube variation just to compensate for the varying volumetric velocity of the air intake due to opening or closing of the throttle. As the engine does not run at constant speed one gets an over rich mixture when running fast down hill on a small throttle opening, also a very weak one when climbing slowly with a wide open throttle. Again, when accelerating, the choke tube is enlarged before the machine has gathered speed, so that the mixture is too weak, and when closing down the petrol is sucked wastefully out of the jet by reason of the choke tube being reduced before the machine has slowed down. In addition to the above, the necessary adjustment of the range of the choke tube area to suit various weather conditions is largely a matter of guessing and by no means easy to carry out. Finally, the design of the variable choke tube is far from perfect even for one engine speed. The fitting of an extra air port above the throttle is obviously a makeshift improvement, and at once disposes of single-lever control.

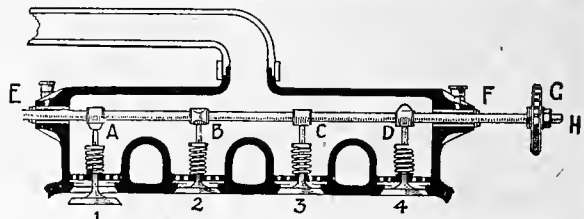
In view of these facts, I decided to make a double lever arrangement for controlling the choke tube and throttle independently. This was done by carrying the choke tube pinion on a hollow spindle and passing the throttle spindle through this. A remarkable improvement resulted. Whereas previously the mileage per gallon has been variable from 50 to 70, it immediately rose to at least 100. Acceleration was immensely improved, and the engine kept wonderfully free from carbon deposit. A curious fact is that, except for hill-climbing and wide changes of speed, it is found inadvisable to vary the choke tube at all, and I generally give the engine the weakest possible mixture consistent with regular firing.

In connection with the bevelling of the pistons, it was found desirable to restore the original compression ratio. This was done by taking about ⅜ in. off the bosses where the sparking plugs are fitted.

Once one understands a four-cylinder machine properly one loses interest in singles and twins. The obvious defects of snatchy drive and bad balance, which are generally found in these engines, ought to have condemned them years ago. They are even less suitable for use on cycles than on big cars, where, of course, they are now obsolete.

When will some enterprising firm build a motor bicycle with an aero type engine with four, six, or eight cylinders? It would be welcomed by L.M.

Sir,—I am sorry to say that I am more than disappointed with Mr. Thompson's reply to my request for particulars of his mechanical inlet valve arrangement for an F.N. motor.



SUGGESTED MECHANICAL VALVE ATTACHMENT FOR A FOUR-CYLINDER F.N.

The shaft H is carried in bearings E and F, cast in the induction manifold, and driven by a chain on the sprocket G. The cams A B C D are fixed to this shaft. (See letter from Freeman Lee.)

In my previous letter I did not ask for a complete treatise on tuning up my machine, for mine gives entire satisfaction as it is, excepting that for its c.c. of 498 I find that the bottom gear ratio of 7 to 1 for hilly districts is too high. If this one point were remedied so that it conformed to most low gear ratios of British machines of the same capacity, I fail to see where the advantages of mechanical valves would be with their extra complications.

At the same time I do feel that, if fitted with a mechanical valve arrangement as per sketch, it would be possible to make the F.N. engine of 498 c.c. equal to probably a 650 c.c. British engine in efficiency. This latter point, however, is for makers to develop, not riders, so at the moment I am content in lowering my gear.

FREEMAN LEE.

**An Inadmissible Theory.**

Sir,—In reference to a letter from "Ignoramus," published in your issue of June 1st, I beg to make a few observations. He asks for the opinions of others on his "theory," but I think he would have done better to have enquired a little more fully, privately.

In his expression, "The expanding charge, seeking the path of least resistance, commences to flow out of the cylinder, being assisted by the compression within," one is glad to notice that the "compression within" does at least get some credit for the expulsion of the charge. He goes on to state that the burnt gases, in virtue of their greater density compared with the incoming mixture, will tend to sink to the bottom; but why does he rush to the conclusion that "the burnt gases retained in the cylinder should be of a negligible quantity," especially as the whole transfer of the gases takes place in a fraction of a second? As a matter of fact, the burnt gases are lighter than the unburnt, therefore, if the reasoning of "Ignoramus" is correct, the burnt gases should float to the top of the cylinder, tending to let the incoming mixture escape out of the exhaust port.

It appears that "Ignoramus" made a mistake to start with, then built up a pretty but false theory, believing it himself and throwing it in the limelight for other people to believe.

I.E.F., France.

M.H.O.W., D.R.

**The Taxation of Motor Cycles.**

Sir,—I have been much surprised at the attitude taken up by motor cyclists with regard to the new taxation. Surely motor cyclists are no less loyal than other people, yet one would think so from the tone of the letters published recently in *The Motor Cycle*. I have been a keen motor cyclist for years, and so am not prejudiced. Owing to having lost a leg in this war I have had to give up the pastime, but such a hold had it taken on me that, after much deliberation, I bought a small car. I consider that my claim to possess a motor is as strong as any put forward in these letters, yet I intend to pay my double tax quite cheerfully, as I consider that we at home should willingly pay whatever is asked of us as a price for the safety we enjoy from the sacrifices of others.

A man who sells his outfit because of an extra £2 a year is "cutting off his nose to spite his face." As for the "contract" between owner and the State, by which licences last till December 31st, 1916, how about income tax and other forms of taxation? Did not an increase take place in the middle of a financial year? We are at war.

In an emergency of this sort there can be no such contracts. The money must be raised, and motorists must pay more than the non-motorist, for few, if any, motors are not used for pleasure. Everyone at home ought to be willing to make any sacrifice for those at the Front. And one more point. Do not grouse too soon—there is heavier taxation to come.

ONE WHO HAS BEEN OUT.

**Enclosed or Open Chains.**

Sir,—We have no hesitation in stating that considerable harm can be occasioned to a chain by boiling it in grease.

The temper of steel can be drawn until the polished surface of such steel attains quite a brown colour at a temperature of approximately 490° Fahr., and most greases can be brought to a temperature in excess of this without boiling.

We consider that the maximum temperature to which grease should be brought when used in connection with chain lubrication should be 300° Fahr., but we have to state that we see no reason for bringing the grease up to such a temperature. In our own plant our grease vats are heated by steam, so that their temperature is never much above 200° Fahr. This is a sufficient temperature, however, to ensure that the grease is melted sufficiently to enable it to penetrate the joints of even the smallest chains we make.

The usual recommendation we make to our clients for greasing chains is to obtain a shallow tin containing thick grease or lubricant of a depth that will ensure the chain being covered when immersed. The chain should then be coiled up so as to occupy a small space, and should be laid on top of the grease, after which heat, in the form of a gas ring or lamp, may be put underneath the tin. When the grease liquefies the chain will become immersed, and

being warm will not prevent, due to local solidification, the grease from entering the joints. Within two or three minutes after the lubricant has melted, the heating device may be extinguished, after which the chain should be allowed to remain in the lubricant until this has again solidified. The chain should afterwards be removed, and all superfluous grease on the outside of the chain can be removed with a brush or wiper.

In conclusion, we may say that to ensure the joints of the chain being satisfactorily lubricated by this process it is always advisable thoroughly to clean the chain in a paraffin bath before immersing in the lubricant bath.

THE COVENTRY CHAIN CO., LTD.

H. W. WATTS, General Manager.

**Touch Wood!**

Sir,—Your correspondent who signs himself "S.L." asks if any reader can beat his narrow escape from a serious accident. I think he will agree that the following incident, the truth of which can be vouched for by the other two officers concerned, would have given him even more cause to be thankful that he was still alive. Anyone who is acquainted with Chatham will know Cemetery Hill, which comes down steeply from Maidstone into Railway Road. A single line of trams runs on the right-hand side of the road as one is going down the hill, with a passing place about half way down the hill. I was coming down this hill on a very greasy day on a 5-6 h.p. Indian, with one officer in the sidecar, and another on the carrier. Being in a hurry to get in before lighting-up time, we were doing just over forty, and were overtaking a tram on the left-hand side. We were about thirty yards behind it when it swung in to the left at the passing place, the existence of which I had forgotten. There was a little under three feet between the side of the tram and the kerbstone—in this place nearly a foot high. It was no use swerving or putting on brakes, as the road was so greasy that in either case we should have hit the back of the tram, so I just let drive for the opening. We all leaned in to see what part of the tram we should hit, with the result that the sidecar wheel came right off the ground and cleared the kerb without touching it, and we got through without any casualty, beyond barking my knuckles against the tram. But I do not think that any of us would care to repeat the experiment!

MILITARY CYCLIST.

**Two-stroke Balance.**

Sir,—In your articles on "The Mechanics of Balancing," I find the statement (issue of May 25th, page 486): "From the point of view of balancing, a two-stroke engine is on exactly the same footing as a four-stroke, other conditions being equal."

In *The Automobile Engineer* for December last, page 344, it is said: "It is quite clear that, with the aim of retaining the full advantage of the more even torque of which the two-stroke engine is capable, the designer is confronted with the problem of balance, which does not in any case equal that of the four-cylinder or six-cylinder four-stroke engine, and, so far as the ordinary type of two-stroke engine is concerned, this disadvantage cannot be overcome."

Would it be possible to get your contributor to explain? TYRO EAGER TO LEARN.

[Our contributor's statement is quite correct; so also is the statement made in *The Automobile Engineer*. Other conditions being equal, the balance of a two-stroke or four-stroke is identical, but, with the aim of retaining the full advantage of the more even torque, the balance is sacrificed in a four or six-cylinder engine. For example, in a four-cylinder four-stroke engine four explosions occur in every two revolutions, or one explosion every 180°; the cranks are therefore set at 180°, and balance each other. In the case of a two-stroke four explosions occur in one revolution, or at intervals of 90°. Thus to retain the even torque the cranks must be set at 90°, in which position they do not balance each other. This must not be confused with the 90° V twin, in which the balance is excellent. If a two-stroke four-cylinder engine were made in the same form as a four-stroke, two explosions would occur simultaneously, and the torque would be less constant.—Ed.]





#### A New Address.

The M.L. Magneto Syndicate, Ltd., is now situated at Victoria Works, West Orchard, Coventry.

#### A Novel Head Protector.

In illustrating on page 546 of our last issue a head protector that is worn inside the ordinary cap, we omitted to state where it could be obtained. It is being sold by the Service Co., Ltd., 289, High Holborn, W.C.

#### A Wolf Mascot.

The Wulfruna Engineering Co., Ltd., Great Brick-kiln Street, Wolverhampton, has recently introduced a mascot in the shape of a wolf, designed to be attached to the handle-bars of Wolf motor cycles.

#### Injectors for the Government.

Messrs. Arthur Price, Vevo Works, Park Lane, Aston, Birmingham, inform us that they are supplying the Government with a large quantity of their three-spout injectors.

#### A Visitor from New Zealand.

We are informed that Mr. J. B. Clarkson, the well-known motor trader of New Zealand, has started on his annual pilgrimage to the old country, and that he is expected to arrive at the beginning of July. His address will be c/o Keep Brothers, Ltd., 35, Great Charles Street, Birmingham.

#### Hiring Motor Bicycles.

We are constantly asked by readers who are anxious to hire motor bicycles or motor bicycles and sidecars of a firm who let out machines on hire. Maude's Motor Mart, 100 and 106, Great Portland Street, W, inform us that they make a speciality of this kind of business.

#### Catalogues Received.

We are in receipt of a folder issued by Charles Edmund and Co., Crane Bank, Chester, describing in detail the Edmund spring frame.

We have received a folder from the Midland Rubber Co., Ltd., Ryland Street, Birmingham, dealing with their latest pattern tyres and belts, all types of which are illustrated and described.

The Bowden Brake Co., Tyseley, Birmingham, have sent us a copy of their latest catalogue, which is an excellently arranged and beautifully got up production. The motor cycle section contains all particulars of Bowden brakes, cables, control levers, etc.

The Alldays-Allon two-stroke motor cycle. Alldays and Onions Pneumatic Engineering Co., Ltd., Birmingham. The latest catalogue of the Allon two-stroke is a very fine publication. Interesting features, such as the Allon mud shields, spring forks, chain guard, gear box, and details of the new twin-cylinder two-stroke machine, are illustrated.

Fitsu Sidecars. We have received a copy of the 1916 catalogue from Fitsu Sidecars, Scala House, Smallbrook Street, Birmingham. The point of interest about these sidecars is that all models—and all tastes are catered for—are anatomically shaped to the passenger; this, it is claimed, gives a natural sitting position of great comfort.

The latest catalogue of the Levis two-stroke, Butterfields, Ltd., Stechford, Birmingham. Herein we find the popular Levis two-stroke illustrated and described. One of the excellent features of this catalogue is the series of mechanical drawings.

We also have to acknowledge the receipt of a Levis spare parts list. This again contains instructive illustrations of the management of the Levis. A particularly useful sketch shows the method of replacing the gudgeon pin, showing which side of the pin should be hit. We also are in receipt of a pamphlet entitled "Driving Instructions."

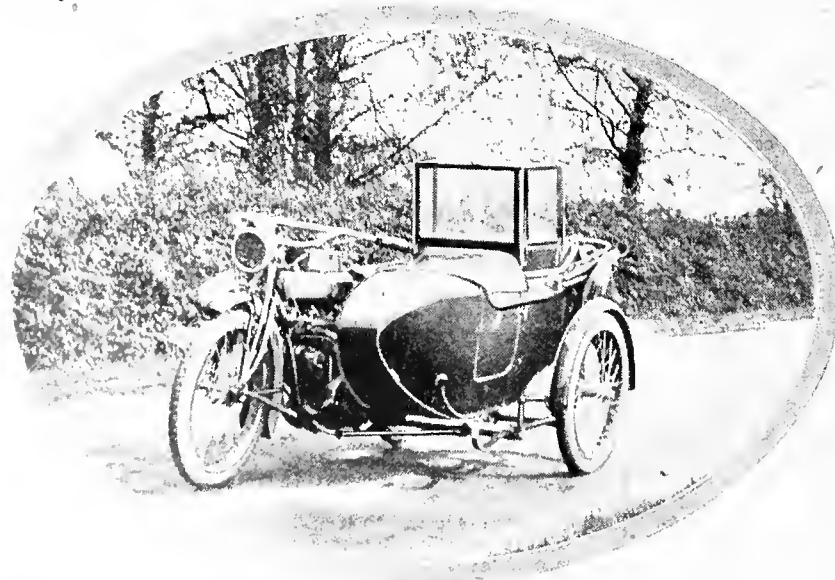
### Average Prices

OF

### Second-hand Machines.

From "The Motor Cycle" of June 8th.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S.	1915	6 3-sp. sidecar	—	£83
"	1914	6 3-sp. sidecar	£63	—
"	1913	6 3-sp. sidecar	—	£63
"	1915	2 3-speed	—	£47
Allon	1916	2 2-stroke	—	£39
"	1915	2 2-stroke	£29	—
Bat	1915	8 3-sp. sidecar	—	£70
Bradbury	1914	6 3-sp. sidecar	—	£48
"	1914	4 sidecar	£37	—
B.S.A.	1916	4 3 speed	—	£37
"	1915	4 3-sp. sidecar	£64	—
"	1915	4 3-speed	—	£46
"	1914	4 3-sp. sidecar	—	£49
"	1914	4 3-speed	—	£43
Calthorpe	1915	2 2-speed	—	£27
"	1914	2 2-speed	£12	—
Campion	1915	2 2-stroke	—	£21
"	1914	6 sidecar	—	£51
Clyno	1914	6 3-sp. sidecar	—	£48
Douglas	1915	2 3-speed	—	£45
"	1915	2 2-speed	—	£46
"	1915	2 T.T.	£45	—
"	1915	4 3-sp. sidecar	—	£66
"	1915	4 3-speed	£55	—
"	1914	2 2-speed	£36	—
"	1914	2 2-speed T.T.	—	£37
"	1913	2 2-speed	£30	—
"	1913	2 T.T.	£31	—
Enfield	1916	6 2-sp. sidecar	—	£87
"	1915	8 2-sp. sidecar	—	£74
"	1915	6 2-sp. sidecar	£67	—
"	1914	6 2-sp. sidecar	—	£6
"	1915	3 2-speed	—	£42
"	1915	3 2-speed	—	£34
Excelsior (A)	1915	7 3-speed	—	£50
H.-Davidson	1915	7-9 3-sp. sidecar	£79	—
"	1915	4 2-speed	—	£44
Hobart	1915	2 2-stroke	—	£23
Hummer	1913	3 2-sp. sidecar	—	£26
"	1912	3 2-sp. sidecar	£30	—
Indian	1915	7 3-sp. sidecar	£80	—
"	1915	5 3-sp. sidecar	—	£60
"	1915	5 3-speed	—	£54
"	1915	3 3-speed	—	£49
"	1915	Powerplus sidecar	£96	—
"	1914	7 2-sp. sidecar	—	£57
"	1914	7 2-speed	—	£42
"	1914	T.T.	—	£36
James	1915	4 3-speed	—	£56
"	1915	2 2-sp. 2-stroke	—	£25
"	1914	4 3-sp. sidecar	—	£44
"	1915	Popular	£46	—
Levis	1915	Popular	£23	—
"	1914	2-speed	—	£22
Matchless	1915	8 3-sp. sidecar	—	£78
"	1914	8 3-sp. sidecar	—	£77
"	1913	8 3-sp. sidecar	£59	—
Motosacoche	1913	2 2-speed	—	£27
New Hudson	1915	2 2-speed	£30	—
"	1914	6 3-sp. sidecar	—	£44
New Imperial	1916	2 2-speed	—	£34
"	1915	2 2-speed	—	£27
New Ryder	1915	2-speed	—	£27
O.K.	1915	2 speed	—	£25
P. & M.	1914	3 2-sp. sidecar	—	£37
"	1913	3 2-sp. sidecar	—	£37
Premier	1914	3 3-speed	—	£20
"	1914	3 3-sp. sidecar	—	£46
Rex	1914	6 2-sp. sidecar	£48	—
"	1913	6 2-sp. sidecar	£32	—
Rover	1915	3 3-sp. sidecar	—	£50
"	1914	3 3-sp. sidecar	—	£42
"	1915	3 T.T.	—	£43
"	1914	3 3-speed	£38	—
Royal Ruby	1915	2 2-stroke	—	£27
Rudge	1914	3 3 Multi sidecar	—	£44
"	1914	3 Multi	—	£37
"	1914	5-6 Multi sidecar	—	£40
Scott	1915	3 2-sp. sidecar	—	£50
"	1914	3 2-sp. sidecar	—	£48
"	1914	3 2-speed	£38	—
"	1913	3 2-sp. sidecar	—	£34
Sunbeam	1915	3 3-speed	—	£60
"	1914	6 3-sp. sidecar	—	£79
Triumph	1915	2 2-sp. 2-stroke	£36	—
"	1914	4 3-speed	—	£38
"	1914	4 3-sp. sidecar	£50	—
"	1913	3 3-speed	—	£33
"	1913	3 3-sp. sidecar	£42	—
Williamson	1914	8 2-sp. sidecar	£58	—
Zenith	1914	6 Gradua sidecar	—	£48
"	1913	8 Gradua sidecar	—	£36
"	1913	6 Gradua sidecar	—	£52



A Powerplus Indian passenger outfit. Note the Dunhill windscreen, a feature of which is the side flaps.

## MOTOR CYCLES FOR SALE.

## Auto-Wheels.

**A**UTO-WHEEL, good condition: £7, or offer.—Palmer, 138, Church Rd., Battersea. [6748]

**A**UTO-WHEEL and Humber bicycle, in good condition: £12.—Crump, Farringdon, Alton, Hants. [X1688]

**A**UTO-WHEEL, late 1915, perfect order, ridden 400 miles; 8 gns., or nearest.—F.C.—3, Grafton St., Piccadilly. [X1890]

**W**ALL Auto-Wheel, 1914, little used, single lever control; cost £14/14, bargain, £8/10.—Belwell Bros., Yeovil. [X1747]

**W**ALL Auto-Wheel, 1914, latest, single lever control, used very little; equals new: £8/10, bargain.—Murray, 37a, Charles St., Hutton Garden, Holborn. [X1805]

**A**UTO-WHEEL, 1914, in first-rate order; expert examination invited: 10 gns. with bicycle attached, £8 alone, or close offer.—Write, Lady Ellen Lambart, Moncrihill, Rickmansworth. 6650

## Bat.

**19**12 3½ h.p. Bat-Jap, mag., B. and B. spring frame, tyres, belt good: £14.—Blake, 218, Westbourne Grove. [6873]

**B**AT-J.A.P., 1912, requires re-bushing: £23; owner on active service; no offers.—Garle, Chipstead, Surrey. [6881]

**B**AT, just delivered, latest 4.5-h.p. sporting model, with 2-speed countershaft; £63/5.—P. J. Evans, John Bright St., Birmingham. [X1819]

**7**-h.p. Bat, 2-cyl., spring frame, chain drive, perfect and faultless condition throughout; list £75, price £50.—Henry Pullan, Cirencester. [6710]

**B**AT-J.A.P., 1913, 6 h.p., 2-speed, chain drive, spring frame, Gloria 16/16 spring wheel sidecar, tyres new, F.R.S., perfect condition; £39, or exchange solo mount.—89, Oak Lane, Bradford. [X1764]

**B**AT Cycle, 6 h.p., twin cys., special model No. 2 C., 1915 model, painted grey, Bosch ignition, countershaft gear, with 3 speeds, complete with Lucas head and tail lamps, tyres 26x2½, spring footboard, Lucas horn, spare box, bolts, and nuts, also spare chain parts, tools, pump.—Can be seen at Barkston Motor Co., 244, Earl's Court Rd., London, S.W. Price asked £75. [5998]

## Blackburne.

**B**LACKBURNE, 3½ h.p., late 1915, 3-speed Sturmey-Archer countershaft gear, condition new, little used, new spare Dunlop cover and Avon tube, tyres good, tools complete, several spares, Lucas horn, etc.; best offer over 50 gns.—Lt. Smith, Whitehart Barnacks, Portsmouth. [6829]

## Bradbury.

**19**12 Bradbury, with Lloyds 2-speed gear; £25.—Parker and Sons, St. Ives, Hunts. [6904]

**19**14 Bradbury, 4 h.p., dropped frame, as new, for big twin.—61, Park Side, Coventry. [X1934]

**B**RADBURY, 2½ h.p., perfect condition; to clear £8/10.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [6717]

**B**RADBURY and Sidecar, 4 h.p., 3-speed, clutch, excellent order and condition; £35.—Dunn, Sunningdale, Berks. [6849]

**B**RADBURY, 1913-1914, 4 h.p., 3-speed, pedal start, cigar shape coachbuilt sidecar; £35, bargain.—29, St. Leonard's St., Bow. [6866]

**B**RADBURY, 4 h.p., 1915 piston and cylinder, engine re-bushed, B.B., Bosch, good condition; bargain, £17/10.—Anderson, 204, Blackhorse Lane, Walthamstow. [6695]

## Brough.

**B**ROUGH, 1915 T.T. twin, countershaft 2-speed, perfect condition, Lucas horn, P. and H. lamp set, Watford maximum speedometer; £50, offers.—James, Cumnor Hill, Oxford. [6859]

## Brown.

**B**BROWN, 3 h.p., B. and B., Mahon, free engine, lamp, horn, etc.; £8.—Box 551, c/o The Motor Cycle. [X1857]

**19**13 3½ h.p. Brown, mag., adjustable tappets, perfect condition; bargain, £16.—Blake, 218, Westbourne Grove. [6874]

**B**BROWN, 3½ h.p., and sidecar, 2-speed, in good order; £25; easy payments arranged.—Jones, Garage, Broadway, Muswell Hill. [6239]

**B**BROWN, 3½ h.p., B.B., Chater frame, wants accumulator and cleaning; £5/10, offers.—Rifle Range, Newington Butts, Elephant, S.E. [X1762]

**3**½ h.p. Brown, coachbuilt sidecar, 2-speed, condition and appearance as new: £34, or exchange higher power.—S.T., 13, Kitchener Rd., Forest Gate, E. [6658]

**B**BROWN, 3½ h.p., absolutely perfect condition, lamps, horn, fully equipped, like new: bargain, £27.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [6718]

## B.S.A.

**19**16 B.S.A. ready for delivery.—Parker and Son, St. Ives, Hunts. [6902]

**B**.S.A., new 1916 models H and K in stock, no waiting.—Moss, Wem. [X1925]

**C**OLMORE Depot, 261, Deansgate, Manchester, for immediate delivery of B.S.A. [0798]

## CORONET SIDECARS.

We are building special models for Harley-Davidsons, Excelsiors, and Indians, enamelled either grey or red to match machines, and fitted with 28x3 in. tyre and four point attachment.



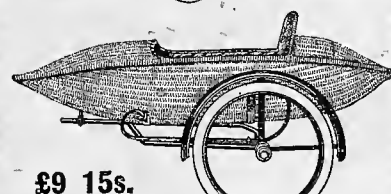
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11, electrically equipped, 3 speed ..... £76 13  
11F, standard 3 speed model ..... £68 5

Cash Offers Wanted.

## CASH OFFERS WANTED.

7-9 h.p. INDIAN, 1915, 3-speed electrical model, and £18 Montgomery Sidecar ..... £69 15

1916 7-9 h.p. HARLEY-DAVIDSON ..... £80 15

1916 ditto electrical model ..... £89 0

7-9 h.p. INDIAN, 1915, electric model, with Millford £18 18s. Sidecar, screen ..... £75 0

8 h.p. ZENITH, 1913, 2-cyl. side gear ..... £29 15

2½ h.p. WOLF, 1916, 2-stroke, 2-speed ..... £33 10

A.C. Sociable, 1912, hood, screen, 3 brass lamps ..... £39 15

6 h.p. REX, 1912, 2-speed model ..... £25 0

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3½ h.p. TRIUMPH, 1910 model ..... £18 15

3½ h.p. LINCOLN-ELK, 1912 model ..... £14 15

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1913 HUMBERETTE, 8 h.p., hood, screen, 5 lamps, and speed wants attention ..... £39 0

4 h.p. NEW HUDSON, 1913, 3-speed model, with £13 coach Sidecar ..... £55 15

3½ h.p. P. & M., 1909, 2-speed, chain drive, with Sidecar ..... £19 15

1½ h.p. WOLF Lightweight, 1912, magneto ..... £6 15

2½ h.p. Machine with P. & M. engine ..... £2 15

3 h.p. LINCOLN-ELK, 1911, magneto ..... £12 15

3½ h.p. TRIUMPH, 1911, 2-speed model, with Sidecar, lamps, and horn ..... £23 15

2½ h.p. PREMIER, 1912, 3-speed model ..... £20 15

7-9 h.p. HARLEY-DAVIDSON, electrically equipped, complete with sidecar ..... £69 15

3½ h.p. HUMBER, 1911, 2 speed ..... £17 15

3½ h.p. P. & M., 1909, 2-speed model ..... £16 15

1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn and lamps ..... £79 0

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New £5 Weatherproof Magneto; £3 10s. B. & B. Carburettor; 12/6. Amac Carburettor; 12/6. Good complete Sidecar; 32/6. Burybury £13 Coach Sidecar; £5 5s. Coach Cane Sidecar; £3 10s. Wicker Sidecar, enclosed body; 42/6. Sidecar Chassis, with tyre; 27/6. Speedwell £14 Coach Sidecar, with screen; £7 10s. Lightweight Coach Sidecar, new; £7 15s. Nearly New Douglas Carburettor. New Coach Sidecar Body; £3 5s. New English Horos, listed at 18/6; 12/6. New Sidecar Chassis, complete with all fittings; 65/-. 1916 Binks Carburettors; your old carburettor taken in exchange.

WANTED to buy 2 FORD CARS, bodywork unimportant.

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HALIFAX.

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## MOTOR CYCLES FOR SALE.

## B.S.A.

**B**.S.A., all models, and sidecars in stock at Colmore Depot, 44, Finsbury Pavement. [6532]

**B**.S.A. Models H and K in stock; immediate delivery.—Colmore Depot, 261, Deansgate, Manchester. [6024]

**B**.S.A.—Immediate deliveries from stock of model H machines, £64.—Grosvenor Garage, Bradford St., West, Bolton. [X0886]

**19**15 B.S.A. Combination, chain drive, 3-speed countershaft; £55.—Milton, Netherwood, Epsom Rd., Guildford. [6899]

**B**.S.A. Models H and K actually in stock; first cheque secures.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [6745]

**B**.S.A., 1915, model K, 4 h.p., 3-speed, chain-cum-belt, one of the hard-to-get machine; £45, bargain.—Layton's Garage, Bicester, Oxon. [X1865]

**B**.S.A., 1915 model K, 3-speed, in good condition, extra well tyred, carefully overhauled, lamp, horn, privately owned.—Tollady, Bicester, Oxon. [X1868]

**B**.S.A., late 1915, and sidecar, wind screen, lamp set, etc., everything perfect; £64; seen by appointment.—Blackman, 4, Sandhurst Market, Catford, S.E. [6784]

**19**15 B.S.A. 3-speed, chain-cum-belt, and Mills-Fulford sidecar, and accessories, in perfect condition; seen any time; £54.—223, High Rd., Kilburn. [6675]

**19**13 B.S.A., 3½ h.p., clutch model, excellent condition; £28; pay cash for thoroughly reliable combination.—Newham, 223, Hammersmith Rd., W. [6817]

**B**.S.A., 1914, 3-speed countershaft, kick start: B.S.A., spring sidecar, Lucas lamps, horn, speedometer, various spares, new tyres; £50 cash, no offers.—71, Hymers Av., Hull. [X1693]

**B**.S.A., 1915, model K, electric lighting set, Canoelet sidecar, luggage carrier, storm apron, all accessories, perfect, 2,200 miles; £65; any trial.—H. 41, Dagnar Av., Wembley Hill, Middlesex. [X1766]

**B**.S.A., 1914, 4½ h.p. model, fitted with countershaft 3-speed gear and kick starter, handsome coachbuilt sidecar; the complete turnout, fitted with accessories. £57/10.—Wanchope's, 9, Suco Lane, London. [6774]

**B**.S.A., brand new, 1916 model H, with new Lucas horn, 1. and H. lamps, costing £68, practically new Gloria Projectile sidecar costing £30; bought car; what offers?—Veitch, 114, Askew Rd., Shepherd's Bush. [6931]

## Calthorpe.

**C**ALTHORPE-J.A.P., brand new, 2½ h.p., 2-speed model, £35.—Moss, Wem. [X1926]

**C**OLMORE, 44, Finsbury Pavement, have all models Calthorpe in stock; shop-soiled 2-stroke, £24/10. [6531]

**2**-SPEED Calthorpe Junior, perfect order; £13/10; approval.—Curd, 17, Gardner St., Brighton. [6884]

**C**ALTHORPE-J.A.P., 2½ h.p., 1915, 2-speed Enfield, as new; £22.—Norfolk Villa, Joseph's Rd., Guildford. [6735]

**C**ALTHORPE Junior, 1914, 2 speeds, 2½ h.p.; £12; good condition.—Write first, 1, Campbell Rd., Croydon. [0812]

**C**ALTHORPE, June 1915, 2-stroke, 2-speed, all accessories; £24.—Longman, 4, Ruvigny Gardens, Putney. [6641]

**19**15 Calthorpe-Jap, Enfield 2 speeds and free engine, all accessories, 2½ h.p.; accept 24 gns.—50, Talbot St., Burnley. [X1847]

**C**ALTHORPE Junior, 1914, 2-speed, good order, 15 gns.; waterproof overalls, 12/6.—Cockburn, Jonsdane, Flower Lane, Mill Hill, N.W. [6757]

**C**OLMORE Depot, 51, Colmore Row, Birmingham, have in stock all models of Calthorpes for immediate delivery; also at our Manchester Depot. [0799]

**C**ALTHORPE, 2-stroke, 1916, latest model, Enfield 2-speed gear, just arrived from works; £32/11.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6668]

**C**ALTHORPE, 2½ h.p. J.A.P., with Enfield 2-speed gear, brand new, shop-soiled only; list £36/15, accept £35.—P. J. Evans, John Bright St., Birmingham. [X1818]

**C**ALTHORPE-J.A.P., 1916, latest model, 2½ h.p., Enfield 2-speed gear, just arrived from works; £37/16.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6667]

**C**ALTHORPE Motor Cycles, 1916 models.—Just arrived: 2-stroke 2-speed 31 gns., J.A.P. 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storey's, 118, Gt. Portland St., W. [0777]

**C**ALTHORPE-J.A.P.'s and 2-strokes; immediate delivery from stock of all models; cash or exchange.—Colmore the Agents, Calthorpe the motor cycle, 261, Deansgate, Manchester. [0815]

**C**ALTHORPE-J.A.P.'s, with Enfield gears, actually in stock; £37/16; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [6739]

**L**ATE 1914 Calthorpe Junior, 2 speeds, free engine, just been thoroughly overhauled, new tyre, belt, etc., first-class condition; trial here: £15/10, or near offer for quick sale.—Broadley, Munday Bois, Egerton, Kent. [X1745]

# DELIVERY EX ACTUAL STOCK

(not expected, but actually  
on the premises at time  
of going to press).

## ALL 1916.

Harley-Davidson	7 h.p., 16 F, 3-speed .....	£80 15
Harley-Davidson	7 h.p., 16 J, electric equip ..	£89 5
Harley-Davidson	Sidcar de Luxe for either .....	£21 0
Indian "B"	5 h.p., semi T.T. bars .....	£70 0
* Indian "B"	5 h.p., 3-speed, and Sidcar .....	£86 16
* Indian "F"	7 h.p. Powerplus, 3-speed ..	£83 0
* Indian "F"	and Sidcar .. ditto, electric equipment .....	£104 0
* Indian	6 h.p., 2-speed Combination ..	£89 5
* Enfield	4 h.p., 2-speed Combination ..	£60 7
* Calthorpe	2½ h.p., 2-speed 2-stroke .....	£42 0
Allon	2½ h.p., single-sp., 2-stroke ..	£36 0
Allon	2½ h.p., 2-speed and clutch .....	£45 0
Royal Ruby	2½ h.p., 2-stroke 3-speed .....	£29 10
Royal Ruby	2½ h.p., 2-stroke 2-speed .....	£36 10
Royal Ruby	2½ h.p. J.A.P., ladies' model ..	£46 10
Royal Ruby	2½ h.p. J.A.P., 2-speed .....	£42 0
Sun Villiers	2½ h.p., 2-stroke 3-speed .....	£29 10
Sun Villiers	2½ h.p., 2-stroke 2-speed .....	£36 0
Sun V.T.S.	2½ h.p., 2-stroke 3-speed .....	£30 10
Sun Villiers	2½ h.p., 2-stroke 2-speed de Luxe ..	£37 0
New Ryder	2½ h.p. J.A.P., 2-speed .....	£33 12
Levis	2 h.p. popular 2-stroke .....	£32 0
J.H.	2-spdl., 2-stroke ..	£39 8
Coventry	2-stroke, single-speed ..	£36 15
Eagle	2½ h.p. 2-speed, ladies' model ..	£35 14
Calthorpe	2½ h.p., 2-stroke 2-speed .....	£28 17

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Machines starred (\*) are sidcar combinations.

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### MOTOR CYCLES FOR SALE.

#### Calthorpe.

CALTHORPE latest 1916 2-speed models in stock; cash or exchange; no waiting. Also a few brand new 1915 models, slightly soiled, at reduced prices.—Eagles and Co., High St., Acton. [X1869]

CALTHORPE-J.A.P., 2½ h.p., 1915½, Enfield 2-speed, 20 gns.; also O.K. Junior, 2-speed countershaft, brand new, 20 gns.; owner in H.S., M.G.C.—Wren, 21, Puckington St., Islington. [6749]

1916 4 h.p. Twin Calthorpe-Jap combination, Enfield 2 speeds, free engine, handle starting, chain drive, coachbuilt sidcar unused; owner called up before taking delivery; £65.—30, Talbot St., Burnley. [X1849]

LATE 1915 Calthorpe-Jap, Enfield 2 speeds, electric lighting, 2½ h.p. J.A.P. engine, enamelled Indian red, and fitted with Indian T.T. bars, very fast and sporty looking, as new; cost £45, accept £28/10.—Myrtle Cottage, Ormerod Rd., Burnley. [X1848]

CALTHORPES, new 1916 models, 2½ h.p. J.A.P. engine, 2-speed Enfield gear, £37/16; 2-stroke models, £32; also the sidcar combination, fitted with twin-cyl. 4-5 h.p. J.A.P. engine, 2-speed gear, handsome light coachbuilt sidcar, the combination 67 gns.; exchanges or easy terms arranged.—Wauchope's, 9, Shoe Lane, London. [6777]

#### Campion.

CAMPION-VILLIERS, 2½ h.p., fine little lightweight, engine extra good, a guaranteed machine; £21, or reasonable offer.—Layton's Garage, Bicester, Oxon. [X1864]

#### Centauro.

CENTAUR, 2½ h.p. twin, T.T., 3-speed gear, just overhauled; any trial; £27.—Meeten, Dorking. [6552]

#### Chater-Lea.

8 h.p. Chater-Lea Combination, 2-speed and free, kick-starter, accessories, new tyres and belt; £35.—72, Perry Vale, Forest Hill. [6825]

#### Chater-Lea-Jap.

6 h.p. Chater-Lea-Jap and wicker sidcar, in good running order; £25.—Berryman, King St., Redruth, Cornwall. [X1711]

CHATER-LEA-J.A.P., 4 h.p., B. and B., Simms, T.T. N.S.U. gears; trial any time; £24.—Ambros, Station, Burnham-on-Crouch. [6804]

#### Clyno.

1914½ Clyno, 2-stroke, 2-speed, clutch, Lucas head light, rear light, and horn, good tyres, spare tube, excellent condition; £22.—Peterson, Laurels, Church, Warrington. [X1810]

CLYNO, 2½ h.p., 2-stroke, 2-speed, hand clutch, Dunlop heavy, 2½ in. Lucas lamp set, and horn, latest model, only machine of its type obtainable; £40.—Eldridge, Fordingbridge. [6828]

CLYNO Combination, 1914, 5-6 h.p., 3 speeds, Lucas lighting set, disc wheels, speedometer, mechanical horn, just been thoroughly overhauled, re-plated, and enamelled, looks and runs like new; bargain, £65.—Eice and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [6551]

#### Connaught.

CONNAUGHTS in stock for immediate delivery, miniature, standard, and 2-speed models; prices from £28/17/6.—P. J. Evans, John Bright St., Birmingham. [X1815]

#### Corah.

6 h.p. Corah-Jap, Jardine 4-speed, usual accessories, Turner coachbuilt sidcar, hood, screen; £50.—180, Turner's Hill, Cheshunt, Herts. [6786]

#### Dot.

1916 Dot-Jap, 2½ h.p., 2-speed countershaft, lamp, spares; £35.—101, Woodhouse Lane, Wigan. [X1739]

#### Douglas.

DOUGLAS, 1911, good order; £18, offer.—103, Myddleton Rd., Bowes Park. [6622]

DOUGLAS, T.T., 1915, 2 speeds, perfect order; £30.—Warren's, Warren St., London. [6811]

1915 4 h.p. Douglas, 3-speed, clutch, kick starter; £45 cash.—Smith, 54, Connaught Rd., Cardiff. [X1833]

1909 Douglas, in good order; bargain, new tyres, £12.—Jones, Garage, Broadway, Muswell Hill. [6240]

DOUGLAS, 1915½, 2½ h.p., 2 speeds; any trial; £45, or offer; after 6.—Fleming, 15, Austin Friars, E.C. [6752]

DOUGLAS, 2½ h.p. 2-cyl. lightweight, 1910, excellent order; £15/10.—Kennedy, 215, Selhurst Rd., S. Norwood. [6832]

1911 Douglas, in good order, footboards, nearly new tyres; bargain, £15.—Groves, 21, Silcott St., Brightonsea. [X1749]

4 h.p. Douglas and Douglas sidcar, 1915, 3 speeds, kick start, and clutch, lamps, and horn; £60.—Moffat, Yeovil. [6711]

DOUGLAS, 1912, new tyres, 2½ h.p., lamps, etc., perfect; must sell; £17/10.—11, Luna Rd., Thoriton Heath, S.E. [6713]

DOUGLAS, 2½ h.p., 1913 model, 2-speed gear, free engine, kick starter, footboards, and accessories; £32.—Moss, Wem. [X1927]

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ALL GUARANTEED IN GOOD  
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REX, 1914, 6 h.p. de Luxe, 3-speed model, coachbuilt Sidcar, chain drive, 650×65 tyres, just been overhauled .....

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HARLEY-DAVIDSON, 7-0 h.p., 1915, 3-speed, with Coronet Sidcar (coach built), head lamp, electric horn, and full complement of tools .....

INDIAN, 1916, 7-9 h.p., Powerplus model, 3 speeds, and spring frame, fitted with dynamo lighting set and de Luxe Sidcar, only done 360 miles, and as new, a great bargain .....

J.H., 1915, 6 h.p., M.A.G. engine, Sturmev-Archer countershaft gear, 3 speeds, chain drive, complete with best quality Canoelet Sidcar, with hood and screen, brand new, but last year's model; list price, £700 .....

REX, 1914, 6 h.p., 2-speed, Model de Luxe, handle starting, twin engine, 650×65 tyres, coachbuilt Sidcar, just been overhauled, excellent condition and a bargain at .....

TRIUMPH, 3½ h.p., 1912, 2-speed countershaft gear, chain-cum-belt, complete with wicker Sidcar; cheap at .....

### LIGHT CARS, Etc.

CARDEN, 1914, 4-5 h.p., Jap engine, 2 speeds, handle start, single-seater, an ideal car for one .....

CARDEN, 1914, 4-5 h.p., similar to the above, but not in quite such good condition .....

MATHIS (M.A.C. model), 8-10 h.p., 3 speeds and reverse, four-cylinder, with sporting 2-seater body, bucket seats, all lamps, and screen .....

G.W.K., 10 h.p., 4 speeds, 80 mm. tyres, 1914 model, just being repainted .....

MORGAN, 1915, 8 h.p. G.P. No. 1, water-cooled, disc wheels, hood and screen, large tyres, all lamps, Binks carburettor, very fast .....

MORGAN, 1914, No. 1 G.P., hood and screen, water-cooled, in running order, but wants about £5 spending to make as new .....

FORD, 1913, 20 h.p., 4-seater, detachable wheels, make a splendid light van .....

SIZAIRE-NAUDIN, 1914, 12-14 h.p. Coupé, C.A.V. large size dynamo outfit, 5 lamps, 5 detachable wheels, just repainted and overhauled, like new .....

CADILLAC, 1914, 20-30 h.p., 6-speed model, 7-seater, does 22 miles per gallon, just overhauled, dynamo light and starting, just being repainted, make a very fine hire car .....

SOLO MOTOR CYCLES.

P. & M., 1913, 3½ h.p., 2-speed model, kick start, fine Sidcar model .....

TRIUMPH, 1914, 4 h.p., 3-speed hub gear, speedometer, and all lamps, all tyres like new .....

ENFIELD, 1915, 3 h.p., 2 speeds, Palmcr tyres, T.T. bars, mechanical outfit .....

DOUGLAS, 1915, 2½ h.p., T.T. model, countershaft gear, 2 speeds .....

INDIAN, 1914, 7 h.p., clutch, just re-enamelled, special carburettor and bars .....

IVY, 1914, 2½ h.p., single speed, 2-stroke, excellent order and condition .....

REX, 1913, 3½ h.p., clutch model, good tyres, magneto, spring forks .....

PREMIER, 1913, 3½ h.p., 2-speed countershaft model, very good Sidcar machine .....

DOUGLAS, 1911, 2½ h.p., 2 speeds, spring forks, Bosch magneto .....

VELOCETTE, 1915, 2½ h.p., 2-speed lightweight, all-chain drive, fine solo mount .....

SUN-VILLIERS, 1914, 2-stroke, single speed, spring forks, footrests, stand, and carrier .....

PORTLAND-J.A.P., 1913, 8 h.p., 3 speeds, B.S.A. gear box, chain drive; T.T. bars .....

Exchanges arranged on any of the above.

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Model H B.S.A. ....	£64 0
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NEW IMPERIAL J.A.P. 2½ h.p., 2-sp.	£36 15
1915 3-speed HARLEY-DAVIDSON ..	£68 5
NEW IMPERIAL J.A.P., 2½ h.p., 2-sp., kick start, and clutch .....	£44 8
NEW IMPERIAL J.A.P., 2½ h.p., 2-sp. 38	
Popular LEVIS .....	£32 0
ENFIELD Combination .....	£39 5
SPARKBROOK, 2-stroke .....	£40 0

#### Second-hand Bargains.

1914 RUDGE, 5-6 h.p., 3-speed .....	£45 0
1914 A.J.S. 5-6 h.p., 3-sp. Combination	£70 0
1914 INDIAN Com., 7-9 h.p., 2-speed ..	£55 0
1915 3-speed HARLEY-DAVIDSON ..	£55 0
1914 3-speed GLYNO and coach Sidecar	£60 0
1915 NEW IMPERIAL .....	£32 10
1915 2-stroke 2-speed VELOCETTE ..	£26 0
1913 MATCHLESS, 3½ h.p., twin, over- head valves, 3-speed .....	£35 0
1910 B.S.A., 3½ h.p. ....	£15 0
1914 M.A.G. MATCHLESS, 3-speed, speedometer, all accessories ..	£65 0
2½ h.p. HUMBER, twin, 3-speed .....	£22 0
1913 BAT, 5-6 h.p., and Sidecar .....	£40 0
1915 MATCHLESS Combination, all accessories .....	£78 0

#### Second-hand Cars.

1914 SINGER, dynamo lighting .....	£175
1914 MORRIS-OXFORD .....	£135
1913 MORRIS-OXFORD .....	£135
1914 CALTHORPE Coupé .....	£165
1915 MORGAN, W.C. M.A.G. ....	£110
1914 HUMBERETTE .....	£90
1914 STANDARD .....	£150
1915 HILLMAN Delivery Van .....	£170
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#### MOTOR CYCLES FOR SALE.

Douglas.

1915 2½ h.p. 2-speed T.T. Douglas, and accessories,  
in good condition; seen any time; £43.—223,  
High Rd., Kibbarn. [6673]

DOUGLAS, 2½ h.p., accessories, fine condition; 17  
gns.; after 7 p.m.—Garrod, 112, Falmouth Rd.,  
New Kent Rd., S.E. [6844]

DOUGLAS, 1915, immediate delivery any 2½ h.p.  
model, including War Office black Douglas—  
Moffat, Yeovil, Tel.: 50. [5855]

1911 Douglas, 2½ h.p.: £18; thoroughly overhauled,  
guaranteed, splendid condition; exchange sidecar machine and cash.  
—19, Garton St., Leicester. [X1694]

DOUGLAS, 2½ h.p., Bosch, good tyres, recently over-  
hauled, splendid condition; accept £22.—Dun, 9,  
Lambolde Rd., Hampstead. [6708]

1915 2½ h.p. Douglas, colonial model, 2 speeds, Lucas  
lamp set, accessories, like new; £44.—8, Stock-  
well Park Walk, Brixton. [6707]

DOUGLAS, 1914, T.T., 2½ h.p., in excellent condi-  
tion, accessories; £35.—Capt. Haynes, Yorks.  
Regt., Rugeley Camp, Stafford. [X1838]

DOUGLAS, 3½ h.p., Sept., 1914, 2 speeds, kick  
starter, clutch, splendid condition; bargain, £42.  
—F. Leo, Hall, Rugeley, Staffs. [X1836]

1916 New Douglas, 2½ h.p. T.T. model; immediate  
delivery from stock—R. Bauber and Co., Ltd.,  
33, Liverpool Rd., Southport. [6219]

DOUGLAS, 1910, good condition, good tyres, £13;  
and one 1912, with 2-speed, good condition, £16.  
—455, York Rd., Wandsworth. [6812]

DOUGLAS, 2½ h.p., 1914, kick start, perfect condi-  
tion, speedometer, etc.; £38.—Cookson, 148, Liver-  
pool Rd., Patricroft, Manchester. [X1827]

DOUGLAS, 2½ h.p., 2-speed, electric lighting, Jones  
speedometer, horn, etc., perfect condition; £34.—  
Harris, 127, Drakefield Rd., Balham. [6647]

DOUGLAS, late 1915, model V, T.T., long exhaust,  
Amac, all accessories, hardly used, like new; £44.  
—Douglas, 1, Church St., Kingston, S.W. [6768]

DOUGLAS Specialists.—Gibb, Gough, London Rd.,  
Gloucester. Gibb, the International Douglas rider,  
winner of numerous cups and gold medals. [1189]

1912 Douglas, 2½ h.p., 2-speed, clutch, as new, trial  
any time, £30; 1910 ditto, perfect running  
order; £15/10.—Ambrose, Station, Burnham-on-Crouch.  
[6803]

1915 Douglas, 2½ h.p., 2-speed, footboards, 2 lamps,  
horn, engine overhauled, condition perfect;  
£46/10.—Robinson's Garage, Green St., Cambridge. [6799]

1914 2½ h.p. Douglas, model U, fine condition, over-  
haul, 2-speed Bosch mag., footboards, horn,  
Lucas head lamp; £35/10.—73, Wilton Rd., Salisbury.  
[X1802]

DOUGLAS, 1915, 2½ h.p., War Office model, 2-speed,  
T.T., electric lighting set, splendid order; £48.—  
Elice and Co., 15-16, Bishopsgate Av., Camomile St.,  
E.C. [0552]

DOUGLAS, 4 h.p., 1915 model A, 3 speeds, completely  
equipped, only run 2,000 miles, equal new; price  
£55; no offers; property of an officer.—The Morris  
Garages, Oxford. [0792]

COLMORE Depot, Birmingham, Manchester, Leices-  
ter, and Liverpool, have in stock complete range of  
all models Douglas for immediate delivery, also full  
range of spares. [0800]

DOUGLAS Motor Bicycles.—2½ h.p. models. We  
have one or two brand new latest pattern  
machines in stock for immediate delivery. The number  
is very limited, and further supplies are almost im-  
possible to obtain. We therefore suggest you order  
from us at once and obtain instant delivery.—Douglas  
Specialists, Robinson's Garage, Green St., Cambridge.  
Tel.: 388. 'Grams: Bicycles. [6793]

Edmund.

EDMUND, adjustable spring frame motor cycles; price  
£46/4; early delivery. Some are financed by others,  
in our case, it is unnecessary; we garage motor cycles for  
1/ per week.—Messrs. Green, Taxis, Villier St. Garage,  
Charing Cross, London. [6639]

Elco.

ELCO, 2-stroke, 2½ h.p., 1915½, guaranteed perfect,  
Senspray; £17, or offer.—F. G. Oswald, 39, Church-  
gate, Leicester. [X1808]

Elswick.

ELSWICK, 2½ h.p., 2-stroke, unriden; £27.—Bond,  
245-247, Euston Rd., London, N.W. [X1812]

Enfield.

ENFIELD New 1916 6 h.p. Combination actually in  
stock; no waiting.—Moss, Wem. [X1928]

ROYAL Enfield, 3 h.p., perfect order, all fittings;  
£28.—12, Manor Park, Lewisham. [X1895]

ENFIELD, 1913, 2½ h.p. twin, overhauled; £17.—  
Smith, 6, Denmark St., Watford. [6705]

COLMORE Depot, 31, Colmore Row, Birmingham,  
for immediate delivery of Enfields. [0801]

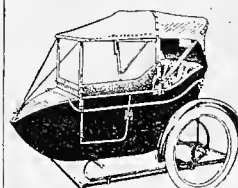
2½ h.p. Enfield 1912 Twin, chain driven, perfect;  
4 cheap.—Hadfield, Uxbridge St., Burton-on-Trent.  
[X1754]

1916 Enfield Combinations actually in stock, latest  
models.—Celtic Motor Works, East Hill, Warran-  
worth. [6398]

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1916 8 h.p. ENFIELD Combination .....	87 gns.
1916 6 h.p. J.H. Combination .....	90 gns.
1916 6 h.p. NEW HUDSON Combination ..	88 gns.
1916 2½ h.p. NEW HUDSON, 2-sp., 2-stroke	£38 0
1916 2½ h.p. OMEGA-J.A.P., 2-speed .....	38 gns.
1916 2½ h.p. OMEGA, 2-stroke, 2-speed ..	38 gns.
1916 5-6 h.p. British EXCELSIOR, Starmey countershaft 3-speed gear .....	68 gns.
1916 4½ h.p. British EXCELSIOR, Starmey countershaft 3-speed gear .....	64 gns.
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3½ h.p. HUMBER, 2 speeds, fine goer .....	£20 0
4 h.p. BRADBURY, single gear, and Sidecar	£15 0
1913 SCOTT, lamp, speedometer, etc. ....	£30 0
1915 WOLF, lightweight, 3-speed .....	£25 0
2-speed RADCO, 2-stroke, fine condition ..	£25 0
2-stroke OMEGA, Dream forks .....	£19 0
1914 DOUGLAS, 2-speed, fine machine .....	£36 0
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3½ h.p. 1908 TRIUMPH, fine goer .....	£17 0
3½ h.p. 1909 REX de Luxe, 2-speed, handle starting .....	£19 0
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New Clincher Clearance Covers, de Luxe, "heavy," rubber-studded, 26x2½, 26x2½, 26x2½, and 26x2½ x 2½ .....	each £1 0

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## MOTOR CYCLES FOR SALE.

## Enfield.

1915 3h.p. Twin Enfield, and accessories, in new condition; seen any time; £42.—223, High Rd., Kilburn. [6674]

ROYAL Enfield (1915), 2-stroke, perfect condition, 500 miles; £35.—E.J.M., Scottish Unionist Club, Edinburgh. [X1690]

ROYAL Enfield, 2½h.p., 2-speed, F.E. clutch, 1912; £20.—17, Wythburn Av., Smedley Rd., Cheetham, Manchester. [X1770]

ENFIELD 6h.p. Combination, new, latest 1916 model, actually in stock; price 85 gns.—The Morris Garage, Oxford. [0811]

1916 Royal Enfield 2-stroke Motor Cycle (new), 2 speeds, free engine, complete; 36 gns.—Hurst, Church St., Poulton-le-Fylde. [6699]

1916 8h.p. Enfield Combinations; 2 actually in stock; £91/5. Easy payments if desired.—Jones, Garage, Broadway, Minswell Hill. [6594]

ENFIELD 6h.p. 1914 Coach Combination, splendid condition, lamps, speedometer, etc.; £58, or near offer.—111, Grundy St., Poplar. [6631]

ENFIELD 1912 6h.p. combination, lamps, horn, speedometer, splendid running order; £36.—9, Church Circle, Farnborough, Hants. [6721]

ROYAL Enfield Twin, 1912, 2-speed, free engine, good tyres, accessories, perfect order; £17/10.—S., 86, Rosendale Rd., Dulwich. (D) [X1798]

ENFIELD 1916 6h.p. Combination, latest model, just arrived from works; £89/5.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6665]

ENFIELD 6h.p. Combination, 1915½, speedometer, lamps, hood and screen, condition as new; £70, or nearest.—H., 49, Woodfield Rd., Ealing, W. [6826]

1914 3h.p. Twin-cyl. Royal Enfield, 2-speed gear, and kick start model, reliable, and speedy, all accessories; £35.—Wauchope's, 9, Shoe Lane, London. [6772]

ROYAL Enfield, late 1914, 6h.p. combination, 2-speed, lamp, horn, speedometer, at works, just overhauled; £45.—F.H.H., Lythwood Hall, Shrewsbury. [X1530]

1913 6h.p. Enfield Combination, J.A.P. engine, only used week-ends, horn, lamp, speedometer; bargain, £43.—Holland, 6, Queen's Parade, Harringay. [6833]

ENFIELDS actually in stock for immediate delivery, 6h.p. combinations, 3h.p. and 2½h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [X1816]

ENFIELD, 1916: immediate delivery of latest 6h.p. combination, now in stock; £89/5; make sure of this now.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6666]

1916 Royal Enfield Combination, used only six times, not run 100 miles, Stewart mechanical horn; £80.—Powell, Grocer and Provision Dealer, Green End, Whitechurch, Salop. [X1753]

ENFIELD 1916 6h.p. Combination, delivery at once from stock; 85 gns.; exchanges or extended terms arranged.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0480]

ENFIELD, practically new, dynamo lighting set, steel stud non-skid, Pillion seat, wind screen, speedometer, watch, etc.; cost £112, sell £80.—Butler, 38, Osney Crescent, Camden Rd., N.W. [6856]

ENFIELD, 3h.p., 1916, latest model, just arrived from works; immediate delivery; make sure of this now; £52/10. We are Enfield specialists.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6824]

ENFIELD 1916 Combinations.—We have them in stock; cash price £89/5. Exceptional exchange quotations; extended payment propositions of any reasonable character entertained.—Layton's Garage, Bicester, Oxon. [X1919]

ENFIELD 6h.p., £89/5, combination; De Luxe combination, with hood and screen, £110; 3h.p., £52/10; all actually in stock; generous deferred payments.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [6741]

## Fafair.

3½h.p. Fafair, Bosch, Klaxon horn, lamp, first-class running; £12, must sell.—Roy, 23, Croham Rd., South Croydon. [6789]

FAFAIR, 3½h.p., mag., B.B., Druids, etc., wants runner; £6/10, offers.—Seen, Rife Range, Newington Butts, Elephant, S.E. [X1761]

## F.N.

4-CYL. F.N.; offers complete or for parts.—Nicholson, Butcher, Barking, E. [6888]

F.N., 2½h.p., mag., Bosch B.B., ready ride away; £9.—Apply, Sheen Lane Garage, Sheen, S.W. [6649]

F.N., 1913, 4-cyl., 5-6h.p., hand controlled clutch, 2-speed, kick start, speedometer, accessories, fitted Chater-Lea sidecar, all new condition; £40, nearest.—A. Griffiths, Priestbury, Cheltenham. [6845]

F.N., 5h.p., 1913, 2-speed, h.b.e. clutch, mag. cutout, Binks latest 3, kick start, speedometer, new cover, excellent condition, underslung sidecar, owner giving up; nearest offer £35 for quick sale, worth £45.—Summerville, Reigate. [6841]

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2½ h.p. Calthorpe 2-stroke,  
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Tourist, 2-speed, clutch  
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LONDON, W.

## MOTOR CYCLES FOR SALE.

## Harley-Davidson.

1916 Harley-Davidsons in stock.—Parker and Son, St. Ives, Hunts. [6901]

HARLEY-DAVIDSONS, 1916 models in stock, also sidecars.—Pickering, Mardol, Shrewsbury. [X1418]

HARLEY-DAVIDSON, 1915 model 11F, 3 speeds, unused; £73.—Bond, 245-247, Euston Rd., N.W. [X1811]

HARLEY-DAVIDSON, 1915, 7-9h.p. combination, perfect order; 65 gns.—3, King's Rd., Windsor. [6694]

HARLEY-DAVIDSONS, 1916 models; immediate delivery from stock.—Colmore Depot, 261, Deansgate, Manchester. [6027]

COLMORE Depot, Birmingham, Manchester, Liverpool, Leicester, for immediate delivery of all models of Harley-Davidsons and spare parts. [0802]

HARLEY-DAVIDSON, 1915, 7-9h.p., 3 speeds and clutch, dynamo lighting set, splendid order, £55; also a standard model at £50.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

HARLEY-DAVIDSON 1915 Combination, Mills Fulford £16/16 sidecar, painted grey to match machine, new Dunlop heavy tyre, horn, and all accessories; £73.—Vincent Motors, Rugeley, Staffs. [X1423]

HARLEY-DAVIDSON, 9-11h.p., 1915 model, electrical equipment, speedometer, bought new 6 months ago, not done 500 miles; accept £60; excellent condition, quite new.—Write, Box 2243, Willings, 125, Strand, W.C. [6659]

1916 Harley-Davidson Combination, electrically equipped, special welded sidecar chassis, Cooper body, with locker in back, cost £111, condition like new, been carefully used; photo; £98.—White, 78a, Junction Rd., N. [6913]

HARLEY-DAVIDSON Electric Combination £89, or standard £80/15; delivered from stock; also sidecars to suit; deferred payments to suit individual requirements.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [6743]

1915 Harley-Davidson, 11F model, 7-9h.p., 3-speed, 2,700 miles only, excellent tyres, Lucas head lamp, rear lamp, horn, Watford speedometer, with Fulford Empress sidecar, with apron, complete; £68.—Robinson's Garage, Green St., Cambridge. [6798]

1916 Latest Harley-Davidson, just delivered from works, complete combination, fitted with £21 sidecar, with lighting set and hooter; immediate delivery from stock; £105/19 cash; extended payments or exchange.—Wauchope, 9, Shoe Lane, London. [6779]

HARLEY-DAVIDSON, the silent grey, 1916 models, immediate delivery from stock, with Gloria, Millford, or Canelet sidecars; two only 1915 electrically equipped models at pre-Budget price, £76/15. Wire or call.—Colmore Depot, 261, Deansgate, Manchester, and 31, Renshaw St., Liverpool. [0817]

## Henderson.

HENDERSON, 1915, 10h.p., 2 speeds and clutch, short wheelbase model, coach sidecar, splendid combination; £68.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

## Hobart.

HOBART, 2½h.p., 2-speed, not done 50 miles, cost 57 gns., must sell, genuine proof; accept 27 gns.—35, Richmond Rd., Kingston, Surrey. [6877]

HOBART-VILLIERS, 2½h.p., 1915, sturdy little machine, extra good engine, overhauled; £21, or near offer.—Layton's Garage, Bicester, Oxon. [X1866]

## Humber.

HUMBER, 2h.p., new tyre; £15.—Mays, 172, Woodhouse Lane, Leeds. [X1841]

HUMBER, 3½h.p., 2-speed, thorough running order; £24.—Sergt. Green, Det. East Yorks, Stunsall. [X1705]

HUMBER, 3½h.p., 3-speed, 1914 combination, as new; must sell; £40, or best offer.—35, Richmond Rd., Kingston, Surrey. [6878]

MOTOR Cycle, Humber 3½h.p., Roc gear, excellent condition; £25, or offer.—A. Buckingham, 7, Lansdowne Rd., Canterbury, Kent. [6652]

1913 2½h.p. Humber, clutch model, new tyres and belt, in good order; a bargain, £17/10.—Jones, Garage, Broadway, Minswell Hill. [6593]

8h.p. 1915 Humber, sidecar combination, twin-cylinder horizontal water-cooled engine, coachbuilt sidecar, speedometer, run 764 miles; price, £77/10.—Martin, c/o The Morris Garages, Oxford. [0813]

1911-12 3½h.p. Humber, 2-speed clutch, lamps, generator, pump, horn, tools, new tyre, new condition, perfect order, stored during war; £14.—24, Tudor Gardens, Barnes, S.W. [6895]

HUMBER Motor Cycle (1913 model), with Mills Fulford sidecar, for sale, 3½h.p., free engine, 2-speed, good condition; price £25, or near offer.—Apply in first instance by letter to Advertiser, 118, Melrose Av., Cricklewood, N.W. [6730]

## Indian.

INDIAN, new 1916 5h.p. model actually in stock, no waiting.—Moss, Wem. [X1930]

1915 5h.p. Indian, 3 speeds, etc., in new condition; £48.—Earl, 5, Heath St., Hampstead. [6869]

## MOTOR CYCLES FOR SALE.

## Indian.

- 1915 Indian 3-speed Combination, fully equipped; £70.—Dale, Church Rd., Burgess Hill. [6704]
- 1914 Indian, 2-speed, clutch, very carefully used; selling cheaply.—Eaden, 15, Church St., Rugby. [X1731]
- 1913 7h.p. 2-speed Indian, £29; Bramble sidecar, coachbuilt, to match same, £6.—Rogerson, Newtown, Wigan. [X1844]
- 1915 T.T. Indian, fine solo machine, little used, as new; £42/10.—Sewell, Melbourne Terrace, Bury St. Edmunds. [6615]

- 1912 Indian, 3½h.p., free engine, perfect order, and very fast; £22.—Gunner Godfrey, 93, Morant Rd., Colchester. [6629]
- INDIAN, 1913, T.T., free engine, roadster model, fast machine, going strong; 30 gns.—Wauchope's, 9, Shoe Lane, London. [6778]

- 1915 T.T. Indian and Sidecar, 5-6h.p., 3 speeds, sporty turnout; £55 cash, no offers; bargain.—12, Heath Rd., Hounslow, W. [6806]

- INDIAN Combination, 1914, spring frame, electric fittings, tyres good, excellent condition; trial; £55.—Tom Davenport, Copleton. [X1855]

- 1914 Handee Special Combination, first-class condition; cost £95, best offer over £50.—Richardson, 29, Silverton Rd., Fulham Palace Rd., W. [6706]

- 7-h.p. 1914 Indian Mills-Fulford Combination, in exceptionally fine condition, electrically equipped, speedometer; £50.—St. Edmund Garage, Northampton. [X1908]

- INDIAN, 1914, 7h.p., T.T. model, clutch, extra fine condition, speedometer, mechanical horn; £35, or very near offer.—Layton's Garage, Bicester, Oxon. [X1867]

- 7h.p. Indian, 1914½, 2-speed, handle start, electrically equipped, speedometer, only done 1,690, new £17/17 Phoenix Indian C.B. sidecar; £50.—26, Clifton Terrace, Brighton. [6822]

- 1916 5h.p. Indian, new February, 3-speed, kick start, electrically equipped, speedometer, Mills-Fulford sidecar, run 1,700 miles; cost £95, accept £72/10.—L1,535, c/o The Motor Cycle. [6597]

- INDIAN, 1913, 3½h.p., 2-speed, free engine, sidecar, Lucas lamp set, speedometer, plenty spares, fine condition, little ridden since war; £32/10.—C/O Edwards' Garage, Child's Hill, Finchley Rd., N.W. [6807]

- 1915 Indian Twin, 3½h.p., 3-speed, kick start, all accessories, with very smart sporting aluminium sidecar, perfect condition, very little used; any trial; must sell; £55 nett.—Hawkes, 43, Blandford Rd., Bedford Park, W. [6662]

- INDIAN, 7-9h.p., and Millford coachbuilt sidecar, late 1915, unspratched, practically new, 3 speeds, rear sprung, rear drive speedometer, electrically equipped, a perfect mount, in perfect order; worth £90, first offer of £70 secures.—14, Ludbrook Rd., West Norwood. [6885]

- INDIANS in Stock.—Latest models, Powerplus combinations, sporting Powerplus 3 speeds models, standard 7h.p. overhead inlet combinations, with lighting set, the famous 5h.p. 3-speed double-pump mount, and 7-9h.p. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [X1813]

## Invicta.

- INVICTA, 2-stroke, demonstrating machine, new condition; £25, or exchange.—35, St. Stephen's Rd., Bow, E. [6890]

## Ivy.

- IVY 1915 2½h.p. 2-stroke, 2-speed, lamp, horn, perfect condition; £20.—Aspinall, Springfield, St. Leeds. [6788]

## James.

- JAMES No. 6 Combinations in stock; no waiting.—Colmore Depot, 261, Deansgate, Manchester. [6026]
- COLMORE Depot, 261, Deansgate, Manchester, have in stock complete range of James motor cycles. [6803]

- JAMES, 1915, 2-stroke, 2-speed, complete with lamp and horn, in new condition; £35.—Sanders, Garage, Kidderminster. [X1751]

- JAMES 4h.p., countershaft gear box, kick starter, chain drive, splendid condition; must sell; first offer £30.—76, Summerley St., Earsfield, S.W. [6625]

- JAMES 1915 3½h.p. Twin, 1916 piston, big end, etc., Senspray, clutch, kick, 3 speeds, T.T. bars, brand new back tyre, F.R.S. lighting, horn, tools, speedometer, nearly £10 spent on her during last 6 months, what offers?—Goodwin, 13, Blenheim Gardens, Cricklewood, N.W. [X1736]

## J.A.P.

- 1915 J.A.P., all accessories; cheap; owner called up.—308, Marylebone Rd., N.W. [6846]

- 1913 8h.p. J.A.P., engine fitted with Bosch mag. and carburettor, four 26x2½ wheels with tyres complete; £18.—Howard, 87, Compton Rd., Brighton. [6690]

- J.A.P. 6h.p. Twin Combination, 2-speed, free engine, generators, lamps, Cowley speedometer, horn, and spares; £30.—Cobbert, Newmillerdam, near Wakefield. [X1771]

- 1913 8h.p. J.A.P. Combination, V.S. 2-speed, free engine, front and rear lamps, accessories, heavy tyres, climb anything, excellent, fine condition throughout; 50 miles trial; must sell; £30.—Gresswell, 20, Amberley Grove, East Croydon. [6838]

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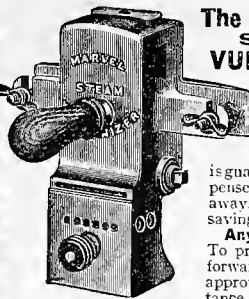
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## Lea-Francis.

- LEA-FRANCIS, 1913, 3½h.p., 2-speed, Lucas lamps, horn, speedometer, back rest, done 6,000 miles; £42.—L1,570, c/o The Motor Cycle. [6687]

## Levis.

- LEVIS, new 1916 Popular model actually in stock; no waiting.—Moss, Wren. [X1929]

- COLMORE Depots, Birmingham and Leicester, for delivery of all models of Levis motor cycles from stock. [6804]

- LEVIS, 1916, Popular models, from stock; £32 cash, or gradual payments.—Wauchope's, 9, Shoe Lane, London. [6780]

- LEVIS Popular Model, new, but slightly shop-soiled; £26/17/6, special bargain.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6664]

- LEVIS, 1915, 2½h.p., 2-speed, free engine, perfect condition, Bosch mag., speedometer, Lucas lamp; cash £30.—Alpe, 71, Tierney Rd., Streatham. [X1860]

- LEVIS, 1916, Popular models.—We are sole Oxfordshire agents, and can deliver correctly tuned Popular models at once.—Layton's Garage, Bicester, Oxon. [X1920]

- LEVIS 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents. Cars and Motor Sundries Ltd., 175-177, Shaftesbury Av., London, W.C. Phone: 1432 Regent. [6711]

- LEVISES, Populars £32, No. 1's with Enfield gear £27/10; actually in stock; deferred payments by arrangement.—Lamp's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [6740]

- 1915 2½h.p. Levis 2-stroke, nearly new tyres, front and rear lamps, mechanical horn, 2 footlamps, all spares, engine guaranteed perfect; £23/10.—Robinson's Garage, Green St., Cambridge. [6794]

- LEVIS, 1914½, 2½h.p., 2-speed countershaft, Bosch waterproof, Cowey speedometer, large 1" and H. headlight, generator, rear lamp, Best and Lloyd lubrication, new studded Dunlop, Hutchinson, just overhauled and enamelled as new; £25.—215, Upper Thames St., London. [6929]

## Lincoln-Elk.

- LINCOLN-ELK, 3½h.p., late 1913, in splendid condition, Whittle belt, accessories; sacrifice £16/10; must sell.—Waddams, Gains Lane, Lichfield. [X1877]

## M.A.B.

- 1913 M.A.B. 3½h.p. Twin, Enfield 2-speed gear, clutch; 27 gns.—Troward, 78, High St., Hampstead. Phone: 5392. [6925]

## Maori.

- MAORI, new 1916 2½h.p., infinitely variable gear, special Colonial model, demonstration machines; 150 m.p.g. guaranteed.—Illustrated particulars sent on application, or may be seen at Johns, Bannister and Co., Ltd., Manufacturers, 16a, Addison Av., W. [6638]

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- MARTIN-J.A.P., 2½h.p., adjustable pulley, forced feed Amc. Bosch, nearly new tyres and belt, lamp and generator, new tools, etc.—Vincent Motor Co., Rugeley, Staffs. [X1760]

- MARTIN-J.A.P., latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear, £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [6760]

## Matchless.

- MATCHLESS 1913 8h.p. Coachbuilt Combination, overhauled and re-namelled; £37/10.—73, Kent House Rd., Beckenham. [6854]

- MATCHLESS, 8h.p., 2-speed, with sidecar, speedometer, lamps, etc.; bargain, £35.—Percival, 137, Gathorne Terrace, Leeds. [6764]

- MATCHLESS, 1915, latest sprung wheel sidecar, 8B, M.A.G., dynamo lighting; £90, no offers.—Watson, 50, Boone St., Lee. [6791]

- LATE 1914 8h.p. 8B. Matchless Combination, kick start, Gradua gear, lamps; any trial; £50; after 7 p.m.: owner at Front; must sell.—Tink, 28, Howley Place, Lambeth, S.E. [6760]

- MATCHLESS, 1913, twin J.A.P., 2-speed, with Dunhill coachbuilt 2-seat, sidecar, fine passenger outfit, recently overhauled; worth easily £50, accept £42.—Layton's Garage, Bicester, Oxon. [X1921]

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- 1914 3½h.p. Motosacoche, Enfield gear, tyres good, horn, not used since; £5 overhaul by Motosacoche; £35.—Godwin Bros., Woking. [X1885]

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- 1915 New Hudson, 2½h.p., 2-stroke, speedy, and reliable; £21.—6, Eve Rd., Tottenham. [X1937]

- 1914 4h.p. New Hudson Canelet Combination, 3-speed, fine condition; £38.—23, R.F.C. Villas, South Farnborough. [6855]

## MOTOR CYCLES FOR SALE.

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NEW Hudson, 1913-1914, 3-speed and clutch, and sidecar, lamp set, horn, nearly new; £30.—Fox, 61, Blackfriars Rd., S.E. [6758]

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NEW Hudsons.—1914 Big Six combination, 1913, 3½ h.p. J.A.P., New Hudson, 3-speed, good condition; what offers?—Sergt. Morgan, Talgarth. [6698]

1913 3½ h.p. 3-speed New Hudson and Sidecar, in perfect order; £30; easy payment if desired.—Jones, Garage, Broadway, Muswell Hill. [6907]

NEW HUDSON, 3½ h.p., Armstrong 3-speed, wicker sidecar, in excellent condition, all accessories; £35, or near offer.—Hoskins, Woodside Green, S.E. [6766]

NEW Hudson, 3½ h.p., 3-speed clutch, kick starter, Godiva coachbuilt sidecar, speedometer, lamps, first-class condition; £39.—177, Aldborough Rd., Seven Kings. [6763]

1913 New Hudson, J.A.P. 2½ h.p., 3-speed clutch, excellent order; £23, offers; exchange higher power; seen by appointment.—Betterton, Brewery, Cheltenham. [X1878]

1914 New Hudson Big Six Combination, splendid condition, done under 3,000, head, screen, speedometer, P.H. lamp, spare tyres, etc.; £55.—13, Berkhamsted Av., Wembley. [6821]

1914 6 h.p. New Hudson Combination, hood, wind screen, 3-speed, kick starter, head lamp, speedometer, etc., splendid condition, climb anything; £57.—Hartley, Draper, Daltou-in-Furness. [X1887]

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1916 New Imperial-Jap in stock; 35 gns.—Cross, Agent, Rotherham. [X1831]

NEW Imperial, 1915, lamps, etc.; 26 gns., or offer.—322, Green Lanes, N. [6887]

NEW Imperial-Jap, 1916 models, in stock; £38 and £44/8.—Crow Bros., Guildford. [6450]

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IMPERIAL-J.A.P., 1916, latest model, 2-speed, in stock; £38.—Layton's Garage, Bicester, Oxon. [X1917]

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NEW Imperials, the handy lightweight, with J.A.P. engine and 2-speed gear. We are the accredited agents for Manchester and Liverpool district, and can offer immediate delivery from stock; extended terms and exchanges arranged. Call or write.—Colmore Depot, 31, Renshaw St., Liverpool, and 261, Deansgate, Manchester. [6814]

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1915 New Ryder-Jap, 2 speeds, in splendid condition; £26/10.—Earl, 5, Heath St., Hampstead. [6870]

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1916 3½ h.p. T.T. Norton ready for delivery.—Parker and Son, St. Ives, Hunts. [6903]

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N.S.U., 2 speeds, 6 h.p., free engine, good running order; illness cause of sale; £20, or near offer.—Walters, 69, Wyndham Rd., Camberwell, S.E. [6756]

## O.K.

O.K. Mark IV., just new; best cash offer.—Laybourn, Wolsingham, S.O., Co. Durham. [X1527]

O.K., 2 h.p., 2-speed, nominally shop-soiled; to clear at £30.—Mecton, Motors, Dorking. [6551]

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O.K. Junior, 1916, 2-speed countershaft, ridden 400 miles; owner too nervous; rear lamp, horn; £24.—Harris, 55, Chestnut Rd., West Norwood. [X1735]

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1914 3½ h.p. P. and M., 2-speed, wicker sidecar, in perfect condition; cash or easy terms; £45.—R. E. Jones (Garages), Ltd., Swansea. [6721]

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6 h.p. Peugeot and Sidecar, very fast; must clear; £18, first cheque.—C. Baker, Crowland, Peterborough. [X1875]

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PRECISION, 4½ h.p., equal new, kick starter, 2-speed gear box, Bosch mag., sidecar, horn, lamps, speedometer, spare tyre and tube; £42.—127, Revelstoke Rd., Southfields. [6726]

## Premier.

1911 Clutch Premier, in good condition; £16; seen any time.—223, High Rd., Kilburn. [6677]

3½ h.p. Premier, 1912, 3-speed, speedometer, lamp, etc.—Hayter, 12, High St., Warminster. [6879]

PREMIER, 1913½, 3½ h.p., 3 speeds, pedal start, sidecar, economical; £30.—231, Westbourne Grove, W. [6899]

PREMIER, 1914, 3½ h.p., 3-speed, clutch, all fittings, kick start, new tyres; £35.—Box 530, c/o The Motor Cycle. [X1800]

1911 3½ h.p. Premier, excellent tyres, engine really good condition, lamp, horn; £11.—Robinson's Garage, Green St., Cambridge. [6795]

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PREMIER, 1913, 3½ h.p., Bosch B. and B., new P. Model, Dunlops, Philipson's pulley, fine running order; sell £22.—Write, 123, Bulwer Rd., Edmonton, N. [6747]

PREMIER, 1914, 3½ h.p., Mills-Fulford sidecar, 3-speed gear, spare belt, good tyres, Stewart speedometer, as new; 42 gns.—Thorogood, 305, Brockley Rd., Brockley. [6627]

PREMIER, 1915, 4 h.p., 3-speed countershaft, only done 600 miles, lamp, Long horn, speedometer, guaranteed perfect; great bargain, £45.—4, Grosvenor Rd., Aldershot. [6839]

PREMIER, 3½ h.p., free engine, H.B. controlled clutch, splendid condition; £20, for immediate sale or £23/10 with sidecar, or near offer.—Seen by appointment, owner called up.—Griggs, Folly Av., St. Albans. [6640]

PREMIER, 1912, 3½ h.p., 3-speed, an unusually fine sample, almost as new, maintaining extravagantly by late owner, good mechanically and almost new in all other details, complete; £26, great bargain.—Layton's Garage, Bicester, Oxon. [X1915]

## Quadrant.

LATE 1914 Quadrant C.B. Combination, 4½ h.p., Armstrong 3-speed and clutch, perfect condition; £38.—113, Kingston Rd., Wimbeldon. [6787]

QUADRANT, 4½ h.p., and sidecar, 1914, 3-speed, clutch, just overhauled, accessories; any trial; higher power needed; £36, or nearest.—Rhiebank, Kentish Rd., Belvedere, Kent. [6680]

1916 Quadrants, 4½ h.p. models, chain-cum-belt, £60; all chain drive, £62; these machines are fitted with B.S.A. 3-speed gear and free engine; your second-hand machine taken in part payment; generous terms, or easy payments.—Wauchope's, 9, Shoe Lane, London. [6776]

## Radco.

1914 Radco, good running order; £13; approval.—Curd, 17, Gardner St., Brighton. [6883]

RADCO, 1915, perfect, lamps, etc.; £23.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [6716]

RADCO 2-stroke Lightweight, Aug., 1915, perfect order; £18.—51, Gilpin Av., East Sheen, S.W. [X1854]

RADCO 2-stroke, 1915, perfect, speedometer, lamp set, overalls, and accessories; £18.—90, Pelham Rd., Wood Green, N. [6835]

RADCO (1915), 2½ h.p., 2-stroke, condition perfect, splendid climber; £20, no offers.—J.H. Serret, Mess, 4th Royal Berks. Regt., Camp 5, Windmill Hill, Andover. [X1748]

## Rex.

REX, 3½ h.p., 1913, free engine, coachbuilt sidecar; £20.—Warren's, Warren St., London. [6810]

REX, 5-h.p., and sidecar, good cover, new Senspray carburetter; £11.—Webb, 22, Cornwall Rd., [6754]

FOR SALE, 5 h.p. twin Rex and sidecar, free engine, Bosch, new tyres; £18.—Apply, 61, Bramble St., Coventry. [X1752]

REX, 5 h.p., mag., Amac carburetter, excellent condition; £15/15.—Mrs. Roskams, 58, Tranmore Rd., Earlsfield. [6737]

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## The Petrol Census.

**M**OTORISTS generally welcome the Petrol Committee's new scheme of ensuring an adequate supply of petrol for essential needs by taking a census of supplies and requirements. If the organisation works well—and there is no reason why it should not do so—then the small quantity now required for recreative motoring should not be at all difficult to obtain, even after priority claims are dealt with. In the past, the trouble has been that the distribution of supplies was bad. In some districts there never has been a shortage, and in certain districts, we are assured, there has been an over-abundance, yet at the same time in the North Midlands petrol has been practically unobtainable by private motorists. All these difficulties in the distribution promise to disappear when the scheme is properly organised, as it should have been months ago. Then motorists, who nowadays use their vehicles for a little recreation and contribute very liberally to the Exchequer for the privilege, may motor with an easy conscience, and not feel that they may be depriving military sections of the precious fluid, as has been suggested. It is "compulsion" applied to petrol.

Anti-motorists cannot or will not see that a man is just as much entitled to buy a motor bicycle as a piano, or any other article which he needs. Precisely the same absurd reasoning is applied to petrol and theatres. Many who profess to regard motoring as unpatriotic are the most regular theatre-goers. The anti-motoring press has spread the notion that the Government would shortly prohibit motoring, and is no doubt disappointed that the move has been a tardy one, and, judging from our information, likely to remain so. Ignorant people do not realise that motor cycling is cheaper than travelling by rail, and that thousands of business men could not manage without a motor of some sort. In defence of the recreative motoring which is indulged in at week-ends

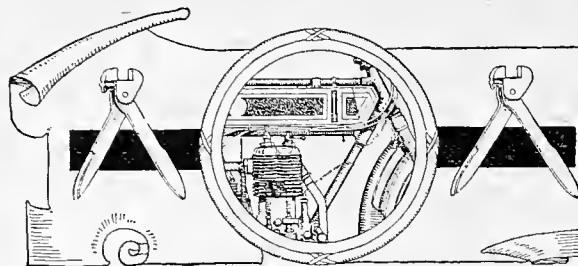
—if it needs a defence—one may cite once again the fact that motoring in the fresh air is far more healthy than spending one's money in a stuffy theatre, picture house, or, indeed, any entertainment indoors. The truth is that it is most unlikely that preventive restrictions will be placed upon motoring. Certainly petrol is not likely to be so easy to obtain as in pre-war days, but there is a reasonable quantity obtainable.

## Claims of the Sidecarrier.

**T**HOSE keen motor cyclists who have the welfare of the movement at heart must have been pleased to note the growing use of the motor cycle sidecarrier since the outbreak of war. Even before the war its usefulness was recognised to some small extent, but last year, when the shortage of horses became keenly felt due to Army demands, the sidecarrier created more marked attention. The fact that this, the most economical form of vehicle, has not disappointed the enterprising tradesman who adopted it has led to its increasing use, and this year promises to see more sidecarriers than ever on the roads. Next week's issue of *The Motor Cycle*, as already announced, will be a special one devoted particularly to the uses of sidecarriers for small tradesmen. In it we shall provide abundant evidence of the economy and utility afforded by the sidecarrier. Tradesmen are able to cover a much wider field by the aid of a faster vehicle, so bringing in more custom.

The purport of this is to appeal to our regular readers to make a point of bringing our Economy and Utility Number of next week to the notice of any tradesman acquaintances, and so help the movement and incidentally the tradesmen themselves. Enterprising shopkeepers are bound to be interested in the Number, and a little missionary work of this kind on the part of readers will be beneficial all round.





## HINTS FOR BEGINNERS.

### TUNING THE POPULAR LIGHTWEIGHT TWO-STROKE.

THE following article may be of some assistance to those two-strokers who desire to obtain the best results from their mounts. Success can only be attained by careful attention to details and being thorough in the work undertaken. Therefore it will be well to make up our minds in starting that it shall be a real overhaul, and I am certain that those who will follow out the advice given will be well repaid for their trouble by the improved running of their mounts and the feeling of greater confidence in their engines and themselves, consequent upon having made themselves more conversant with the details which go to make up the popular and wonderfully efficient two-stroke unit. Now the very fact of their simplicity in construction and the manner in which these engines will continue to go on giving out power are apt to make some of us forget to give that amount of attention necessary from time to time, and at the end of a season's running it really is necessary to go over everything in order. To start with, procure a fair-sized box into which one can put the various parts as they are taken down. First of all remove the footboards, if any, as when they are removed things become more accessible. Next remove the carburetter controls from the handle-bars, and unscrew the union of the petrol pipe at the end where it is attached to the tank, and follow this by removing the inlet pipe with the carburetter still attached, as this saves having too many small parts adrift at one time. Then put the inlet pipe bolts back in their respective places in the cylinder, thus preventing them getting lost. Now remove the compression release valve control from the handle-bars, and then the valve itself from the cylinder. The next in order will be the plug, to be followed by the complete removal of the magneto and its chain, the latter being placed in a paraffin bath; it will be advisable to wrap the magneto up and place it by itself where it can come to no harm, to be attended to later on.

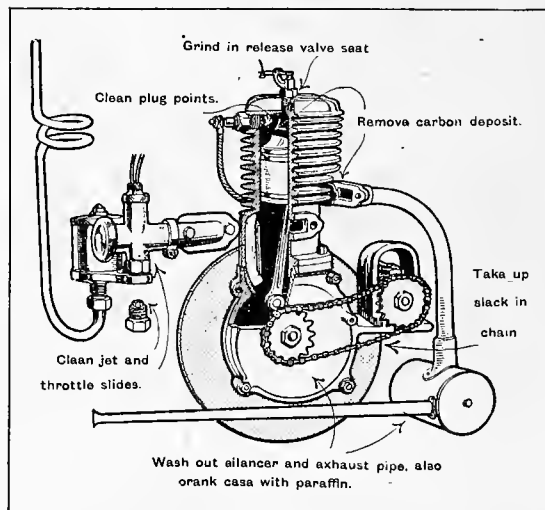
#### Beware of a Cracked Piston.

Now remove the cylinder, which is a very simple matter. There is one point, however, which requires care, and that is, when lifting the cylinder off,

see that the piston is at the bottom of its stroke, as otherwise there is a possibility of the piston and connecting rod falling either backward or forward, causing the skirt of the piston to strike the connecting rod, and a broken or cracked piston may easily be the result. Put in sufficient paraffin oil to fill the crank case three parts full, and leave it there for the time being, as this will give it a chance to soak into any heavy deposits of lubricating oil that may be there. Now clean out the cylinder. This must be done in a very thorough manner; the best tool for the purpose, to my mind, is an old half-inch chisel. If this is used it will be found very effective. Turn the cylinder upside down and insert the chisel, when it will be found, by holding the handle firmly and twisting the hand to left and right, that the business end of the chisel will travel in any desired direction by simply leaning it slightly away from the direction in which you wish it to go. My own experience is that it will remove carbon quicker and more effectively than anything else I have used, while for removing the carbon usually found at the top of the cylinder wall, a quarter-inch chisel cannot be beaten, for usually this top half-inch of cylinder wall is about the most awkward part to get clean, but a quarter-inch chisel will simply charm it away. To those who do not possess these two tools I would say buy them,

as the trouble saved by their use will amply repay their cost—about sixpence each—and they can be used over and over again. Having cleaned the inside of the cylinder, take the ports in hand, and an old pen-knife will be found very useful; with this remove every vestige of carbon from the ports, and finally I would advise a polish up of the port facings with fine emery paper. It will now be necessary to remove all trace of loose carbon and emery dust from the cylinder; this can be done by washing out with paraffin and wiping quite dry with a clean rag, after which place the cylinder on one side away from dirt.

Now devote your attention to the piston. Having removed the rings, which can easily be accomplished by sliding them over pieces of tin slipped under the tips of the rings and spaced at equal intervals round the piston, place them in the paraffin along



Explanatory diagram showing the parts of a two-stroke engine which need periodical attention.

**Hints for Beginners.—**

with the magneto chain; also clean out the slots. To do this get a screwdriver with a blade that fits the slot—the one I use cost one penny—and sharpen the edge. With this it will be found a very simple matter to remove all trace of carbon, and I should like to impress upon my readers the necessity of taking care that every particle is removed, as the effect will be entirely spoiled should any carbon be left in the slots, as it prevents the rings from seating properly, and only by this means can good compression be obtained.

**Cleaning the Crank Case.**

The next item in order should be the crank case. A very good way to clean this out successfully is to use a fairly long and thin handled brush, which has stiff bristles, one such as used for Stickphast paste being quite suitable, but it will be necessary slightly to lengthen the handle by securely tying a piece of wood on to it. It will be found an easy matter to insert this in the paraffin already in the crank case and clean the inside quite well, while the big end will be quite cleaned by carefully revolving the shaft by turning the pulley with one hand and holding the piston with the other hand to prevent it getting a knock. Now remove the draining plug at the bottom of the crank chamber and draw off every drop of paraffin, and it will be well to leave the plug out for an hour or two, so that it can drain out thoroughly.

**Treatment of Piston Rings.**

You can now take the piston rings in hand, the only tool necessary for the purpose being a penknife. With this carefully scrape all deposit from both back and sides, putting no more pressure upon them than is necessary for the purpose, after which carefully wipe them quite clean and see that everything of a foreign nature has been removed. The rings may now be replaced by sliding them over the pieces of tin, but before allowing them to drop into their slots, put a liberal supply of your own brand of lubricating oil all round the inside of the slots. Now this is very important, and it is through omitting to do this that so many riders of two-stroke engines have been puzzled to account for the loss of compression after assembling their engines after an overhaul, for it is impossible to get anything like sufficient compression if the slots are dry, and it would take a considerable time for the oil to work through from the ordinary source of supply. Stuck piston rings can sometimes be traced to this cause through the oil becoming carbonised while passing between the slots and the rings in what must naturally be a very small quantity owing to the small space available when the rings are a good fit. Most piston rings are provided with small slots cut on the inside, which fit on tiny pegs in the slots; these in use prevent the rings from turning round in their slots and the ends coming together. Therefore see that the rings come properly in contact with the pegs at the time of replacing the cylinder. In the case where the rings are not pegged, see that the ends of each ring are on the opposite side of the piston to the ring directly above or below it.

**Re-assembling the Engine.**

Taking it for granted that the crank case has now thoroughly drained itself of paraffin oil, replace the

drain plug, and with an oilcan give a liberal supply of oil to the big end. A good tip in this direction is first to warm the oil, as this makes it thinner, and consequently it will penetrate further into the bearing. In the case where an engine is fitted with oil channels to the shaft end bearings, give a good supply of oil to these also. Now put some oil all round the side of the piston, treating the cylinder wall in a like manner, cut a brown paper washer to the pattern of the cylinder base, but do not forget to see that you leave a clearance for the transfer port and oilways—I have known this to be forgotten with disastrous results—and then give a thin coat of seccotine to each side of the paper, which makes a perfect joint. Carefully place the paper washer in position, and then put the cylinder on again, seeing to it that your piston rings do not move from their proper position. The cylinder can now be firmly bolted on with the knowledge that the work has been well done.

It will now be just as well to find some convenient place to knock in two nails from which to hang the carburetter-control wires and the compression release; these must be hung down quite straight where oil can be injected at the control ends, and while doing other jobs every now and then a further injection can be given, so that the inner cables will have received a good oiling by the time they are again wanted.

A. W. STANBROUGH.

(To be continued.)



"THE MOTOR CYCLE" IN EGYPT.

L.-Cpl. P. G. Burgess, despatch rider in the A.S.C.M.T., in sending us this photograph of himself pays us a compliment when he says that he looks forward to receiving the "blue cover" as much as letters from home. Since the war began we have had photographic evidence of Service readers on all the fighting fronts without exception.

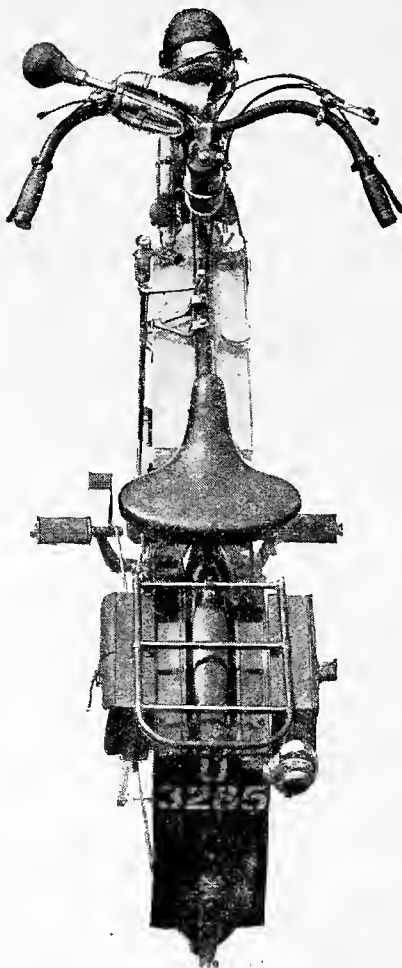
## A SERVICEABLE LIGHTWEIGHT.

**S**INCE my riding consists for the most part of long distance journeys, generally made against time over mountainous roads, I have stuck with a certain degree of consistency to the big, chain-driven "single" for business purposes, finding that this class of mount stood up to the weather and the racket with a minimum of attention. It must further be confessed that hitherto I have religiously eschewed anything in the way of two-stroke lightweights for serious riding, regarding them as a class set aside for city dwellers and golfers—or at any rate as unsuitable for long distance, high speed riding over mountainous roads. Recently, however, the big single shed its sidecar while descending a 1 in 6 gradient at 40 m.p.h., and Messrs. the Headingley Motor Co., of Leeds, placed at my disposal a latest model chain-driven Levis to tide over the temporary indisposition of the four-stroke.

### A Genuine Touring Machine.

This, be it understood, was by no means a pre-arranged journalistic fest, the Levis being one of a batch just delivered for distribution, and having now ridden the machine for some days I must confess quite a new respect for lightweights in general and the Levis in particular. This individual sample of lightweight production is a genuine little touring machine, capable of standing up to the strenuous racket of commercial use, and of taking its rider anywhere that wheel grip and steerage way are possible.

On several occasions I have ridden the Levis with a view to ascertaining the full extent of its endurance, but have as yet failed to reach the limit. I have ridden it at full throttle on long mountain ascents, but only to find that it took top gear half a mile from the summit as though this were the common order of things. Immediately the gradient relaxed in the least degree a

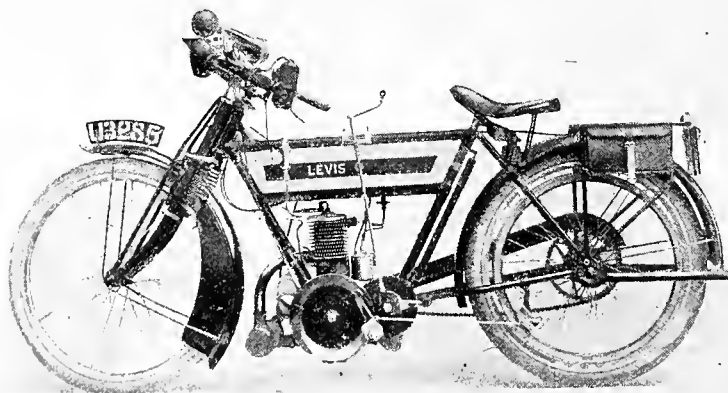


Plan view of the chain-driven Levis, showing controls.

fast on the level. For prolonged speed it did not, of course, compare with a big four-stroke, but for nippiness and quick acceleration on hilly and tortuous roads it compared very favourably.

### Attractive Finish.

Our illustrations convey a fair idea as to the general appearance of the machine. The handle-bars are



Two-stroke chain-driven Levis. The gear is an Enfield.

## A COUNTRY RIDER'S IMPRESSIONS OF THE LATEST MODEL TWO-STROKE LEVIS.

change up was possible, and if the conditions were in any way favourable the engine would pick up in the most extraordinary manner, answering to the entire range of the throttle on the Senspray carburetter. It was, indeed, possible to change on to top gear at certain points in the gradient which would make many  $3\frac{1}{2}$  h.p. four-strokes konk.

To allude to the chain-driven Levis as a "baby" is hardly consistent. As a solo mount it belongs to a class quite distinct from the orthodox babies.

### Hill-climbing Capabilities.

The manner in which the small engine tackled stiff gradients was really precocious. Freak gradients, are not usually considered as within the range of small two-strokes, but the Levis survived several genuine freaks on which it was tested—notably Dent Hill, Park Rash, and Stake Fell. On the top of the latter the engine stopped, but not through lack of power. When will someone bring out a really air-cooled plug of sensible dimensions for two-strokes?

It is superfluous to add that with such vitality the machine proved

fast on the level. For prolonged speed it did not, of course, compare with a big four-stroke, but for nippiness and quick acceleration on hilly and tortuous roads it compared very favourably.

Our illustrations convey a fair idea as to the general appearance of the machine. The handle-bars are particularly well chosen, and convey the general sensation that one is master of the situation. It is a pity that designers of heavyweight machines—particularly sidecar mounts—do not give the same consideration to this point as the designers of lightweights. The handle-bars of many big sidecar mounts are uncom-

**A Serviceable Lightweight.—**

portable and inartistic, whereas those of the small two-stroke are uniformly good.

**The Gear and Minor Points.**

Petrol consumption worked out at approximately 90 m.p.g.

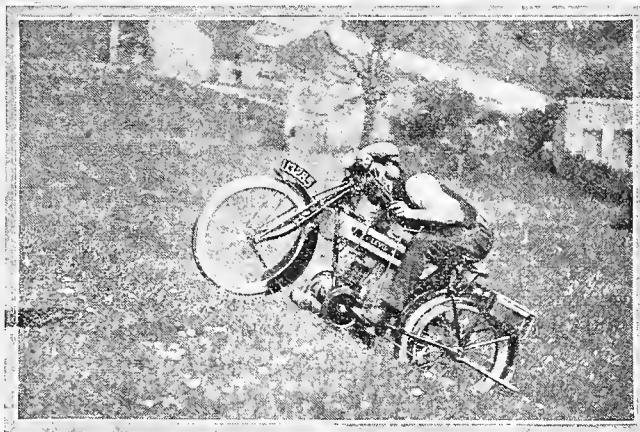
The Enfield gear is certainly an improvement on the simple dog clutch principle, but when new it appears to require judicious handling, otherwise an astonishingly rapid start is made. There are, however, one or two points I am constrained to criticise, though most of them may be consigned to the category of personal tastes. In the first place, it seemed that the footrests were too far apart for good control when it came to difficult riding. One's position was more perfect when gripping the tank between one's knees, but this meant cutting one's shoes on the inside flanges of the rests. Again, it is more restful to support one's weight on the rests if they are reasonably close together than if wide apart.

The tank fillers are of sensible dimensions, but small threads on large members are notoriously difficult to engage. After stopping at a garage for refills I found that one cap had been replaced cross-threaded by the garage boy, and it is quite conceivable that a novice would contrive to ruin the threads in a comparatively short space of time. This point, we are informed, will be revised immediately present difficulties in manufacture are removed.

One item more. As regards lubrication, we found that the most steady supply was obtained by keeping the plunger of the B. and L. drip feed clipped down,

depending on the suction of the engine, and releasing the plunger only when an extra dose was required, but since good results with a two-stroke depend largely on proper oiling, it would be as well to arrange the drip feed at an angle at which it can be seen from the saddle. The rider can, of course, readjust this for himself in a few minutes, but many riders would accept the risk of over or under oiling rather than take the trouble, *i.e.*, they would oil on the principle of "stop when it smokes and give it two when you forget." With the lubricator working automatically and visibly, one is not so much tempted to supply rule of thumb tactics.

H.M.B.



Testing the climbing powers of the chain-driven Levis on a 1 in 3 grass slope.

## CLEANABLE SPARKING PLUGS.

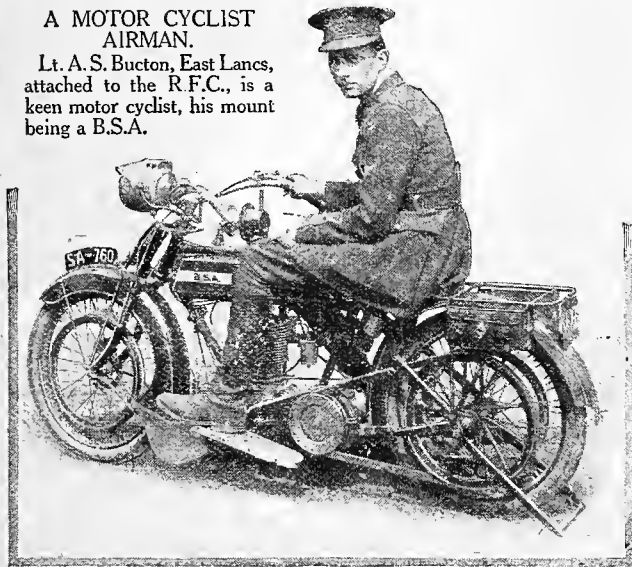
**W**ILL some electrician inform us whether there is any grave and intrinsic defect in the type of sparking plug constructed so that its insulator may be wholly removed from the plug body for cleaning purposes? Not long ago I was sorting my stock of old plugs and testing them in air, with the result that I put aside a couple of dozen which were in perfect order

except that their business ends were extremely foul. The lot had cost over £5 at list prices, and none of them were usable; nor could they be made so by any method known to me. Burning them out with petrol or tickling them with wire bristle brushes is all very well, but you cannot get all the dirt out of the recessed butts, and what remains serves as a magnet for more. I am now using a Forward plug which has a detachable insulator. As there are no competitions going just now, I have no real chance of determining whether it is as efficient as the hermetically sealed types, but it seems to be just the goods for two-strokes, which soil their plugs so quickly. I remember the special plug (an American importation) recommended by the Scott Co. had a detachable insulator, and the plug gap was actually adjusted by threading one or more thin washers under the insulator; which looks as if detachable insulators were good enough for some engineers. I fancy sparking plug practice is largely ruled by the car world, in which accurate oiling is the rule and compression leaks are a fearful bogey. In our world, crude oiling is the rule; microscopic compression leaks do not particularly matter, as we have no quartette of cylinders desired to purr at 80 r.p.m. in free engine and susceptible to disturbance if a cubic millimetre more air gets into one cylinder than the rest receive. So will some of the leading sparking plug makers weigh in with detachable and cleanable insulators and earn canonisation from us riders?

IXION.

**A MOTOR CYCLIST AIRMAN.**

Lt. A.S. Bucton, East Lancs, attached to the R.F.C., is a keen motor cyclist, his mount being a B.S.A.







### **Sprung Frames on Freak Hills.**

I daresay Mr. W. H. Wells will have weighed in warmly ere this, but I was one of many readers who baulked at a certain passage in Mr. G. D. Abraham's fine description of the munition workers' hill-climb at Walna Scar. He remarks that the springing of the Indian ridden by J. G. Bethwaite added to the unsuitability of the big machine for the work in hand. I am quite at one with him in his preference for small machines for this sort of fancy work; any machine is bound to curvet and skid on loose, stony surfaces, and the lighter one's mount is, within reason, the easier to correct its plunges and slides. But why does he regard springing as a handicap in mountaineering jaunts? I am asking for information, as I have not been on a real freak hill since war broke out. But if I were essaying Applecross Hill to-morrow, and were given the choice between a rigid frame and a spring frame, I should plump for the spring frame every time.

### **Automatic Carburettors.**

Is any reader sufficiently experienced in comparative carburetter design and practice to deny or confirm a suspicion of mine? It so happens that during the last six months I have been sampling a great variety of carburettors, ranging from the semi-obsolete two-lever "sensitive" type through the semi-automatic to the latest single-lever notions. Let me explain that I am no scientific investigator; I do not deal in e.m.f. or i.h.p., or even, like one of our contributors, make glass induction pipes and count the flying globules of spirit. But if a maker sends me one of his newest vaporisers, I put it on some handy 'bus, and worry its adjustments in the hope of getting more power or speed or flexibility. Well, during these haphazard experiments it has been slowly borne in on me that the genuinely automatic carburetter mops up a great deal of petrol, and that the two-lever sensitive is an easy first in respect of fuel economy, with the semi-automatic coming betwixt and between. I venture to hope this rough suspicion is accurate, because one knows that you can get a greater mileage from almost any motor car carburetter by fitting a hand-operated air inlet, provided you take the trouble to use its lever intelligently; and the two-lever sensitive is a similar combination, the main difference being that you simply have to operate its air lever, or the engine will not pull.

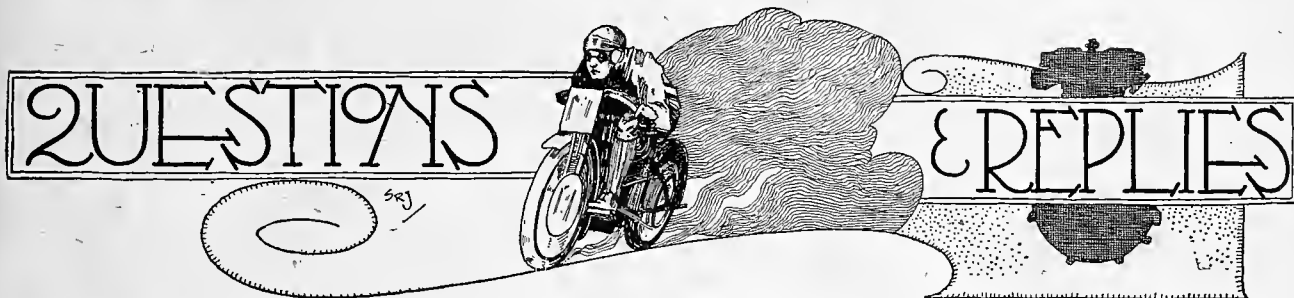
### **It Won't "Blind."**

I often receive letters from disgruntled owners whose machines behave admirably so long as they make no attempt at sustained speed, and the latest epistle of the sort describes how the writer's machine (a first-class touring make) "dries up" after a two or three mile scrap, and concludes naïvely, "Please help me, for I do love blinding!" My experience is that such cases fall into two categories, of which one is easy to remedy, and the other requires an expert. In the first class come such engines as are intrinsically

suiting for prolonged speeds, but may be hampered by a sparking plug which glows incandescent after a few minutes of maximum temperature; the obvious cure is an unheatable plug. In the second come engines which possess too small a clearance between some pair of working parts; it may be the crankshaft or camshaft bearings, the valve stems and their guides, or what not, but in my experience it is more often than not the piston and the cylinder. It takes a good man to discover where the friction develops as the engine heats up, and a better man to cure it, for it is not given to the average amateur mechanic to turn a thousandth of an inch or so off a bush or a shaft without spoiling the part. I was much derided in this paper on one occasion for rashly confessing that I always look for high spots on my piston skirt when I first decarbonise a new engine, and that if I find them I rub them down with a file and a ribbon of sandpaper. But after all, the piston skirt's main function is to act as a carrier for the piston rings, and while a high spot on its skirt may cause a lot of friction, a trivial excess of skirt clearance cannot hurt the engine much.

### **Speed and Plugs.**

Talking of speed reminds me of the year 1909 which I spent trying to prevent a particularly racy  $3\frac{1}{2}$  h.p. single from getting tired. It could do 60 m.p.h. whenever conditions permitted, but it could not keep going, and after a comparatively mild speed burst was sure to stop dead on the next rise, whilst a prolonged scrap would fetch it all up standing on the level. Pre-ignition was naturally the immediate cause, and the primary cause was excessive compression ratio. Of course, I was a bit of a juggins in those days, and never suspected my sparking plug, though I know now that the only month in which it revealed stamina was the month in which I chanced to fit an unheatable plug. I used to decarbonise that engine every Friday night; the works manager at the factory swapped my cylinder twice, in case there should be a rough edge inside the casting somewhere, and he turned me up some special valves minus the usual grinding slots in the heads, lest their edges should be getting incandescent. We live and learn. I have two engines in my shed at this minute, either of which would behave in exactly the same way if they were scrapped on certain plugs in my store. But if I put in a Lodge racing plug, or the Sphinx equivalent, either of those engines would do ten laps of Brooklands all out without a murmur. Stupids we were in 1909; we hadn't the sense to see that the sparking plug electrodes were the most likely cause of pre-ignition, as constituting the longest and thinnest projection into the combustion chamber. On the other hand, sparking plug makers were then equally dense, and though there were even then a few odd plugs which could stand a good deal of heat, their makers were in blissful ignorance of their merits, and did not know how the merits were achieved.



A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

### Removing Tar Spots.

? Will you kindly inform me the best means of removing tar from a coachbuilt sidecar?—E.L.M.

The best plan is to remove the tar before it dries by means of grease or butter. If you leave it for a day or two it is practically impossible to get it off without damaging the paintwork.

### What is a Centre Line?

? Will you please describe the meaning of the centre line when referring to the engine pulley and the back wheel belt pulley or rim? I notice in catalogues the back belt rim is described as being 1½ in. or 2 in. or 2½ in. centre.—E.L.S.

The centre line is that which lies along the centre of the engine pulley and the belt pulley. Talking of the back belt rim as being 1½ in. or 2 in. centre means that from the centre line of the back belt rim to the centre line of the back wheel is 1½ in. or 2 in.

### Photographing while on Tour.

? Would you kindly let me know how the Defence of the Realm Act affects carrying a camera when on tour? If it is necessary to have a permit, does the permit only last for a certain period of time, as I have heard it said that you have to state where you are going, and the permit is only made out for that district. Is it possible to get a permit to carry a camera anywhere, as I often go for runs during week-ends, and would like to have my camera with me? Where do you apply for a permit?—R.W.

Fortunately, as regards photographing, things are not so bad as you would imagine. You may carry a camera anywhere, provided you carry it ostensibly, so that if you are stopped by a patrol and told that a camera must not be taken into any prohibited area you can deposit it, if you cannot get a permit to use it in the said area. In most parts of the country, except in places where special regulations obtain, such as near fortifications or near the coast, people are allowed to use a camera without let or hindrance. When permission is necessary it should be obtained from the local military authority.

### Testing Oil.

? I should be very glad if you would kindly let me know how I can test two or three different grades of lubricating oil to find out their respective properties, flashpoint, residue, etc.—E.H.

To test the flashpoint of oil, place the oil in a receptacle with a Bunsen burner or spirit lamp underneath it and a thermometer suspended in the centre, with its bulb just touching the surface of the oil. Carefully watch the temperature, apply a match at intervals, and at the moment of ignition note the temperature on the thermometer. The residue can be obtained by slowly boiling away the oil. These experiments can really only be satisfactorily carried out by a qualified chemist.

## NEXT WEEK!

PROOF OF THE

## Economy and Utility

OF

## MOTOR CYCLES & SIDECARS.

### Speed Wobble.

? Will you explain and give reasons of a speed wobble? I am given to understand that on attaining a fast speed (about 40 m.p.h.) one is apt to develop this so-called speed wobble, which cannot be accounted for. Is there such an occurrence as a speed wobble on a good road, and what precautions are necessary? Do you think it is caused by nervousness?—RIDER.

This wobble, which is experienced when travelling at speed, is extremely difficult to account for. The most likely causes are the following: Incorrect rake of front forks, whipping of frame owing either to wear or incorrect construction, or wheels slightly out of truth. Also, as you mention, a certain amount of nervousness on the part of the rider might account for it. The wobble should never occur at speeds of less than

60 m.p.h., or thereabouts. Nothing of the sort should be experienced at ordinarily fast road speeds. The remedy is to slow down a little.

### How Much Oil?

? I possess a 1914 2½ h.p. three-speed single-cylinder Premier, and I have been in the habit of giving my engine a pumpful of oil every seven miles. Do you think this rather too much, as I have to decarbonise every 700 or 800 miles?—H.C.J.

It all depends upon the speed at which you are travelling. If you are only going at 20 m.p.h. you should give half a pumpful every seven or eight miles; if driving faster you naturally give more oil.

### Clutch Slip.

? My machine is a 1914 3½ h.p. three-speed. The multiple-disc clutch slips slightly on the level at wide throttle openings and if I suddenly accelerate; on very bad hills it slips quite a lot, especially on the lower gears. The control rod is not holding it out at all, and, so far from over-oiling, I have not oiled it at all for some time, but have simply flushed it out with paraffin. There are ten springs, mostly quite stiff, but rather uneven in lengths and tension; they were like this when I purchased them a little time ago, but the makers said they could not get them more exact than this. When I put them in, I placed the strongest opposite each other, but found (as on previous occasions) that one particular place required three or four very strong springs to make the plates grip evenly; I can find no possible reason for this, but possibly this may give you a clue as to why the clutch slips. Please tell me the reason and the remedy. I may add that the springs are tensioned as tightly as possible.—F.D.S.

What you ought to do is to flood out the clutch again with paraffin and inject thin oil. If you have not enough oil the plates will wear and the clutch will slip. From what you say the springs appear to be strong enough. If, after the treatment we have recommended, you find that the clutch still slips, then possibly an extra plate would cure the trouble.

## PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the import of paper material by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.

**Loss of Compression.**

**Q.** I have a 3½ h.p. three-speed 1916 motor cycle. The compression is very weak. I have examined the piston rings, valves, and seatings. All joints appear to be gas-tight.—PUZZLED.

It is just possible that one of the valves is not seating properly, and you lose compression in this manner. See that the tappets are adjusted so as to leave sufficient clearance.

**Fitting a Magneto Switch.**

**Q.** I ride a 1915 model 2½ h.p. two-stroke motor cycle, and, as you know, two-strokes will "four stroke," or otherwise run irregularly, down hill. I have been thinking that if I were to fit a switch on the handle-bar I could then cut out the magneto, thereby coasting with the throttle a shade open and the air open fuller, thus cooling and scavenging the engine. The magneto is one made by the Elkhart Mag. Co., U.S.A. Will it do the magneto any harm if I connect this terminal to the switch on the handle bar? Also, ought I to use high or low-tension wire? My reason in applying to you is that some people tell me a magneto cut-out does the magneto harm. If this is so, why do the makers fit a terminal opposite to the high-tension terminal?—P.A.S.

It cannot possibly do the magneto any harm to have a switch on the handle-bar. You have to use a low-tension wire, and order from the magneto makers a contact breaker cover to which a switch terminal is fitted, if there is not one already. We should very much like to hear why the extraordinary idea prevails that a magneto switch does a magneto any harm. It would be interesting to know what is the explanation of those who assert this to be the case.

**Unequal Power in a Twin.**

**Q.** Could you possibly tell me why on my 6 h.p. Bradbury the back cylinder will drive the engine alone when the front one has its plug out, but the front cylinder will not act in the same way when the plug is off the back cylinder? Of course, there is no necessity to run one's engine in this way, but I am wondering if the front cylinder is developing equal power to the back one; or is this a usual symptom in twins? Reversing the plugs makes no difference, and with a motor friend I have inspected the magneto and plugs, and found all in order, and the sparks quite even. The carburettor is a B. and B.—S 5780.

Obviously, the front cylinder is developing less power than the back. In the case of a two-cylinder engine it is very rare that the two cylinders give off equal power when tested in this way. Possibly the valves in the defective cylinder require adjusting, the rings may be stuck up, or some small defect of this kind prevents the front cylinder from developing the full power. It is hardly likely that the plugs or magneto are at fault. The trouble is more likely to be such things as difference in the strength of the valve springs, tappet clearances, a badly fitting piston or rings, or uneven lubrication.

**The Storage of Petrol.**

**Q.** I should be greatly obliged if you would tell me what quantity of petrol one is allowed to keep (away from the house, but on the adjoining land in a shed) without a licence. The petrol is for private use only, not for sale.—C.H.F.

A private owner may at the present time store petrol not exceeding sixty gallons in quantity in two-gallon cans in a shed not attached to any main building, and not within twenty feet of any main building.

**Petrol and Fire.**

**Q.** I have just bought a petrol tank which comes within about 2in. of the cylinder head, and I would like to know if there is any danger, say, after running a good distance and the cylinder getting hot, of the petrol catching fire? The heat, of course, would play on the under side.—J.H.

There is no danger whatever of the petrol becoming ignited through the cylinder head being close to the top of the tank, provided, of course, there are no leaks directly on to the cylinder head.

**Removing Rust from Water Jackets.**

**Q.** I should be very much obliged if you would tell me the best way of removing rust which has formed rather thickly in the water jackets of my machine.

Is there any chemical which can be used for this purpose without damaging the metal? I presume a thick coat of rust would affect the cooling principle to some extent.—H.L.A.D.

Use dilute sulphuric acid, if the rust is very bad, and wash out thoroughly afterwards with caustic soda. Certainly a thick coat of rust will affect the cooling system of the machine.

**EXPERIENCES WANTED.**

"R.C.F." (London).—Treatment of tyres with Rubberine and its effect on speed.

"B.W.H." (France).—Flexibility in traffic of a machine fitted with a Philipson or Grado pulley.

**RECOMMENDED ROUTES.****BIRMINGHAM TO PONTYPOOL.—W.H.B.**

Birmingham, Bromsgrove, Worcester, Malvern, Ledbury, Ross, Monmouth, Usk, Pontypool.

**EXETER TO LUTON.—J.T.H.**

Exeter, Honiton, Ilminster, Ilchester, Sparkford, Bruton, Frome, Trowbridge, Devizes, Swindon, Faringdon, Oxford, Thame, Aylesbury, Tring, Dunstable, Luton. Approximately 190 miles.

**RISCA TO LIVERPOOL.—M.A.A.**

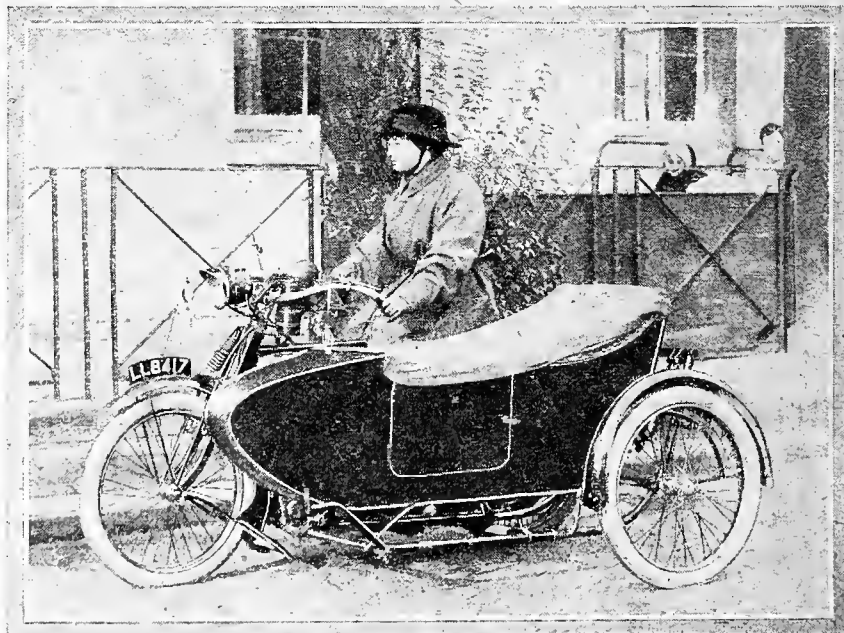
Risca, Abertillery, Brynmawr, Abergavenny, Pontrilas, Hereford, Leominster, Ludlow, Craven Arms, Church Stretton, Shrewsbury, Wem, Whitchurch, Chester, Birkenhead, by ferry to Liverpool.

**BURTON-ON-TRENT TO AYLESBURY.—B.C.**

Burton-on-Trent, Ashby-de-la-Zouch, Atherstone, Smockington, along Watling Street to Daventry, then through Towcester, Buckingham, Hitchchurch, Aylesbury. Approximately 88 miles.

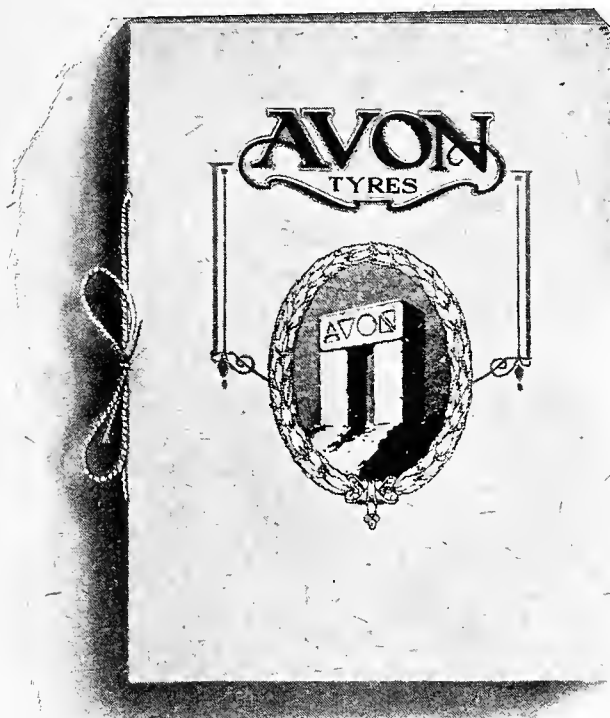
**WEYMOUTH TO BRADFORD.—F.J.M.**

Weymouth, Dorchester, Blandford, Salisbury, Andover, Newbury, East Isley, Abingdon, Oxford, Kidlington, Ardley, Baynard's Green, Brackley, Towcester, Northampton, Kettering, Duddington, Stamford, Grantham, Newark, Tuxford, Retford, Doncaster, Wakefield, Batley, Bradford.



Miss Elsie Hunting, a sister of a ward at the Seamen's Hospital, Greenwich, is a recruit to the ranks of lady motor cyclists. She is shown above, starting for a run on her 4½ h.p. B.S.A. sidecar.

# May we send you this book ?



32 pp.  
fully  
illustrated.

**I**T is full of useful facts about motor cycle and cycle tyres—how to get the most and the best out of them, whether Avons or any other make. It will help you to play your part in the National Thrift Campaign. It is free and post free.

SYNOPSIS:—The Avon Factories—Types of Avon Tyres and Machines for which they are designed—Condensed Hints on Tyre Usage—Correct Treatment for Tubes—Scientific Belt Drive—Avon Honours—The Importance of Inflation—Economical Mileages, etc., etc.

Please ask for the Tyre Book, Section 2 (Section 1 deals with Motor Tyres), and address:—  
**THE AVON INDIA RUBBER CO., LTD., 19, Newman Street, Oxford Street, W.**  
WORKS:—Melksham and Bradford-on-Avon. SERVICE DEPOTS:—Manchester, Glasgow, Birmingham, Bristol, Newcastle, Nottingham, Aberdeen, Swansea, Paris. OVER 1,000 AGENTS STOCK AVONS.

*In answering this advertisement it is desirable to mention "The Motor Cycle."*



## NEWS FROM GERMAN EAST AFRICA

German East Africa is certainly an interesting place from which to get reports on Dunlop motor-cycle belts! And when I hear that *every* belt-driven machine used by the Dispatch Riders under General Smuts' command is fitted with a Dunlop round-top belt, I draw my own conclusions, i.e., that the rigours of active service conditions have served to demonstrate the inherent superiority of yet another Dunlop product.



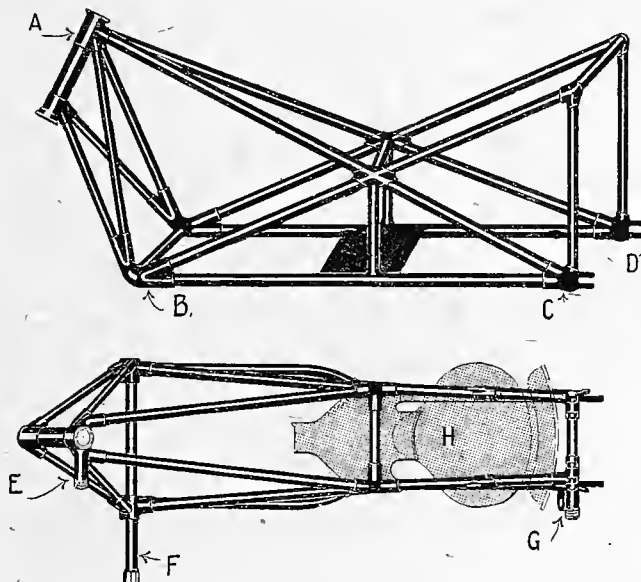
**DUNLOP RUBBER CO., LIMITED,**

FOUNDERS OF THE PNEUMATIC TYRE INDUSTRY,

Aston Cross, BIRMINGHAM. LONDON—146, Clerkenwell Road, E.C. BRANCHES—Coventry, Nottingham, Manchester, Newcastle, Bristol, Leeds, Liverpool, Glasgow, Dublin, Belfast.

# A NEW CLYNO FRAME.

An Interesting Frame Construction.



Elevation and plan views of the recently patented Vickers-Clyno frame.

In view of the articles published in *The Motor Cycle* on the subject of frame design, it is interesting to record that there appears to exist at the present time activity in the development of the frames of sidecar outfits. The tendency is to get away from the conventional type of cycle frame to which the sidecar is attached to the bicycle in the most suitable manner that happens to offer.

In the case of outfits which are primarily intended to be employed with the sidecar permanently attached, some latitude is afforded in the design of the cycle frame and sidecar connections, and the illustrations here given show a construction which has been evolved and protected (patent No. 7,289, 1915) in the names of Messrs. Vickers, Ltd., G. T. Buckham, and Frank Smith (of Clyno fame).

It will be seen that the motor cycle frame is dupli-

cated, comprising two main triangular structures A B C, one at each side. These are braced by additional members, as can be clearly seen from the illustrations, the method of supporting the steering head being clearly shown, whilst the slots for the rear wheel spindle are indicated at D. In the plan view will be seen at E F and G the main connections for the sidecar tubes, and it will be understood that the lateral rigidity afforded by this construction of the motor cycle frame will render the connections E F G extremely stiff, so that twisting of the sidecar in relation to the cycle will be prevented.

The position of the saddle is indicated at H in the plan view, but no clue is given as to the intended disposition of the engine, tank, etc. Until further particulars of this interesting development are available it would be unwise to criticise.

## Next Week's Special Number of "The Motor Cycle."

WHAT THE SIDECARRIER HAS DONE AND CAN DO.



ing delivery of their goods; and the object of the next issue of this journal will be to show what can be done to relieve the situation by the use of a motor cycle with commercial sidecar attached. Not only will the utility of the motor cycle be illustrated, but also its economy.

Experiences of numerous small tradesmen will be a feature, together with an article setting forth the advantages of the sidecarrier for this sphere of work. This will be

accompanied by comparative working costs of light horse vans and motor sidecarriers.

Another article will deal with motor cycles in the hands of press photographers, and many instances will be given where a pressman has been able by means of his motor cycle to secure "scoops" over his less fortunate brethren who had to rely on railway trains or other less convenient means of conveyance.

Then there are the claims of the motor cycle for a doctor; the varied uses of the motor cycle, apart from actual combatant service, in military duties; and many other instances of the utility and economy of the two or three-wheeler. Thursday, June 29th, is the date of the issue.

## VOLUNTEER SIDECARISTS WANTED FOR MANCHESTER.

THE officer in charge, Mr. E. Woods, of the Motor Transport Section, 5th East Lancs. Battalion V.A.D. of the British Red Cross Society, tells us that he is anxious to fill up a few vacancies for owners of sidecars and light cars in the Manchester district who would be willing to join the battalion. The work, part of which consists in taking out wounded soldiers for runs, is entirely voluntary, and can easily be done in spare time, particularly on Saturday afternoons. Those interested should write to Mr. Woods, at 287, Deansgate, Manchester.



A CONTRAST.—A young woman can soon learn to drive a sidecarrier.

A MORE opportune moment than the present for the production of a special number of *The Motor Cycle*, setting forth the claims of the commercial sidecarrier, would be difficult to find. The commandeering of horses in the early days of the war upset the delivery arrangements of many tradesmen, to be followed more recently by the scarcity of men as a result of the Military Service Act. The consequence is that tradespeople, both those with small and large businesses, are in difficulties regard-

## "THE MOTOR CYCLE" RECRUITING SECTION.

This section was instituted with the sole object of assisting readers and directing them to the many different branches of the Army and Navy for which their special knowledge suited them. At the outbreak of war numerous letters reached us (and continue to arrive) from men at home and overseas possessed of motor engineering knowledge, explaining their difficulty in obtaining particulars of Specialised Sections (notably the Motor Sections), recruiting officers being invariably occupied by the demands of the line regiments. The Editor is Inspecting Officer for the M.M.G.S., Heavy Section, Machine Gun Corps, and R.E. Despatch Riders. Throughout, the work has been purely honorary, and Recruiting Commissions have not been accepted. To date 9,868 readers have taken advantage of our proffered assistance.

### R.E. Despatch Riders.

**A** CERTAIN number of vacancies exist in the different areas for Royal Engineer despatch riders. The test applied to candidates is much more stringent than formerly. Applicants must be at least 18 years 9 months, and have had prolonged experience with motor cycles, and capable of all running repairs. The pay in the R.E. Signal Section is 2s. 6d. per day, plus 6d. on passing the engineers' test.

An up-to-date list of secretaries for the different areas was given in our last issue, page 561, and readers residing in the different localities should apply to the local secretary.

All applications for enlistment as despatch riders in the R.E. from the London district and Overseas should be made to the O.C. Signal Service Training Centre, Woburn, Beds., not Dunstable, as stated last week.

A number of riders have been examined by the Editor of *The Motor Cycle* in technical and riding ability during the past week, and passed for the waiting list of the South Midland Divisional area.

### Admiralty Yacht Patrol.

Men possessing workshop experience and a thorough knowledge of petrol engines and the use of tools in connection with their running and repair may obtain positions in the Royal Navy by applying to the Yacht Patrol, Admiralty, London, S.W. Chief motor boatmen, who must be qualified mechanics with at least five years' workshop experience, age



Motor cyclists attached to an ammunition sub-park in France. Reading from left to right the names are: Read, Hudson, Hepworth, Scott, and Hands, the last-named being a former competition rider. All the machines are Douglasses, and particular interest is attached to this picture in that the two sidecars are the new 4 h.p. models. This is probably the first photographic evidence published of the 4 h.p. Douglas on active service.

22-45, are paid 5s. 6d. per day, with 3s. per day allowances. Motor boatmen, with a knowledge of petrol engines and the use of tools in connection with their repair, and possessed of two years' workshop training, age 18-45, receive 2s. 6d. per day with 3s. per day allowances. In addition to this pay a gratuity is made in lieu of uniform, whilst separation allowances are on the same scale as the R.N. Applications by letter should be accompanied by references showing period of workshop experience, medical certificate, and discharges.

### M.M.G.S. and H.S. Machine Gun Corps.

The Motor Machine Gun Service and the Heavy Section, Machine Gun Corps, are still closed. In reply to enquiries, which continue to reach us, we may state that when vacancies occur in these particular sections, an announcement to that effect will appear in these columns.

### The Technical Corps.

The Technical Corps, including the Royal Flying Corps, is now open for practically every trade. The R.F.C. wants a number of motor transport drivers, storemen used to the upkeep of engineers' stores, also sailmen.

### The Motor Transport.

In connection with the Army Service Corps, we are officially advised that motor cyclists are not at present required in the Mechanical Transport branch, but car and lorry drivers are wanted; pay 1s. 2d., rising to 2s. 4d. when proficient. Mechanical Transport examining officers are now scattered about the country on special recruiting work, and application should be made to them through local recruiting offices.

### R.E. Wireless Section.

Mechanics with a good practical knowledge of petrol engines, and able to perform repairs to such engines in the field, are required by the Wireless Section of the Royal Engineers. The applicants will be required to enlist as sappers in the Wireless Section of the Royal Engineers, but we are informed by the O.C. of the Training Centre that the prospects of promotion for satisfactory men are very good. Enlistment is for duration of the war, and applications, mentioning qualifications, should be addressed to the O.C., Wireless Training Centre, Worcester.



STAFF OF THE MOTOR MACHINE GUN SERVICE TRAINING CENTRE.  
Reg. Sgt.-Maj. Dowland. Maj. J. S. Archer. Lt.-Col. R. J. Colson. Maj. E. J. W. Spread, C.O. Adjutant.

# THE LONGUEMARE-HARDY CARBURETTER.

An Automatic Carburetter for Use on Motor Cycles.

**N**OW that automatic carburetters are becoming more and more general for motor cycle use, it is likely that the model which we describe and illustrate will be adopted on many machines. The principle has already been proved to be most successful in the larger sizes for car work.

In the old days, the great majority of motor cycles were fitted with Longuemare carburetters, and they gave most excellent service. The rose-jets vaporised the petrol very satisfactorily, and if, owing to their smallness, the jets sometimes became obstructed, they were easy to clean. Briefly, this carburetter contains a reserve chamber to supply a rich mixture for acceleration purposes, and a pilot jet for starting and slow running.

When the float chamber is filled, petrol passes through the primary jet A, which controls the supply of fuel used in general running into the reserve chamber B, as well as into the main and pilot jets C and D. At starting the position of the throttle is as shown in the sketch on the right. The main jets are cut off, and the suction of the engine acts through the small openings E and F upon the pilot jet only, which therefore supplies a small quantity of rich mixture. A certain amount of air is allowed to pass between the top of the jet and the throttle barrel, a further supply controlled by a regulating screw being admitted through the hole G. While the pilot jet only is in use the primary jet A is able to supply more petrol than is being used by the engine, consequently the reserve in the chamber B is not used. When, however, the throttle is opened and the main jets C come into play, more petrol is required for acceleration purposes, and this is supplied from the reserve petrol in B. As the engine speed increases this petrol is used up and air enters B through the hole at the top, and, mingling with the petrol above the jet A, gives an economical mixture so long as the engine is running fairly fast. Should the engine speed be reduced, the suction on the jet becomes less, and, instead of the mixture becoming weaker when a stronger mixture is required, the air coming through B is cut off by the petrol rising in the reserve chamber, since the engine is not taking all the fuel supplied by the primary jet A. Thus the reserve fills up ready for the next acceleration.

It is in this matter of acceleration that many automatic carburetters fail, for, unless the mixture is set on the rich side and the carburetter consequently extravagant in fuel, it is apt to be too weak to give that rapid pick-up which at times is so desirable.

## Fitting and Adjustment.

Every carburetter is sent out with an assortment of jets and choke tubes. When those in place have been tested the others can be experimented with if necessary. If the engine pulls well at half throttle but weakly at full throttle, fit a larger primary jet, for

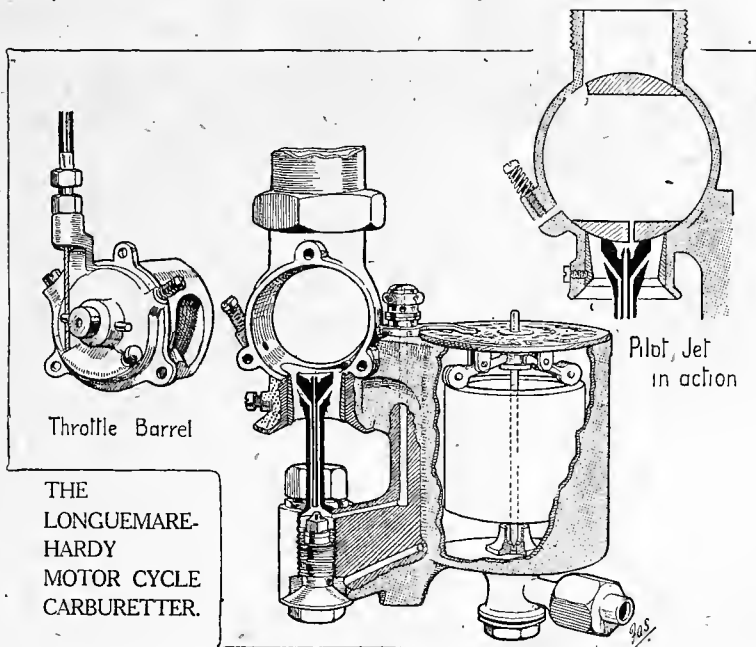
more petrol is required. If the reverse, a smaller primary jet. Poor acceleration means that the choke tube is too large (this is held in place by a screw and can be quickly changed), while good acceleration but weak running means that it is too small.

Further, the throttle opening for slow running can be regulated by means of the screw H, and the pilot jet mixture by the screw K. It is the work of a moment only to remove the throttle complete with the returning spring; this gives access to

the choke tube. For convenience the petrol pipe union is rotatable about the base of the petrol chamber.

It is interesting to note that Messrs. Humber are fitting the Longuemare carburetter to the horizontally-opposed twin-cylinder sidecar outfits which they are supplying to the Russian Government (see page 569 of our last issue). This is a good testimonial in itself, for it is certain that no expense is being spared to render these machines as simple and efficient as it is possible to make them.

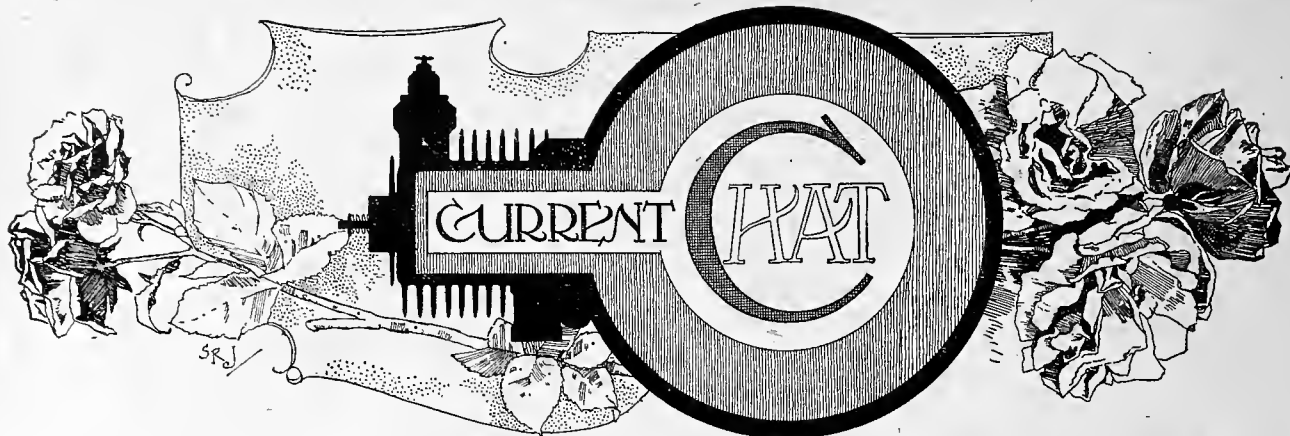
The English agents are Messrs. E. J. Hardy and Co., Queen Victoria Road, Coventry.



A primary jet; B, reserve chamber; C, main jets; D, pilot jet. These and the other letters are referred to in the letterpress.

**TRADESMEN** desiring rapid  
and economical Parcel Carriers will be  
particularly interested in next week's  
UTILITY NUMBER of this journal.





## TIMES TO LIGHT LAMPS.

"SUMMER" TIME.

June 22nd	...	9.49 p.m.
" 24th	...	9.49 "
" 26th	...	9.49 "
" 28th	...	9.49 "

## Leading Manufacturer Married.

On Tuesday, the 20th inst., the wedding took place of Miss Doris Pritchard and Mr. William Hughes Butterfield, one of the partners of the Levis Co., at St. James's Church, Moseley Hill, London, N.

We extend our best wishes.

## American Competitions in Full Swing.

Glancing through latest copies of our American contemporaries makes one long for the end of the war and the return of competitions. At present on the other side of the Atlantic hill-climbs and club runs are in full swing, and a great part of the papers is devoted to descriptions of the events.

## Racing in the Argentine.

A 220 miles road race was held recently by the National Motor Cycle Club of Buenos Ayres. Results were as follow:

A. Bernasconi (Harley-Davidson).

C. Santiago (Indian).

J. Hourdebaight (Indian).

Winner's time, 5h. 33m. 30s.

This is the second year in succession Bernasconi has won the event.

## The Thornton Heath Wounded Soldiers' Outing.

The wounded soldiers' outing (referred to on page 564 of last week's issue), which a patriotic inhabitant of Thornton Heath, Mr. Alfred Taylor, is proposing to organise, will consist of an excursion from the clock, close to Thornton Heath Station, starting at 2 p.m. on Wednesday, July 5th, to Leith Hill Hotel, where tea will be provided, the cost of which will be 1s. The route followed will be Sutton, Epsom, Leatherhead, Dorking, and Coldharbour, the distance being about twenty-five miles. Tea, which will be supplied by the driver to his guest, will be served at 4.30 p.m., and the return journey will be made via Westcot, Dorking, and Reigate, the starting point being reached about 7.15 p.m. Mr. Taylor has already been promised assistance from eight or nine local drivers of sidecar combinations. Offers addressed to Mr. Taylor, c/o *The Motor Cycle*, 20, Tudor Street, E.C., will be forwarded to the right quarter.

## Many Accidents.

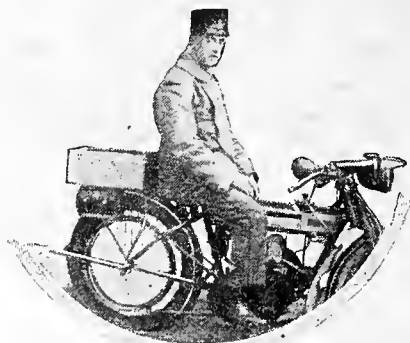
A number of accidents involving motor cyclists have occurred of late on the English roads. Many riders are soldiers, and there have been one or two fatal results. About twelve months ago, for a period of a few weeks, there was a regrettable run of accidents, and we hope this is not going to be repeated. The only thing to do is for every road user to exercise double care, as one is forced to the conclusion that there are many novices on the roads.

## Motor Cyclists in Line Regiments.

Though motor cyclist despatch riders are attached to the different Yeomanry regiments, it is seldom, if ever, that they are allowed to proceed abroad with their units. According to letters which have reached us, on several occasions motor cyclists who have served their training as despatch riders have finally been put into line regiments with a rifle, on account of their units having been ordered to proceed abroad without motor cyclists.

## Legless and only One Arm but still a Keen Rider.

A Los Angeles cripple—A. Leroy—is touring the American Continent on a Harley-Davidson sidecar. Leroy has both his legs off at the hips and his left arm at the elbow, but he is able to sit in the sidecar and operate the specially adapted controls. There is no saddle on the machine at all, which is started by a hand lever at the side. The handlebars are displaced by a rod fastened to the head of the steering column and at its other end to the stump of Leroy's arm, with which he steers.



A Dutch military despatch rider, F. Schuwer, and his Douglas.

## SPECIAL FEATURES.

USEFUL HINTS TO TWO-STROKE USERS.

A MOBILE SECTION IN TRAINING.

## Who Said Economise?

What absurd logic it is to hinder motor cycling, when travelling by motor cycles is still cheaper than journeying by train! Those who are not acquainted with the economy of motor cycles should see the special articles in our *Economy* and *Utility* Number to be published on the 29th inst.

## A Belated Decision.

At a committee meeting of the Woolwich, Plumstead, and District M.C.C., not only was it decided to postpone all competitions, etc., *sine die*, but no further committee meetings will be called until the war is over.

## Learning to Drive on a Main Road.

On Saturday last a woman was seen teaching another to drive a small car on a main road along which there was an almost continual stream of motor cycle, car, and pedal cycle traffic. The new driver was evidently ill at ease, and she narrowly avoided running into two pedal cyclists. Surely novices should be made to learn to handle cars or cycles, as the case may be, on by-roads before trying on a main road with heavy traffic.

## Shortage of Petrol and a More Serious Shortage of Cards.

No wonder the post offices in different districts ran out of petrol cards! Any Tom, Dick, or Harry could go and get one, or a complete set of them for that matter, by applying to a Money Order office.

The announcement that cards were available having been left to the daily press (the motor journals were ignored), no doubt the curiosity of many was aroused, and whether they owned a motor vehicle or not applied for a petrol card. Otherwise how can the shortage be accounted for? Manilla card, too, is not cheap in these days, and, as a sister journal pertinently asks in the current issue, what does the War Savings Committee think of this waste? Apparently there was no check of any kind on the distribution of the cards. A bad beginning indeed!

**The Specialised Sections.**

The Recruiting page this week contains announcements of a number of vacancies which exist for practical motorists.

**A Prohibited Poster.**

A four-sheet poster displaying Beldam tyres, now to be seen on different hoardings all over the country, has been rejected by the Censorship Committee. The decision has greatly surprised the Beldam Tyre Co.

**The Light Car in Combatant Service.**

Light cars are being tried by the Motor Machine Gun Service for rapidly transporting machine guns. Some exclusive photographs of the equipment appear in *The Light Car* published yesterday (Wednesday).

**The National War Funds.**

At the week-end the principal war relief funds stood as follow:

The Prince of Wales's National Relief Fund	(£3,318,000 distributed)			
		£5,907,213	0	0.
Fund for the Sick and Wounded		3,900,000	0	0
Tobacco Fund		108,632	6	11
The Queen's Work for Women Fund		169,574	14	4

**British Motor Cycles for Italy.**

The Italian Government has now decided to try the Douglas motor cycle, and has ordered a hundred machines of the three-speed clutch type. Hitherto the Italian Government has not looked favourably upon the lighter types of motor cycles, so that the decision is of more than ordinary interest.

The Prince of Udine of the Italian Royal family has also ordered a 4 b.p. Douglas.

**Motor Cyclist Airman.**

Capt. Jack Woodhouse, R.F.C., is proving a more daring aviator—if that is possible—than motor cyclist. His magnificent riding in the Isle of Man and other places in peace times has now been eclipsed by some daring performances in the air. A few days ago, at a police sports meeting in the Midlands, Capt. Woodhouse appeared overhead, and proceeded for about a quarter of an hour to send thrill after thrill through the crowds of spectators. He looped the loop many times, performed spiral dives, and finally circled the grand stands practically at right angles to the ground!

**Records after the War.**

Shall we see records go by the board immediately the war is over? It would appear that there will be much slashing of times, if we are to judge by letters we are constantly receiving, particularly from men in the Services. One writer, whose name is by no means unknown in the competition world, offers to guarantee that he will bring down the hour sidecar figures "without the least fuss" on his Harley-Davidson machine. Another writer, J. Cooper, of Gosport, writing concerning the same make of machine, claims to have attained the speed of 74 m.p.h. with another man on the carrier. He states that he is perfectly willing to take anyone who cares on the pillion seat, so that he may prove the truth of his remarks by his Cowey speedometer. No doubt hundreds of readers will jump at the opportunity!

**Reserve Petrol.**

We observe that many motor cyclists are making a practice of carrying a spare tin of petrol on their machines, as we have advised. This seems to be the surest method of getting home when visiting doubtful districts, and one may travel free from worry as to a possible shortage of fuel.

**The Don't Posters.**

The War Savings Committee's posters have been seen of late in the Midlands. They are not at present on the gigantic scale that they are in London, and few provincial motor cyclists will have yet seen the appeals for the giving up of pleasure motoring. But surely the time and money spent on fixing up so many huge posters in town could have been much more profitably used.

**More Petrol Waste.**

Colonel R. W. Barclay has reluctantly been compelled to close the Nower, one of the beauty spots of the Dorking district, the reason being the bad behaviour of the crowds of London people brought down, especially on Sundays, by motor buses. The park has been littered with broken glass and other rubbish. The petrol used in this manner certainly might be better employed.

**For the Novice.**

After a short interval we have renewed our "Hints for Beginners," an article published to-day describing in simple language the method of overhauling a two-stroke engine. This, in conjunction with the large sectional views showing the cycle of operations in a two-stroke published last week, should enable the absolute novice with a two-stroke to become quite at home with his mount.

**Still More Lady Riders.**

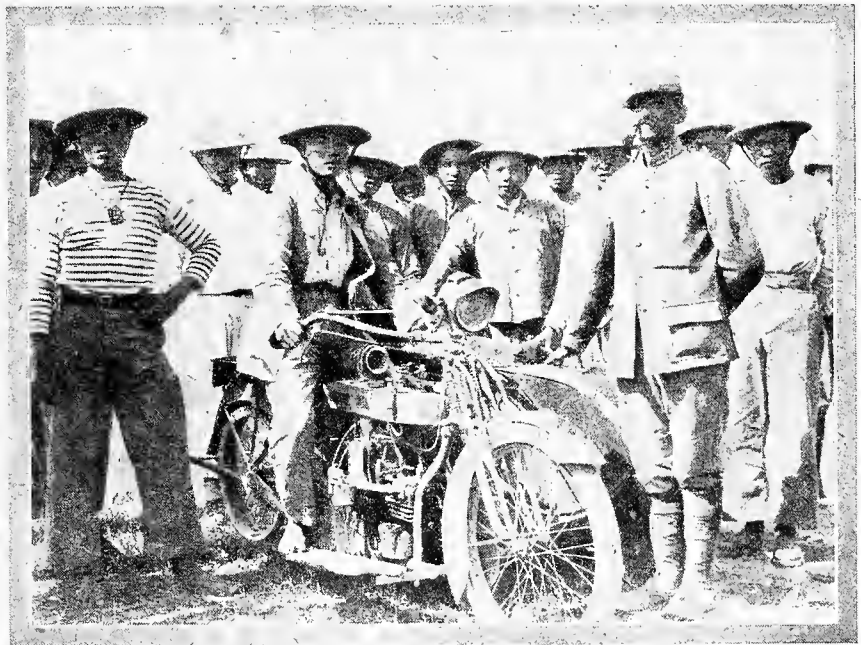
It is gratifying to notice the increasing number of girls and women riding motor cycles. Sidecar outfits in particular appear to be very popular with the feminine sex, and it is quite common to see a lady taking a friend for a run. When the seasoned riders of the pre-war days come home after the war one of the surprises they will experience will be in the number of lady motor cyclists on the road.

**T.T. Rider as Instructor.**

Leon Cushman, formerly of the Coventry Premier, Ltd., and now with the R.N.A.S., is at present acting as instructing officer on aero engines at an English aerodrome. He writes that he would prefer a few laps of the Isle of Man course, and doubtless so would many other well-known riders who are now in the Services.

**An American Four Hundred Miles Trial.**

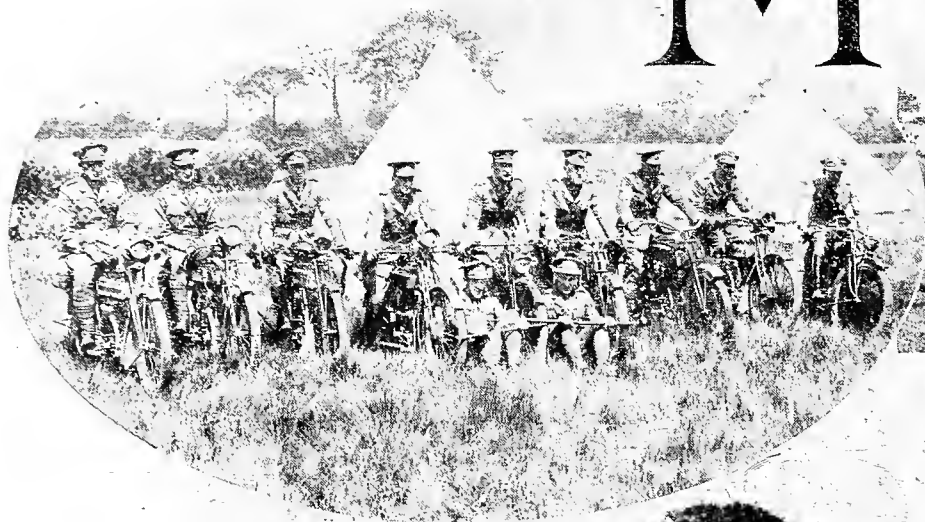
There were forty-five starters in a 400 miles—two days—reliability trial held at the end of last month by the New Jersey M.C. By far the greatest proportion of riders were mounted on Indian and Harley-Davidsons; in fact, the only other mounts represented were Reading-Standard and Cleveland. The latter is a two-stroke lightweight that has been illustrated in *The Motor Cycle*, and it met the Indian lightweight in open competition in the special class provided for the little 'uns. A Cleveland rider won in his class. There appear to have been a great number of prizes, but the chief award went to the Harley-Davidson. This prize was the Dealers' Trophy for the team of three professional riders having the highest aggregate score.



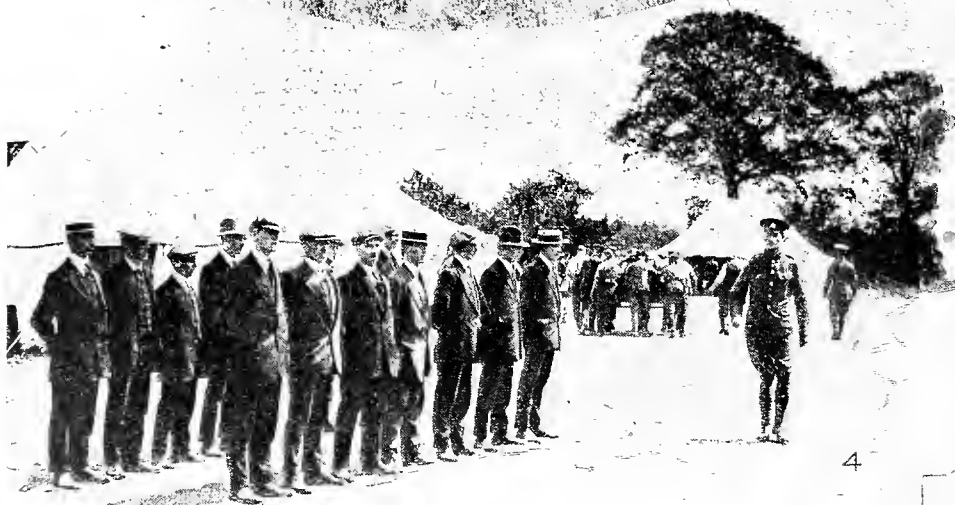
FRENCH COLONIAL TROOPS FROM COCHIN CHINA—AND THE INEVITABLE DOUGLAS.

The Annamites from Cochin China have arrived at Salonika, where this photograph was taken. Their head dress, which might almost be mistaken for a steel helmet, is worthy of note.

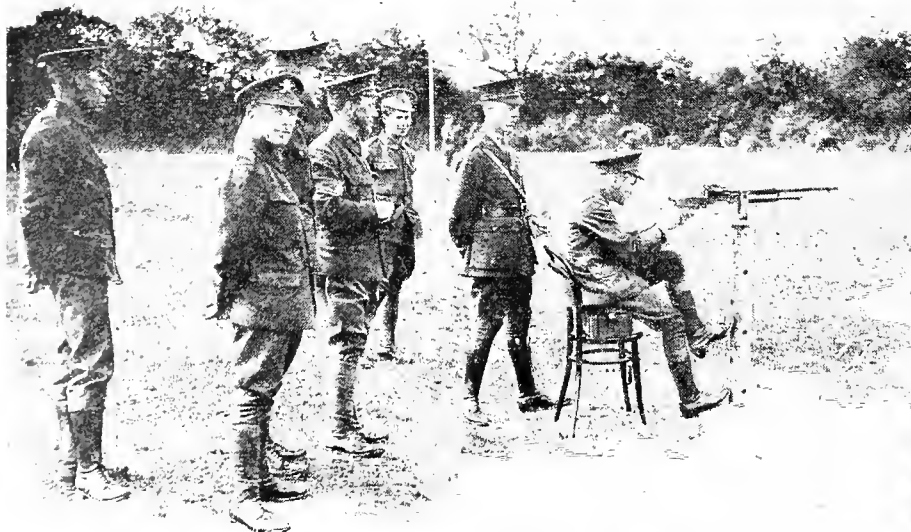
# A MOBILE SE



*OUR pictures show various Heavy Section, Machine Gun Section, the main personnel of the Motor Cycle Corps. Men must be possessed of more readily to grasp the intricacies of and maintenance in first-rate repair power which form the section's*



4



(1.) Group of motor cyclist officers attached to the Heavy Section, Machine Gun Corps.  
(4.) The first day in camp. Arrival of a batch of raw recruits.  
(7.) Machine gun practice.

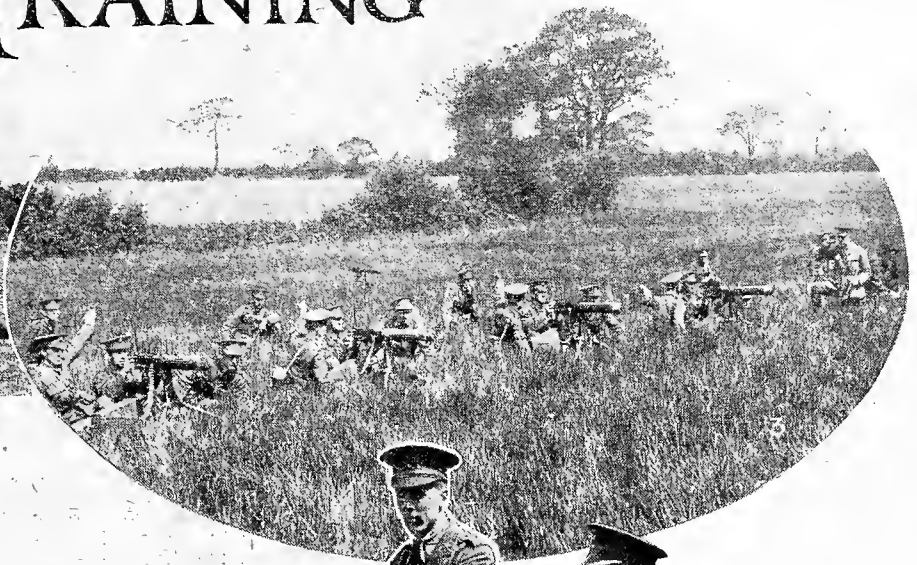
(2.) Swedish drill to get the men into shape.  
(5.) Spotting on the range.  
(8.) A refreshing wash after a day's work.



# TION in TRAINING



of camp life at the headquarters of the corps. This section is of recent formation. War Office decision, was transferred to Gun Service. In the H.S., M.G.C. engineering knowledge, to enable them to operate a machine gun, and the operation of the vehicles propelled by motive power.



- (3.) Machine gun practice on the range.  
 (6.) Two officers of the H.S., M.G.C., formerly connected with *The Motor Cycle*—in the sidecar, Capt. A. J. Palmer; and driving the Matchless, Sec.-Lt. H. B. Elliott.  
 (9.) Daimler lorries and their drivers attached to the Heavy Section.



# HIGH SPEEDS IN AUSTRALIA.

A 200 Miles Road Race won on a British 3½ h.p. Single-cylinder Machine at an Average of 50 m.p.h.

AN important road race was run in Victoria, Australia, on Easter Monday last, and the results aroused world-wide interest by reason of the big entry list and the very high speeds accomplished. It may be as well to state at the outset that the patriotic carnival, of which this 200 miles race was the chief feature, was held in aid of the local war funds.

The organisers were the Victorian M.C.C., and the course (which was 33.9 miles to the circuit) at Mortlake, 150 miles from Melbourne, was the same on which Erwin G. Baker made most of his records during his visit to Australia at the beginning of the year, including the twenty-four hours record of 1,028 miles 30 yards. The surface is very good, especially for a colonial road—the high speeds accomplished are some indication of that fact.

## England v. the U.S.A. in Australia.

There were sixty-one entries, and of these twenty-seven were riders of American machines. There was a good proportion of locally assembled machines fitted with European engines. The race being a handicap event, the first batch of three limit men was sent off exactly an hour in advance of the two scratch men—R. Finlay (7 h.p. Excelsior) and J. Booth (7 h.p. Indian). These two are leading Victorian riders, and the entry list contained the names of all the local

experts and several from the neighbouring States.

A keenly contested race, full of incident as motor races usually are, resulted in a win for A. Watts (3½ h.p. Rudge Multi), who rode a remarkably fine race. His luck was in, too, for his machine ran consistently throughout. This British success against such a strong American element is noteworthy, especially in view of the efforts for British overseas trade that the Americans are now making. At the same time the following results indicate that the American machines showed up prominently:

	H'p.	Actual time.	Average speed m.p.h.
1. A. Watts (3½ Rudge)	.. 50m.	4h. 4m. 27s.	49.9
2. N. H. Duckett (7 Indian)	.. 9m.	3h. 40m. 42s.	55.2
3. R. Dawson (7 Indian)	.. 9m.	3h. 49m. 37s.	53.1

## Records Lowered.

The high speeds will be noted, many new records being claimed. Watts's time for the first 101.7 miles was 2h. 2m. 54s., equivalent to approximately 100 miles in two hours, which is claimed as an Australian record for a machine under 600 c.c. Duckett accomplished the fastest time, averaging over 55 m.p.h.

In the unlimited class, H. A. Parsons (7 h.p. Harley-Davidson), by covering the first 101.7 miles in 97m. 20s., broke the road record for that distance. The record formerly stood at 108m., this time

being made by K. Walker on an Indian in 1914. Erwin Baker, when putting up his twenty-four hours record on the Mortlake course a few months ago, covered the first hundred miles in 110 minutes. Parsons put up a splendid fight, and chased Watts home, until, in the last lap but one, a broken inlet dome put him out of the running.

In connection with this world's record for 100 miles, it is as well to bear in mind that there are no officially recognised speed records on the road in England, for obvious reasons. Further, comparisons with times made in the Isle of Man races are not possible, by reason of the totally different nature of the courses.

Watts, the winner, stopped twice for petrol only. His Rudge was fitted with a Pedley belt.

## A RELIABILITY TRIAL.

In the 150 miles run to Mortlake from Melbourne, for the 200 miles race described above, the Victorian M.C.C. took advantage of organising a reliability trial, the start being from the Victorian capital at 9 a.m. on Good Friday morning. The results of this trial are appended:

SOLOS UNDER 600 c.c.  
T. B. Murphy (2½ Douglas) } Tie.  
T. Purves (2½ Douglas)  
SIDECARS UNDER 1,000 c.c.  
A. J. Sutherland (3½ P. and M. sc.)

# FILLING UP THE PETROL CENSUS FORMS.

## Some Points which have Puzzled Riders.

SINCE our last issue was published the Petrol Census has come and gone. The announcements were made in the daily papers only, and the technical press, which is read by the majority of, if not by all, motorists was ignored. This was a pity, as many of our readers required advice and enlightenment on the subject of the forms. There are always many little difficulties, which crop up in the filling of official papers, very puzzling to the average man, and it seems to us that these Government papers are frequently drawn up without any help from experienced men. For instance, how was the man who has not ridden during the present year, but has a mount on order, to fill up his form? He has no registration number, no average for the three months ended April 30th, and his estimated requirements must be the merest guesswork. Another point! It is stated that any person knowingly making a false entry will be guilty of an offence involving a heavy penalty under the Defence of the Realm Act.

The R.A.C. has issued a notice stating that it is most important, in the interests of motorists, that the requirements should not be overstated. This, however, reached us only the day before the census closed, and

we were in consequence unable to make it serve any useful purpose.

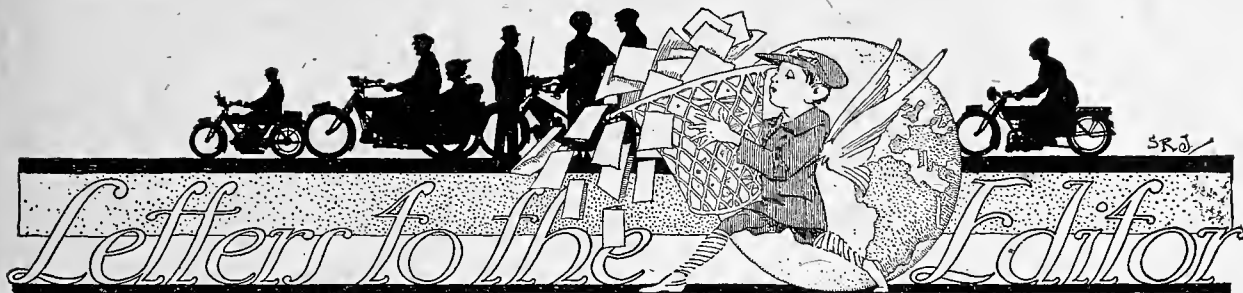
The supply of forms was in some places used up on the day of issue—personally we had to apply three times before obtaining one—but whether this was due to the authorities having failed to estimate correctly the number of

motorists, or to the forms being given away indiscriminately to all who cared to ask for them, we are unable to state.

We learn, as we go to press, that forms from those who were unable to obtain them at first will be accepted for the next few days. The reason for the delay should be stated.

Particulars required to be supplied on or before the 20th day of June, 1916, by any person using or keeping motor spirit for the purpose of supplying motive power to motor cars (other than hackney carriages) and/or motor cycles in respect of which full licence duty is payable.					
Name _____		County _____			
Address _____					
Registration Number(s)	State in each case whether Motor Car(s) or Motor Cycle(s)	Average consumption of motor spirit per month during the three months ending 30th April, 1916.	Present stock of motor spirit.	Estimated requirements of motor spirit per month until the end of 1916.	Purposes for which each vehicle is used
I certify that the above statement contains a full and true account of the particulars required +					
Signature _____				Profession or Occupation _____	
Date _____					
<b>Petrol Form 1.</b> <small>* Motor spirit knowingly making a false entry in this return will be guilty of an offence involving liability to heavy penalties under the Defence of the Realm Act.</small> <small>* Medical Practitioners should fill in Petrol Form 2.</small>					

THE PETROL CARD.—Form No. 1 is shown above for use of owners of cars and motor cycles on which tax has been paid.



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address

#### Naphtha as a Fuel.

Sir,—Naphtha is no doubt an excellent fuel in many respects, but a certain amount of acid is produced by its combustion, and the action of this acid on the lubricating oil and eventually on the cylinder walls is likely to cause a great deal of trouble.

I have spent a great deal of time experimenting with various fuels, and am very much afraid that neither naphtha, nor mixtures of paraffin and petrol, nor the addition of higher hydrocarbons to petrol, brings us much nearer to the solution of the fuel problem. I believe it is quite possible to "doctor" paraffin to give quite excellent results, but I understand that the same benefactors who control the supply of petrol also control the supply of paraffin. I have been running on a mixture containing 75% of paraffin for some time, but if everyone did the same I am afraid the price of paraffin would go up.

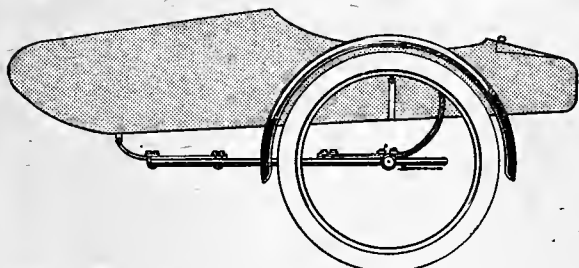
H. W. KILBY.

#### The Distribution of Weight in Sidecars.

Sir,—I thoroughly appreciated "H.M.B.'s" article on "The Risks of Imperfect Alignment" in your paper of May 25th. The alignment of the usual "Bank Holiday outfit" is enough to make a sane motor cyclist sick, but the actual distribution of the weight of the sidecar body itself as delivered by the manufacturer is enough to make him still more sick.

Look at any modern sidecar—the luxurious heavyweight usually attached to an unfortunate "3½" is the worst offender—and you will see that, when the passenger is comfortably seated, the centre of weight of the sidecar body comes about a foot in front of the sidecar axle, causing a large proportion of the weight to be supported by the unfortunate, and usually bent, front sidecar stay. This stay, in turn, hangs heavily on the head lug of the machine, which, especially in a "bent top tube" frame, has a good many strains to resist already.

Another point: What is the usual trouble with sidecar machines when hill-climbing? Answer: Back wheel slip. And to counteract this the passenger usually puts as much of his weight as he can on the carrier of the motor cycle.



Sidecar body built at home by Messrs. Addenbrooke and Corke.

Now, if the sidecar had its centre of weight directly over the back axle, all the weight of the passenger would be on the two back wheels, and if he leaned over it would put all his weight on the driving wheel.

I have seen enough sidecar chassis bent down in front to convince me that there must be great strains due to this incorrect distribution of weight.

Last vacation a friend (Mr. J. F. Corke) and myself built a sidecar body of sheet metal, and attached it to the chassis

in such a way that when the passenger is seated and some tools (an ordinary outfit) placed in the tool locker behind the seat (and accessible without disturbing the passenger) it is perfectly balanced about the point where it is fitted to the main C springs, and this point comes perpendicularly above the axle.

Back wheel slip is unknown, and there is no strain on the head lug. I enclose a sketch of the sidecar.

H. ST. V. ADDENBROOKE.

#### Touch Wood!

Sir,—Referring to "Military Cyclist's" account of his near squeak with a tramcar coming down Cemetery Hill, Chatham, can he tell us how much "lean" it took to bring the sidecar wheel twelve inches off the road level on to the kerb, what it felt like steering his outfit while running in such a position, and how much of the tramcar they cut away so that the requisite amount of "lean" could be indulged in?

We should like to know the above for future reference, because under similar circumstances we should have "leaned" away from the car, bringing the 5-6 h.p. Indian off the road, run along on the sidecar wheel, when safely past returning to our normal position, and right away without a scratch.

We submit our method as an alternative to our friend's, and leave it to any of your readers who may find themselves in similar circumstances to choose which to take.

OLD KNOCKALONG.

#### The Highest Point in Sussex.

Sir,—May I be permitted to add yet another word of correction on the subject of the "Highest Point in Sussex," first raised in your contributor's very readable article "Peace—and War" in your issue of May 25th, and the reply thereto of "Son of Sussex" in the issue of June 8th?

In this latter your correspondent suggests Ditchling Beacon as holding the "topmost place," and gives as his authority Black's "Sussex." I am afraid he has not dipped into the subject quite deeply enough, for if he will turn up the same authority again he will find Blackdown Hill 918ft. quoted as the actual "highest point." Next to this comes Duncton Beacon 837ft.; then follow Linch Ball 818ft., Chanctonbury Ring 814ft., Ditchling Beacon 813ft., Elstead Beacon 795ft., and then Crowborough Beacon 792ft.—a bad seventh on the list.

I have consulted several guides, etc., on the subject, and unquestionably Blackdown Hill is the highest point of our charming county of Sussex.

J. S. ARNOLD.

#### The Running of Two-strokes.

Sir,—I have watched with great interest the recent correspondence in the columns of *The Motor Cycle* on the overheating of two-strokes. The phrase "overheating of two-strokes" implies subtly that these machines are very prone to overheating, and, moreover, do it because they are two-strokes! I venture to assert that a carefully designed and efficiently oiled engine of this type will overheat no more than a four-stroke engine; and also that the majority, if not all, of the drawbacks raised against two-strokes are nebulous bogeys—or at least need be nothing more!

Take the overheating about which discussion has been going on in your columns. "Ixion" wrote that his baby two-stroke nearly welded its piston to its cylinder in climb-

ing a certain test hill. Assuming that the lubrication is not to blame, the responsibility for this must be due to engine design if the machine was properly driven (as no doubt it was). Otherwise *all* two-strokes would do the same!

My machine is a  $2\frac{1}{2}$  h.p. Velocette, and neither with this nor with one of the same make which I previously owned have I ever experienced overheating, although much of my riding has been done over hilly country.

This I attribute largely to the ingenious system of lubrication which the designer has incorporated with the Veloce engine, by which oil supply is automatically regulated by engine speed, less at low speeds and proportionately more at higher speeds. The oiling is taken out of the rider's hands and entirely works itself, as long as the sump contains oil. But this result is also, I believe, largely due to the cunning of the designer. Two-strokes need not overheat!

Another bogey is the common belief that such engines are extravagant with petrol. But the fact that a carefully measured gallon has just taken me 155 miles, by speedometer, over give and take roads on this machine (my weight being about 11 stone) shows that an efficient two-stroke engine can be extremely economical. I believe that I can get a better mileage even than this after a careful tuning up, and I intend to try it.

Four-stroking at low speeds (another needless phantom!) does not necessarily occur in two-strokes. I can drive at any speed from 4 to 37 m.p.h. two-stroking sweetly.

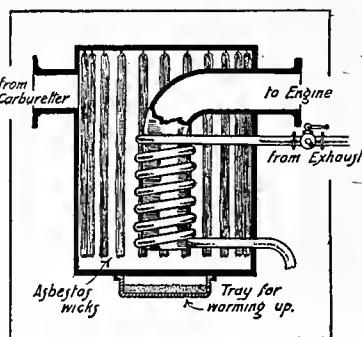
May I add that, in my belief, all these ills from which many motor cyclists sincerely believe all two-strokes suffer are matters arising from design of engine, and I believe that with a suitable design they are non-existent.

I must conclude by saying that I am entirely unconnected with the motor cycling industry, and have no interest whatever in the subject except from the position of a practical two-stroke rider.

R.L.H.C.

### Paraffin as a Fuel.

Sir,—With petrol soaring to its present price, the use of paraffin for motor cycles becomes an absolute necessity. Already the modern machine has proved itself capable of running fairly satisfactorily with paraffin, although carburetters are at present designed for spirit only. The great fault of the modern carburetter is that it does not vaporise the fuel sufficiently, and I append a rough sketch showing an additional vaporiser that could be easily fitted to an ordinary jet carburetter, the idea being that the present carburetter should proportion its fuel and air correctly, while the extra vaporiser would guard against liquid paraffin being drawn into the cylinder. The deterioration of the lubricant is noticeable when starting a machine with a big jet on petrol, and, of course, with paraffin it is additionally so, as less fuel is vaporised. The principle is clearly shown by the diagram. It consists of a circular cylinder holding a supply pipe from the carburetter. A central pipe is fitted, surrounded with a coil of pipe heated by the exhaust. This central pipe supplies the engine. Asbestos wick is hung round the space to provide extra vaporising area. Underneath there is a small tray to hold a small quantity of methylated spirit, to warm up before a start.



Contrivance to vaporise paraffin. (See letter from H. E. Rendall.)

The principle is clearly shown by the diagram. It consists of a circular cylinder holding a supply pipe from the carburetter. A central pipe is fitted, surrounded with a coil of pipe heated by the exhaust. This central pipe supplies the engine. Asbestos wick is hung round the space to provide extra vaporising area. Underneath there is a small tray to hold a small quantity of methylated spirit, to warm up before a start.

H. E. RENDALL.

Sir,—I note in last week's *Motor Cycle* a letter embodying the suggestion that vaporisation might be effected by means of a fine mesh of platinum wire gauze heated by an electric current. I hasten to write this, trusting it will be in time to prevent anyone putting this into practice, and the fire

B18

which would most certainly result. What ever other wire may be used, platinum should most certainly *not* be used, for the metal has a certain physical peculiarity known to chemists as occlusion of gases: the surface appears to absorb certain gases in considerable quantities, or in an altogether special molecular condition, which enables chemical combination to take place in a most intensive fashion.

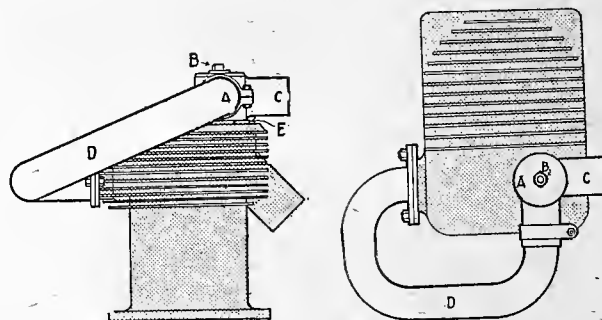
For example: A piece of thin platinum foil and an ordinary laboratory Bunsen gas burner will demonstrate in place of carburetter and platinum gauze. The burner is a carburetter, and if the gas be turned on without lighting the burner, and the platinum foil (heated elsewhere to just a dull red, or barely red) be then held in the issuing mixture of gas and air, the metal will begin to glow, rise to a bright red, and in a very few seconds will light the burner!

Further comment is needless. This property of occlusion of gases (anyway to a marked extent) is not common amongst metals, and the proposed heated gauze experiment could be carried out with most ordinary wires, but not with platinum.

(REV.) F. C. LEES.

Sir,—Knowing you are interested in the use of cheap fuel for motor cycling, I send a description and rough sketch of a vaporiser to burn paraffin I have patented and fitted to my  $\frac{3}{4}$  h.p. single-cylinder motor cycle.

The vaporiser A is fitted on the top of the exhaust valve cap E and held down by a central stud B. It has an inlet



C for carburetter attachment, and an outlet for copper pipe D conveying the vapour to the inlet of the cylinder.

It will be seen that this vaporiser will fit nearly any machine, with little alteration and using the same carburetter.

Previous to fitting the vaporiser I ran about 400 miles on half paraffin and half petrol (my carburetter being supplied with hot air), but I found that the paraffin worked its way past the piston, with bad results to the bearings, but there is no trace of paraffin passing the piston when using the vaporiser. I have run about 360 miles on paraffin alone, pulling a heavy sidecar, the average consumption being from sixty to seventy-five miles per gallon, the price of this being 1s. against 2s. 9d. if I use petrol.

FRED WALKER.

Sir,—The following may be of interest to your correspondent Mr. H. A. Bromley.

Some years ago I tried some experiments with hot wires in the induction pipe of an old twin Rex, accumulator ignition, and B. and B. carburetter. The arrangement had the following disadvantages:

1. When warm the wires, of course, became slack, and there was a tendency to "short" and set fire to the carburetter.
2. It took a fairly heavy current to keep the wires warm enough to do any good.
3. The warmer the mixture, the less you get into the cylinder per stroke. This, of course, also applies to a warm-air inlet.

Much better results were obtained with a small coil of wire wound round the jet, and I am thinking of resuming experiments in this direction now, though not with electricity. Some of the old carburetters, I remember, had exhaust jackets round the base of the jet, and I have often wondered why these were discarded.

J.M.N.

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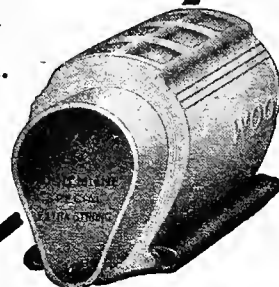
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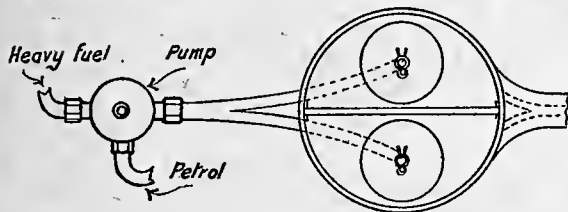
THEREFORE WRITE US NOW AND

**SAVE MONEY.**

Address all communications to—

**The ZILLA PATENT BELT COMPANY, Ltd.,**  
101, Great Western Street, MANCHESTER.

Sir,—I am sending you a rough sketch of a fitment I made some three or four years ago, which I used for running on petrol and paraffin. At that time the usual procedure



**Double Float Chamber**

Double float chamber design by J. McLellan.

was to unscrew the union to the float chamber and run the paraffin off, unless one had run it off some time previous to stopping, which in nearly every case I forgot to do, and then to fill in the petrol at the top of the chamber. You

see I did not have a spare tank, but carried the petrol in a bottle in my pocket. You will see that by turning off the paraffin tap and pulling the pump handle the float chamber is emptied, when the three-way tap is turned on for the petrol to fill up the chamber, or such quantity as is desired.

I made my pump out of an old inflator, which acted very well.

I thought perhaps some other reader would be glad of the suggestion, seeing petrol is so dear, and there are cheaper fuels on the market. I should say it would be just the thing for fitting to a Binks when using his fuel, and when easy starting is wanted.

JOHN McLELLAN.

#### Piston Tap or What?

Sir,—I, too, would like to give you my experience. My machine was a 1915 (August) 5 h.p. Indian, which, I might say, gave me the greatest satisfaction, being always extremely easy to start, very flexible, and would do 65 m.p.h. on the road. However, after running it for about 4,000 miles under very trying conditions, I noticed the same knocking, or tapping, that your contributor mentions. At first I put it down to excessive tappet clearances, but after very carefully adjusting these, I found no appreciable difference. Then I found that my front chain was slack, so I tightened it, and found that the tapping was ever so much better, but was, nevertheless, quite noticeable when running on pilot jet slightly up hill and on full advance. So I finally took the engine down, but at first I quite failed to find any cause. The big ends were perfect and the small ends were quite tight. Finally I removed the rings from the pistons and tried the fit in the cylinders, and I found that the back piston was quite slack in the cylinder, which, I presume, was the cause of the knocking referred to. The reason for the back wearing more than the front I attribute to the fact that the oil from the mechanical pump is all led to the front cylinder, and on one occasion I ran the machine short of oil, and so the small amount of oil that did reach the engine went to the front cylinder, and, in consequence, the back cylinder got practically none. I got rid of the machine after that in exchange for an 8 h.p., but for the 5 h.p. Indian as a solo mount I have nothing but praise.

D. W. CARTER.

#### A Trip to Imbros.

Sir,—Just a few remarks on a letter published by you in your issue of April 27th from P.O. G. L. Rossiter, R.N.

armoured cars, in which the following appears: "A little trip across the water to Imbros, in November, gave me an opportunity to try a Clyno outfit, which was being used as a sort of speed delivery van for aeroplane spares, mails, and, in fact, any old 'clobber.' It was a great joy to ride something with two fairly hefty cylinders on some sort of a road."

Now if your correspondent can let us know when he experienced that "great joy" we should be extremely interested, as at the time to which he refers we were in charge of the Clyno outfit mentioned in his letter, and can vouch for the fact that up to January 25th no one but ourselves, and very occasionally one officer, ever drove that 'bus, so you will see that he is possessed of an unusually vivid imagination.

We never find your excellent paper anything but instructive as well as amusing. It is in great demand here among the devotees, as everywhere else, and regularly goes the rounds every week.

May we ask you to do us the favour of publishing this correction?

W. W. MACONNACHIE.

L. MATHISON.

G. P. OSBORNE.

Nudros.

#### Foot Control of a Countershaft Gear.

Sir,—I have before me a copy of your most excellent paper, which is read from cover to cover by most D.R.'s out here.

I should like to pass a remark on an article, published in the issue of *The Motor Cycle* for June 1st, re the re-adjustment of gear control from hand to foot on the countershaft Triumphs.

The point I wish to impress is that this idea has come very late in the day. The D.R.'s of this Division, when being fitted out at Leamington, were the very first to receive countershaft Triumphs, in February, 1915, actually going to the Coventry works and riding them away; and before we left on "active service" in March, 1915, the majority had adopted the foot control, making precisely the same alterations as illustrated in the article from the Frenchman.

On arriving in Egypt, and later on at Gallipoli, we found that this alteration was essential, as it was impossible to let go the handle-bar in order to change gear.

I might add that our D.R.'s were the first motor cyclists to land on, and the last to leave, the Peninsula, and there are still ten of the "Old Guard" out here; two of those, after fifteen months' "active service," have not yet caught a glimpse of dear old "blighty."

Our praise cannot be too high for the trusty Triumph; its durability is marvellous.

E. BECK (CPL.).

Div. Signals, B.E.F.

[The question of foot control for countershaft gears received attention in *The Motor Cycle* some time before the description of the French Army motor cyclist's adaptation which appeared in our issue of June 1st. Nevertheless to Cpl. Beck's section must be awarded the credit for the first alterations effected.—ED.]

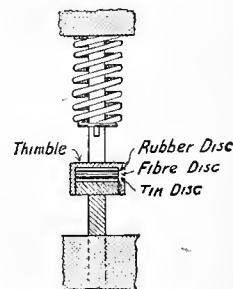
#### The Noise of Valve Gear.

Sir,—I was interested to see in your edition of March 23rd a description of a "Bundobust" to reduce noise and wear on valves, tappets, etc. I tried a similar arrangement to that described by your correspondent, but found it unsatisfactory, and I finally evolved the following (probably it is not original) fixture shown in the sketch, which may prove useful to your readers.

Essentially it consists of a thin case-hardened thimble fitting closely on the top of the tappet, and in between the two are packings of rubber, fibre, and, finally, tin discs. The rubber should be soaked in oil till it gets into a semi-liquid state. The arrangement is of particular value in non-adjustable tappets; also there is absolutely no necessity to have any clearance whatsoever between valve and tappet.

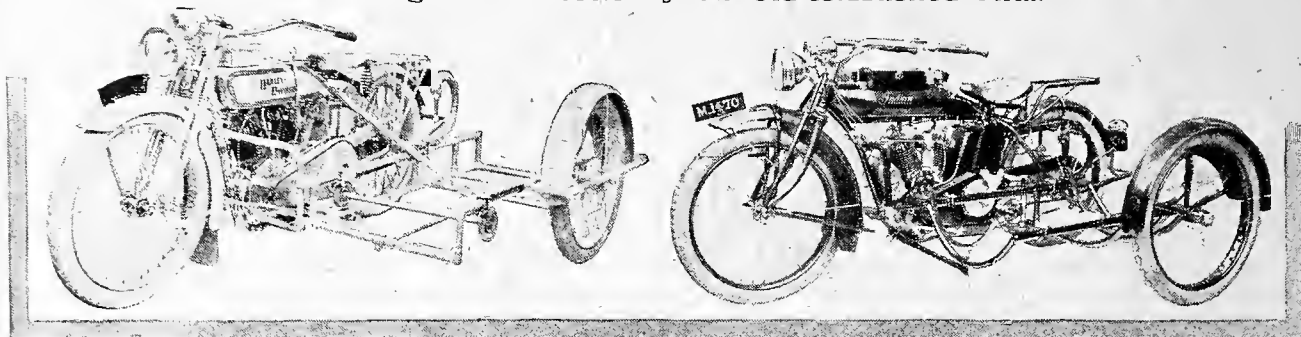
Punjab.

E. COX.



## PHENIX SIDECARS.

Well-thought-out Chassis by an Old-established Firm.



Examples of Phoenix sidecar chassis. That on the right is specially built for use with spring frame Indian models.

**T**HE manufacturers of the Phoenix sidecars were among the pioneers of the motor cycle industry, the founder of the business being Mr. J. Van Hooydonk, who is still a prominent member of the Motor Cycling Club, though his firm no longer makes motor cycles. The works where Phoenix sidecars are constructed are those in which the early Trimo first saw the light in 1902.

One of the first models which we inspected was a large double-seated sidecar which will take two adults. The backs of the seats are well upholstered, and a door is fitted to the front, there being also a space left under the front seat to provide room for the feet of the occupant of the back seat. This sidecar has a drop frame, and is designed to be

attached to the machine at four points. The body is carried on C springs provided with long shackles, the frame being stayed by four cross-members stiffened by a longitudinal backbone. The wheel hub is of large size. It is interesting to note that this sidecar is guaranteed to carry 40 stone.

### A Spring Frame Model.

Another speciality is the Phoenix Model 190, designed for the spring frame Indian. A special form of attachment is supplied to render it suitable for this particular make, it being attached at the rear to a lug under the saddle, and also to the bottom of the seat post under the accumulator box. It is fixed at two other points to the machine. The chassis is built throughout of the best weldless

12-gauge steel tubing, and is provided with heavy lugs. The tyre is a 28 x 3in.

There was also shown to us a model specially intended for Harley-Davidson motor bicycles, the chassis of which is provided with a large luggage grid behind. The 28 x 3in. wheel is enclosed, and a withdrawable spindle is fitted to the hub so that the wheel can be easily detached in the case of a tyre repair being necessary.

Altogether Phoenix Motors, Ltd., have about 100 sidecars in stock, and many of these being different models, the customer has ample choice. The workmanship is good, and the sidecars are thoroughly practical vehicles of excellent design. Numerous examples fitted with box bodies are used by tradesmen for the delivery of goods.

### A NOVEL MAGNETO.

**A**mericans are nothing if not enterprising, and no doubt a desire to strike something original in the magneto line has led to this, the latest feature of the Schickel lightweight—a small two-stroke, which has a considerable sale in the States.

Following on the lines of the Ford flywheel ignition device, the Schickel Motor Co. has produced a magneto which is enclosed in, and forms part of, the outside flywheel. Attached to the

case, and rotating the plate slightly. A small inspection hole in the wheel, with a movable cover, is intended to allow examination of the contact points. It is certainly a novel idea, but whether it is a step in the direction of the perfect magneto remains to be proved.

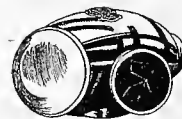
### THE MUSTIKON PATCH IN USE.

**S**INCE describing the Mustikon repair outfit we have carried one of these with us on every machine we have driven in the meantime, but until the other morning it acted as an exceedingly good mascot, and the only tyre trouble we had experienced was a leaky tyre valve.

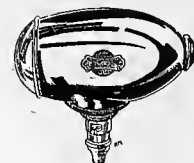
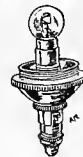
However, when out for a ride recently we found that we had to take out the tube within two miles of the start, and discovered an excellent puncture with which to experiment. This was a pin projecting about 1/16 in. through the tube. Following the instructions given with the Mustikon outfit, we took the scissors supplied and neatly cut a small hole in the tube. We then turned to the solution tin, only to find it dry. Fortunately, the machine was supplied with another outfit, so we dipped the mushroom patch in the solution belonging to this, and after two attempts had no difficulty in inserting it in the hole. In a few minutes the outfit was packed up, and a beautiful repair made, which, up to the time of writing, has given no trouble, and we expect none either.

### TWO GOOD ELECTRIC LAMPS.

**M**ESSRS. BLERIOT, of 53, Long Acre, W.C., have recently placed on the market excellent side and tail lamps for use on the high-class sidecar combinations which are provided with electric lighting. As one would expect from so famous a firm, the workmanship

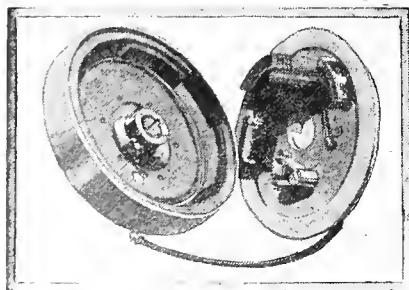


Bleriot side and tail lamps for electric outfits of passenger motor cycles.



and finish are of the highest quality, while the same may be said for the solidity of the lamps, the metalwork being substantial and strong.

The tail lamp is shown with the bulb withdrawn, indicating the size of the screw which enables one to obtain a good grip of the holder for the purpose of removing the bulb. Owing to the large size of the orifice the interior of the lamp is easily cleaned. As will be seen from the illustrations, the lamps are neat in outward appearance, and have no projections to make cleaning difficult.



An American magneto contained in the outside flywheel of a two-stroke lightweight.

inside of the rim of the wheel are a pair of permanent magnets. On a plate, fastened to a boss on the crank case, are carried the armature coils, contact breaker, and the condenser.

Timing is effected by loosening the clamps attaching the plate to the crank

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26×2½ Standard .....	14/6	23/9
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28×2½ " .....	17/6	27/6
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26×2½ Model de Course .....	18/6	33/3
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26×2½ L'weight T.T., basket patt. ....	12/6	21/-
26×2½ T.T., basket pattern .....	17/6	28/-
26×3 for 2½ " " heavy .....	22/6	37/9
26×2½ " " " heavy .....	21/6	34/-
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650×65 Autobi .....	22/-	39/6
650×65 Fluted pattern .....	18/-	28/-
650×75 or 700×80 Autobi ruh. stud. ....	27/6	44/3
<b>650×65 Heavy Fluted ..</b>	<b>19/-</b>	<b>33/-</b>

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26×2½ De Luxe .....	17/6	32/-
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26×2½ Dreadnought .....	27/6	40/-
26×2½ " .....	32/6	40/-
26×2½ A Won, rubber-studded ..	19/6	32/-
26×2½ " .....	22/6	32/-
26×2½ " ribbed .....	14/6	27/6
26×2½ B quality, rubber-studded ..	13/6	26/6
26×2½×2½ De Luxe, extra heavy ..	25/-	36/6

**COVERS.**

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<b>KEMPSTALL.</b>		
26×2½ Heavy Anti-skid .....	22/6	32/6
26×2½ " Non-skid .....	30/-	—

**WOOD-MILNE.**

26×2 Grip-ribbed, heavy .....	15/9	26/9
26×2 " extra heavy .....	20/9	32/-
26×2 Combination, heavy .....	21/-	39/-
26×2 " extra heavy .....	24/6	45/-
26×2½ Grip-ribbed, heavy .....	17/6	29/-
26×2½ " extra heavy .....	22/6	36/-
26×2½ Combination, extra heavy .....	29/6	48/6
26×2½ Grip-ribbed, heavy .....	17/6	30/6
26×2½ " heavy .....	22/6	32/9
26×2½ (for 2½ rims) " extra heavy ..	27/6	40/-
26×2½ " Combination, heavy .....	30/-	48/-
26×2½ Grip-ribbed, heavy .....	20/-	31/6
(for 2½ rims) " extra heavy ..	25/-	39/-
" Combination, heavy .....	28/6	46/6
" " extra heavy .....	32/6	55/-
26×3 Grip-ribbed, heavy .....	21/-	36/6
(for 2½ rims) " extra heavy ..	26/-	44/-
28×2½ " heavy .....	16/6	31/9
28×2½ " extra heavy .....	21/-	39/-

**HUTCHINSON.**

28×2½ Passenger .....	29/6	45/-
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28×3 " .....	9/6	13/-

Butted, 1/- extra.

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24×2 " .....	3/9	6/6
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¾ in. " .....	"	1/- 1/11

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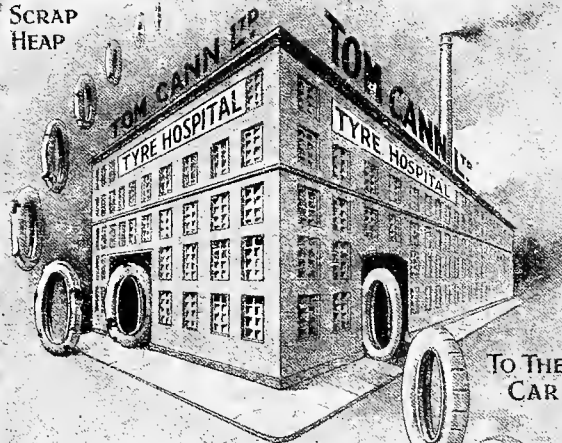
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## MOTOR CYCLES FOR SALE.

## Bat.

6 h.p. Bat-Jap, 1913, 2-speed countershaft, chain drive, K.S., Gloria C.B. sidecar, spares, and accessories, O.K. condition; £38.—Dana, Brooklands, Dawley Rd., Harlington, Middlesex. [X2273]

1914 Bat-Jap, 6h.p., Swan 16 gn. sidecar, new back tyre, lamps, horn, speedometer, spare tyre, all grey; owner joined up; 50 gns.—308; Upper Richmond Rd., East Sheen. [7125]

## Blackburne.

BLACKBURNE, 1914, 3-speed, 3½ h.p., handle-bar clutch, just re-enamelled; 37 gns.—Troward, 78, High St., Hampstead. Phone: 5392. [7231]

## Blumfield.

BLUMFIELD, twin, 3½ h.p., single-speed, very fast; £17.—21, Tidal St., Chelmsford. [6977]

## Bradbury.

BRADBURY, 1913, 4h.p., 2 speeds, free engine; £24.—Dunstan, West End, Haynes, Bedford. [6965]

1912 Bradbury, 2-speed gear, capital sidecar machine, good accessories; £21.—Bunting, Harrow. [7145]

1913 4h.p. Bradbury and nearly new Comfy sidecar, N.S.U. gear, must sell. £27.—Walby, 21, Cantwell Rd., Plumstead, Kent. [X2206]

BRADBURY, 1913, 4h.p., coachbuilt sidecar, 3-speed clutch, electric lighting, perfect condition; 35 gns.—Sindrey, 1a, Sudely St., Islington, N. [6966]

4 h.p. Bradbury, 1912, new piston, practically new tyres, Bosch, plating unscratched, grand puller; £22.—Clark, Garage, Long Melford, Suffolk. [7088]

BRADBURY, 1914, 6h.p., sidecar, perfect condition, mileage under 4,000; £55, or nearest.—Burnet, 2, Blinkbonny Crescent, Edinburgh. [7176]

BRADBURY 4h.p. 1912-1913, new cylinder, piston, valves re-bushed last month, good tyres, accessories, tools; bargain; £24; after 6 p.m.—15, Florence St., New Cross, S.E. [6991]

1911 3½ h.p. Bradbury, 2-speed, and F.E., good condition; £18, or exchange with cash for Triumph, or Zenith-Gradua.—Stenhouse, Ironmonger, Southampton, Dumfriesshire. [X2204]

1914 Bradbury, 4h.p., 2 speeds, kick start, and hand control clutch, with coach sidecar; £38, or exchange Indian or 8h.p. Bat.—McLoughlin, St. John's College, Oxford. [X2247]

1912 Bradbury, 2-speed, speedometer, lamps, 2 belts, all accessories, and 1913 coachbuilt Milford sidecar, all in magnificent order; £27; any trial.—Ellis, 205, Spring Hall Lane, Halifax. [X2360]

BRADBURY, 1913, with sidecar, 4h.p., Bosch, 2 speeds (new tyres all round); 28 gns.; exchanges; easy terms arranged.—Wandsworth Motor Exchange, Ebner St., Wandsworth Town Station. [X2254]

## Brown.

BROWN, 2½ h.p., 2-stroke, 1915 model; £12.—Good-mao, Blethley Rd., Bucks. [X2364]

1913 3½ h.p. Brown, mag., adjustable tappets, perfect condition; bargain, £16.—Blake, 218, Westbourne Grove. [6874]

BROWN, 3½ h.p., and sidecar, 2-speed, in good order; £25; easy payments arranged.—Jones, Garage, Broadway, Muswell Hill. [6239]

## B.S.A.

B.S.A., new 1916 models H and K in stock, no waiting.—Moss, Wem. [X2377]

1912½ B.S.A., 2-speed, free engine; £25, cheap.—7, Woburn Place, W.C. [6936]

COLMORE Depot, 261, Deansgate, Manchester, for immediate delivery of B.S.A. [0798]

B.S.A. Models H and K in stock; immediate delivery.—Colmore Depot, 261, Deansgate, Manchester. [6024]

B.S.A., 1913, 3½ h.p., clutch, with wicker sidecar, new tyres, lamps, horn; £30.—Pendennis, West Byfleet. [X2367]

NEW 1916 (June) B.S.A., 3-speed model H; joining up; accept nearest £64.—19, Mountfield, Prestwich. [X2325]

B.S.A., 4½ h.p., 1916, chain, 3-speed, just delivered, run 50 miles; £58/10.—Capt. Ellis, Conaty Stand, Dooceaster. [X2212]

B.S.A. Model H and No. 2 sidecar, both actually in stock; £82/18; first cheque secure.—Hucklebridge, 133, Sloane St., London, S.W. [X2299]

B.S.A., 1915, model K, 4h.p., 3-speed, chain-cum-belt, one of the hard-to-get machines; £43, bargain.—Layton's Garage, Bicester, Oxon. [X2394]

B.S.A., 1916 models in stock, also B.S.A. sidecars; exchanges or extended terms quoted.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0491]

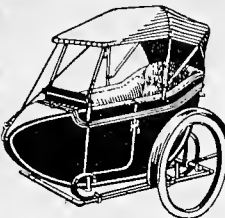
B.S.A., 4½ h.p., 1916 K models in stock, chain-cum-belt, 3-speed, kick-starter; £62; exchanges or deferred payments.—Eagles and Co., High St., Acton, W. [X2291]

1914 (November) 4h.p. Chain Drive B.S.A., 3 speeds, countershaft, machine in perfect condition, also tyres, mileage under 4,000, Lucas £3 lamp, horn; bargain, £37/10.—John Hill, Ledbury. [6973]

B.S.A., late 1915, 4½ h.p., chain drive, countershaft 3-speed, clutch, kick starter, Dunlops, ridden under 350 miles, as new; £50; seen in London, or at 87, Thornbury Rd., Osterley, Isleworth, W. [7192]

## CORONET SIDECARS.

We are building special models for Harley-Davidsons, Excelsiors, and Indians, enamelled either grey or red to match machines, and fitted with 28x3in. tyre and four point attachment.



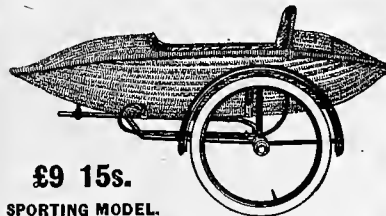
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## CASH OFFERS WANTED.

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1916 ditto, electrical model ..... £89 0  
7-9 h.p. INDIAN, 1915, electric model, with Milford £18 rbs. Sidecar, screen ..... £75 0  
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2½ h.p. WOLF, 1916, 2-stroke, 2-speed ..... £33 10  
20 h.p. FORD Van, new, 1916 model ..... £130 0  
20 h.p. FORD Van, 1915 model ..... £90 0  
6 h.p. REX, 1912, 2-speed model ..... £25 0  
11 h.p. TYLER, 1915, 2-speed model ..... £21 15  
3½ h.p. TRIUMPH, 1910 model ..... £18 15  
3½ h.p. LINCOLN-ELK, 1912 model ..... £14 15  
5 h.p. INDIAN, 1915, 3-speed, finished red, beautiful condition ..... £55 0  
2½ h.p. ENFIELD, 1912, 2-speed ..... £15 15  
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11 h.p. WOLF Lightweight, 1912, magneto ..... £6 15  
3 h.p. Machine with P. & M. engine ..... £2 15  
3 h.p. LINCOLN-ELK, 1911, magneto ..... £12 15  
3½ h.p. TRIUMPH, 1911, 2-speed model, with Sidecar, lamps, and horn ..... £23 15  
2½ h.p. PREMIER, 1912, 3-speed model ..... £20 15  
7-9 h.p. HARLEY-DAVIDSON, electrically equipped, complete with sidecar ..... £69 15  
3½ h.p. HUMBER, 1911, 2 speed ..... £17 15  
4 h.p. ZENITH, 1911, variable gear ..... £18 15  
1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn and lamps ..... £79 0

## MISCELLANEOUS BARGAINS.

New £5 Weatherproof Magneto, £3 10s.; B. & B. Carburetor, 12/6; Amac Carburettory, 12/6; Good complete Sidecar, £2 6; Burbury £13 Coach Sidecar, £6 5s.; Coach Cane Sidecar, £3 10s.; Coach Sidecar, underslung frame, £5 5s.; Wicker Sidecar, enclosed body, 42/6; Sidecar Chassis, with tyre, 27/6; Speedwell £14 Coach Sidecar, with screen, £7 10s.; Lightweight Coach Sidecar, new, £7 15s.; Jones Speedometer, 25/-; New Coach Sidecar Body, £3 5s.; New Sidecar Chassis, complete with all fittings, 65/-; 1916 Binks Carburetors (your old carburetor taken in exchange).

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## B.S.A.

B.S.A., models H and K delivered from stock, also 1914, all-chain 3-speed model, £42, also 1912 2-speed £30; generous deferred terms.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7036]

1913 3½ h.p. B.S.A. Motor Cycle, in excellent condition and running order, recently overhauled and fitted with new tyres; price £35.—For further particulars apply, J. S. Callow, 8, Maderia Av., Horsham. [7048]

## Burford.

BURFORD-VILLIERS 2-stroke Motor Cycle, 1915, as new; bargain, £23.—Bastone's, 228, Pentonville Rd., King's Cross, London, N. [7217]

## Calthorpe.

CALTHORPE-J.A.P., 2½ h.p., 2-speed, under 1,000 miles, equal to new; £28/10.—4, High Rd., Wood Green. [7050]

CALTHORPE Junior, splendid condition, very little ridden; £18.—Mehew and Bailey, Charlotte St., Hull. (D) [6946]

CALTHORPE Junior, 1915 model, run 800 miles, 2-speeds; as new.—Harford and Co., Station Rd., Canterbury. [6987]

CALTHORPE-J.A.P., 1916, 2½ h.p., 2-speed, only 4 months old; £30, or offer.—Lieut. Collett, 20th Welch, Kiamel Park, Rhyll. [6943]

1914 Calthorpe, 2-stroke, 2-speed, tyres in good condition; very great bargain, 18 gns.—Julians, Broad St., Reading. Phone: 1024. [X2413]

CALTHORPE, 2-stroke, 2-speed, unscratched, only ridden 192 miles; 26 gns.—Particulars, Rogers, Newington Terrace, Craven Arms, Salop. [X2356]

COLMORE Depot, 31, Colmore Row, Birmingham, have in stock all models of Calthorpes for immediate delivery; also at our Manchester Depot. [0799]

CALTHORPE, 2½ h.p. J.A.P., with Enfield 2-speed gear, brand new, shop-soiled only; list £36/15, accept £35.—P. J. Evans, John Bright St., Birmingham. [X2342]

CALTHORPE, 2-stroke, 1916, latest model, Enfield 2-speed gear, just arrived from works; £32/11.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7002]

CALTHORPE (December, 1915), 2½ h.p., 2-stroke, 2 speeds, free engine, almost new, complete with lamps, tools; £27.—Bernardos, 17, Ommanney Rd., New Cross. [7126]

CALTHORPE-J.A.P., 1916, latest model, 2½ h.p., Enfield 2-speed gear, just arrived from works; £37/16.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7001]

CALTHORPE-J.A.P., 2½ h.p., 1915, Enfield 2-speed, condition as new, Miller's lamp, £11 horn, all accessories; bargain, £28.—A. M. Webster, 51 Squadron, R.F.C., Norwich. [7027]

CALTHORPE Motor Cycles, 1916 models.—Just arrived; 2-stroke 2-speed 31 gns. J.A.P., 2½ h.p. 2-speed 36 gns.; easy terms arranged.—Storey's, 118, St. Portland St., W. [0777]

CALTHORPE-J.A.P.'s, with Enfield gears, actually in stock; £37/16; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7030]

CALTHORPE-J.A.P.'s and 2-strokes; immediate delivery from stock of all models; cash or exchange.—Colmore the Agents, Calthorpe the motor cycle, 261, Deansgate, Manchester. [0815]

CALTHORPE latest 1916 2-speed models in stock; cash or exchange; no waiting. Also a few brand new 1915 models, slightly soiled at reduced prices.—Eagles and Co., High St., Acton. [X2289]

CALTHORPE-J.A.P., 1916 latest models in stock, 2½ h.p., 2-speed, free engine, 36 gns.; 4h.p. twin J.A.P. lightweight combination, complete, 67 gns.; lady's 2-stroke 2-speed model, 34 gns.; cash or extended terms.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0551]

CALTHORPES, new 1916 models, 2½ h.p. J.A.P. engine, 2 speed Enfield gear, £37/16; 2-stroke models, 2-speed, £28/17/6; 2½ h.p. single speed models, £32; also the sidecar combination, fitted with twin-cyl. 4-5 h.p. J.A.P. engine, 2-speed gear, handsome light coachbuilt sidecar, the combination 67 gns.; exchanges or easy terms arranged.—Wanchopes, 9, Shoe Lane, London. [7149]

## Campion.

CAMPION-VILLIERS, 2½ h.p., fine little lightweight engine extra good, guaranteed machine; £21, or reasonable offer.—Layton's Garage, Bicester, Oxon. [X2393]

1914 4h.p. Campion-Jap, Jardine countershaft 2-speed gear, chain drive, coachbuilt sidecar, new 26x2¼ Kempshall tyre, good order; £28.—The Premier Motor Co., Aston Rd., Birmingham. [7235]

## Centaur.

CENTAUR, 3½ h.p., semi T.T. just thoroughly overhauled, fast, flexible, and pulls well, sound tyres and belt, enamel perfect; £15.—Moore, 222, Bankes Rd., Small Heath, Birmingham. [X2251]

## Chater-Humber.

3 h.p. Chater-Humber, drop frame, just overhauled, re-enamelled, new tank, B. and B. complete, £8; Excelsior engine, £2.—27, Wilbury Av., Hove. [7079]

## WE CAN DELIVER EX ACTUAL STOCK

the undermentioned

### 1916 MODELS.

<b>Morgan</b>	No. 2 G.P. model, all accessories, red finish	£147 6 6
<b>Harley-Davidson</b>	7 h.p., 16 F, 3-speed	£80 15
<b>Harley-Davidson</b>	7 h.p., 16 J, electric equip..	£89 5
<b>Harley-Davidson</b>	Sidcar de Luxe for either.....	£21 0
<b>Indian "B"</b>	5 h.p., semi T.T. bars	£70 0
<b>Indian "B"</b>	5 h.p., 3-speed, and Sidcar	£86 16
<b>Indian "F"</b>	7 h.p. Power-plus, 3-speed..	£83 0
<b>Indian "F"</b>	and Sidcar ..	£104 0
<b>Indian</b>	ditto, electric equipment	£111 0
<b>Indian</b>	Powerplus, 7 h.p. 3-sp., semi T.T.	£75 0
<b>Enfield</b>	6 h.p., 2-speed Combination ..	£89 5
<b>Calthorpe</b>	4 h.p., 2-speed Combination ..	£60 7
<b>Allon</b>	2½ h.p., 2-speed 2-stroke ..	£42 0
<b>Allon</b>	2½ h.p., single-sp., 2-stroke ..	£36 0
<b>Allon</b>	2½ h.p., 2-speed and clutch ..	£45 0
<b>Royal Ruby</b>	2½ h.p., 2-stroke s. speed ..	£29 10
<b>Royal Ruby</b>	2½ h.p., 2-stroke 2-speed ..	£36 10
<b>Royal Ruby</b>	2½ h.p., J.A.P., ladies' model ..	£46 10
<b>Royal Ruby</b>	2½ h.p., J.A.P., 2-speed ..	£42 0
<b>Sun Villiers</b>	2½ h.p., 2-stroke s. speed ..	£29 10
<b>Sun Villiers</b>	2½ h.p., 2-stroke 2-speed ..	£36 0
<b>Sun V.T.S.</b>	2½ h.p., 2-stroke s. speed ..	£30 16
<b>Sun Villiers</b>	2½ h.p., 2-stroke 2-speed de Luxe ..	£37 0
<b>New Ryder</b>	2½ h.p., J.A.P., 2-speed ..	£33 12
<b>Levis</b>	2 h.p., popular 2-stroke ..	£32 0
<b>J.H. Levis</b>	2-spd., 2-stroke ..	£39 8
<b>Coventry</b>	2-stroke, 2-speed ..	£47 10
<b>Eagle</b>	2-stroke, single-speed..	£36 15
<b>Calthorpe</b>	2½ h.p., 2-speed ..	£35 14
<b>Calthorpe</b>	2½ h.p., 2-stroke 2-speed ..	£32 11

Exchanges arranged on any of the above. Carriage paid to country customers. All machines carry the makers' catalogue guarantee, and are ready to ride away. Call and inspect. You are welcome.

Machines starred (\*) are sidcar combinations.

# MAUDES

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### MOTOR CYCLES FOR SALE.

#### Chater-Lea.

- 1915 Chater-Lea, 2-stroke, countershaft, perfect order; £26.—F. Roberts, Stamford. [X2241]  
 1915½ Chater-Lea, 2-stroke, 2½ h.p., T.T., 2-speed, done 1,100, perfect; £32/10.—Collis, Strood, Kent. [X2190]  
 1915 Chater-Lea 8 h.p. Combination, Sturmer-Archer 3-speed, gear; £58; looks and runs like new.—29, Masterman Rd., High St., East Ham. [7215]  
 8 h.p. Chater-Lea, with tandem sidcar, 3-speed gear box, and new tyres.. any trial given; guaranteed perfect; £55, or nearest offer.—45, Bow Common Lane, Bow, E. [7121]  
 8 h.p. 1913 Chater-Lea, new coachbuilt sidcar, handle starting, twin-cyl., 3 speeds, multiple clutch, Bosch, speedometer, 7in. Rushmore head lamp, large generator, posthorn, watch; £47/10.—Easton, 15, Long-Acre, W.C. [7177]  
 CHATER-LEA No. 7 Combination, 6 h.p. J.A.P., countershaft 3-speed gear box, clutch, handle starting, tyres and condition good, new Spencer-Moulton to back, spare tyre, tube, valves, etc.; nearest offer to £40.—Warren, 1, Stormont Rd., Clapham Junction. [X2211]

#### Clyno.

- CLYNO, 6 h.p., 1913, kick start, Clyno coach sidcar; £38.—28, St. Leonard's St., Bow. [7201]  
 CLYNO, 1914, 6 h.p., 3-speeds, clutch, and starter, detachable wheels, £35.—P. J. Evans, John Bright St., Birmingham. [X2347]  
 CLYNO, 1914½, 6 h.p., coach combination, 3 speeds, screen, hood; £55; or exchange solo mount.—Sinclair, East Molesey. [X2389]

#### Connaught.

- CONNAUGHT, 2½ h.p., 3-speed gear and clutch, splendid lightweight machine, and guaranteed; £26.—Colmore Depot, 31, Colmore Row, Birmingham. [X2175]  
 CONNAUGHTS in stock for immediate delivery, miniature, standard, and 2-speed models, prices from £28/17/6.—P. J. Evans, John Bright St., Birmingham. [X2340]

#### Corah.

- 6 h.p. Corah-Jap, Jardine 4-speed, usual accessories, Turner coachbuilt sidcar, hood, screen; £50.—180, Turner's Hill, Cheshunt, Herts. [6786]

#### Coventry Eagle.

- COVENTRY Eagle, 2½ h.p., late 1915, 2-stroke, all accessories, very little used, new condition; £28, or near offer.—3, Carson Rd., W. Dulwich. [7108]

#### Douglas.

- 1915 3-speed Douglas, 2,500 miles; £40.—MacDowell, 5th Black Watch, Ripon. [X2007]  
 DOUGLAS, 1911, 2-speed, clutch; bargain, £16/10.—F. 17, Rosemont Rd., Acton. [7240]  
 DOUGLAS, 1913, 2½ h.p. twin, Bosch, 2 speeds; bargain, £29/10.—1, Ebner St., Wandsworth. [X2255]  
 LATEST Model U Douglas, immediate delivery; £50/8.—King and Harper, 6, Bridge St., Cambridge. [6890]  
 1909 Douglas, in good order; bargain, new tyres. £12.—Jones, Garage, Broadway, Muswell Hill. [6240]  
 DOUGLAS, 1915, 2½ h.p., 3-speed model U, very good condition; £42/10.—Stour Cycle Depot, Stourbridge. [X2311]  
 DOUGLAS, 2½ h.p., splendid gear, and in good order; £15.—Colmore Depot, 31, Colmore Row, Birmingham. [X2157]  
 DOUGLAS, 1914, 2 speeds, accessories, first-class condition; £36/10.—436, Whitehorse Rd., Thornton Heath. [7025]  
 DOUGLAS, 1915, 2½ h.p. War Office model, 2-speed, semi T.T. bars, dynamo lighting set, complete; £45.—Below. [X2311]  
 DOUGLAS, 2½ h.p., 2-speed, T.T. bars, splendid order; £36.—Eice and Co., 15-16, Bishopsgate Av., Cannon St., E.C. [7041]  
 1911 Douglas, in good order, footboards, nearly new tyres; bargain, £15.—Groves, 21, Silcott St., Brightingsea. [X1749]  
 DOUGLAS, late 1914, model U, lamps, horn, speedometer, spare new belt and valves; £38.—W. 58, St. George's Rd., Peckham. [7066]  
 DOUGLAS, 1915 (October), 2½ h.p., fully accessoried; cost nearly £60, sell £40; perfect; any trial.—Taylor, Warren Wood, Crowthorne. [7060]  
 DOUGLAS, new, latest pattern, 2½ h.p. models for immediate delivery, including War Office Black Douglas.—Moffat, Yeovil. Tel.: 50. [5855]  
 DOUGLAS, late 1914, 2-speed, perfect condition, hardly used, all accessories; bought combination; £36.—Wells, Butcher, Wanstead, N.E. [7206]  
 DOUGLAS Specialists.—Gibb, Gough, London Rd., Gloucester. Gibb, the International Douglas rider, winner of numerous cups and gold medals. [1189]  
 DOUGLAS, 2½ h.p., 1914½, 2 speeds, clutch model, all lamps, accessories, very little used, excellent condition; £39.—Warne and Co., Dorking. [7178]  
 DOUGLAS, 1914½, 2½ h.p., F.E. lamps, horn, Brooks valve, spares, accessories, excellent condition; £40, or near offer.—Box L1, 612, c/o The Motor Cycle. [6997]  
 DOUGLAS, 1912, entirely new engine March, 1916, by makers; offer leaving country, sacrifice £21.—Jones, College Farm, Amphill Rd., Bedford. [X2304]

## SECOND-HAND BARGAINS.

ALL GUARANTEED IN GOOD  
RUNNING ORDER.

### SIDECAR OUTFITS.

- REX, 1914, 6 h.p. de Luxe, 3-speed model, coach-built Sidcar, chain drive, 650×65 tyres, just been overhauled ..... £50  
 MATCHLESS, 1914, 8 h.p., M.A.G. engine, 3-sp. countershaft gear, all chain drive, Lucas dynamo lighting outfit, 3 lamps, 650×65 tyres, Watford speedometer, and excellent outfit ..... £78  
 HARLEY-DAVIDSON, 7-9 h.p., 1915, 3-speed, with Coronet Sidcar (coach built), head lamp, electric horn, and full complement of tools ..... £64  
 J.H., 1915, 6 h.p., M.A.G. engine, Sturmer-Archer countershaft gear, 3 speeds, chain drive, complete with best quality Canelet Sidcar, with hood and screen, brand new, but last year's model; list price, £100 ..... £82  
 REX, 1914, 6 h.p., 2-speed, Model de Luxe, handle starting, twin engine, 650×65 tyres, coach-built Sidcar, just been overhauled, excellent condition and a bargain at ..... £46  
 TRIUMPH, 3½ h.p., 1911, 2-speed countershaft gear, chain-cum-belt, complete with wicker Sidcar; cheap at ..... £30  
 NEW HUDSON, 1914, 6 h.p., 3-speed, kick start, complete with New Hudson coach-built Sidcar with screen, all accessories ..... £53  
 TRIUMPH, 1915, 4 h.p., 3-speed, with coach-built Sidcar, all accessories, including speedometer ..... £52  
 ZENITH, 1915, 6 h.p., countershaft, complete with Millford Sidcar ..... £68

### LIGHT CARS, Etc.

- GARDEN, 1914, 4-5 h.p., Jap engine, 2 speeds, handle start, single-seater, an ideal car for one £65  
 G.W.K., 10 h.p., 4 speeds, 80 mm. tyres, 1914 model, just being repainted ..... £120  
 MORGAN, 1915, 8 h.p. G.P. No. 1, water-cooled, disc wheels, hood and screen, large tyres, all lamps, Binks carburettor, very fast ..... £125  
 FORD, 1913, 20 h.p., 4 seater, detachable wheels, make a splendid light van ..... £34  
 SIZAIRE-NAUDIN, 1914, 12-14 h.p. Coupé, C.A.V. large size dynamo outfit, 5 lamps, 5 detachable wheels, just repainted and overhauled, like new ..... £310  
 CADILLAC, 1914, 20-30 h.p., 6-speed model, 7-seater, does 22 miles per gallon, just overhauled, dynamo light and starting, just being repainted, make a very fine hire car ..... £320

### SOLO MOTOR CYCLES.

- P. & M., 1913, 3½ h.p., 2-speed model, kick start, fine Sidcar model ..... £35  
 TRIUMPH, 1914, 4 h.p., 3-speed hub gear, speedometer, and all lamps, all tyres like new £46  
 ENFIELD, 1915, 3 h.p., 2 speeds, Palmer tyres, T.T. bars, mechanical oiling ..... £40  
 INDIAN, 1914, 7 h.p., clutch, just overhauled ..... £40  
 IVY, 1914, 2½ h.p., single speed, 2-stroke, excellent order and condition ..... £15  
 REX, 1913, 3½ h.p., clutch model, good tyres, magneto, spring forks ..... £20  
 PREMIER, 1913, 3½ h.p., 2-speed countershaft model, very good Sidcar machine ..... £25  
 DOUGLAS, 1911, 2½ h.p., 2 speeds, spring forks, Bosch magneto ..... £22  
 VELOCETTE, 1915, 2½ h.p., 2-speed lightweight, all-chain drive, fine solo mount ..... £21  
 SUN-VILLIERS, 1914, 2-stroke, single speed, spring forks, footrests, stand, and carrier .. £19  
 PORTLAND-J.A.P., 1913, 8 h.p., 3 speeds, B.S.A. gear box, chain drive, T.T. bars .... £34

Exchanges arranged on any of the above.  
All in good sound order.

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## NEW MODELS.

**MORGANS**—Sporting and De Luxe Models in stock.  
**SUNBEAM**, 8 h.p., countershaft 3-speed ... £91 10  
**WILLIAMSON** Cy cl-ca, w.c. Douglas engine £126 0  
**RITZ** 4-cylinder Light Car ... £145 0  
**OVERLAND** 4-seater, 12 h.p. ... £225 0  
**CONNAUGHT**, 2½ h.p., 2-speed ... £41 16  
**ROYAL RUBY**, 2½ h.p., 2-speed, 2-stroke ... £36 10  
**ROYAL RUBY J.A.P.**, 2½ h.p., 2-speed ... £39 10  
**ROYAL RUBY**, 6 h.p., 3-speed ... £87 0  
**LEVIS**, 2½ h.p., 2-stroke, dyn. lighting, &c ... £71 10  
**NEW IMPERIAL**, 2½ h.p., variable magneto ... £32 0  
**REX**, 6 h.p., kick start, and Rex Sidecar ... £71 0  
**DOUGLAS MODELS**—orders booked now.

## (U.S.A.) EXCELSIOR,

7 h.p., 3-speed model 84 x 89, countershaft gear, chain drive, mechanical and hand lubrication, high-tension magneto, multiple-disc clutch with dual control, kick starter, 2 gal. petrol capacity; £62. Or with electrical equipment; £71 10s.

Exchanges quoted. Easy Payments arranged.  
 Sole Yorkshire Distributors. Trade Supplied.

## PERFECTION SIDECARS

to suit B.S.A., SUNBEAM, and other standard machines, Dunlop tyre, body finished black and gold ... £12 0

## SOLO MACHINES.

1915 2½ h.p. 2-speed **NEW RYDER**, 2-stroke ... £19 19  
 1913 3 h.p. **ROVER**, 3-speed ... £34 10  
 1913 3 h.p. **F.E. RUDGE** ... £26 10  
 1913 3 h.p. **ROVER**, Grade gear ... £27 10  
 1912 3 h.p. 2-speed **TORPEDO** ... £19 19  
 1912 3 h.p. 2-speed **ZENITH-GRADUA** ... £26 10  
 1912 3 h.p. 2-speed **TRIUMPH**, very fast ... £26 10  
 1912 3 h.p. 2-speed **F.E. HUMBER** ... £26 10  
 1912 3 h.p. 2-speed **TRIUMPH**, very fast ... £26 10  
**EXCELSIOR**, 3½ h.p., 3-speed, Druid forks ... £17 10  
**KERRY**, 3 h.p., magneto, Saxon forks ... £12 10  
 5½ h.p. magneto **REX**, spring forks ... £15 10  
**N.S.U.**, twin, 2-speed, spring forks ... £18 10  
**TRIUMPH**, magneto, new tyres ... £27 10  
**P. & M.**, 3½ h.p., 2-speed, chain drive ... £25 10  
**S.P.K.**, 3½ h.p., 3-speed countershaft ... £22 10  
**REX**, 1910, 5-h.p., 2-speed, F.E. ... £18 10  
**REX**, 1909, 5-h.p., 2-speed, F.E. ... £11 15  
**REX**, 3½ h.p., magneto, spring forks ... £14 10  
**DOUGLAS**, 2½ h.p., magneto, spring forks ... £18 10  
**DOUGLAS**, 2½ h.p., 2-speed, wants attention ... £21 10  
**TRIUMPH**, 3½ h.p., clutch model ... £21 10

## SIDECAR COMBINATIONS.

1914 6 h.p. **ARIEL**, chain drive, and Sidecar ... £45 0  
 1914 3½ h.p. 3-speed **ARNO** and Sidecar ... £36 10  
 1914 6 h.p. **REX** Sidette, almost as new ... £43 10  
 1913 6 h.p. **REX** Sidette, very smart ... £43 10  
 1913 7-h.p. **QUADRANT** and Sidecar ... £49 10  
 1912 6 h.p. 2-speed **REX** and Sidecar ... £32 10  
 1912 3½ h.p. 2-speed **PREMIER** and Sidecar ... £33 10  
 1910 3½ h.p. 2-speed **REX** and Sidecar ... £24 10  
 3½ h.p. 2-speed **P. & M.** and Sidecar ... £19 19  
**REX**, 5½ h.p., 2-speed, and Sidecar ... £22 10

## MISCELLANEOUS.

1914-15 Grand Prix **MORGAN** and accessories ... £98 10  
**MORGAN**, 1913, lamps, horn, screen, etc. ... £59 10  
**G.W.K.** 2-seater, all accessories ... £92 10  
**ROVER** 5 h.p. 4-seater, all on, bargain ... £39 10  
**RENO** 15 h.p. 4-cylinder Touring Car ... £65 0  
**PREMIER** 7-h.p. 2-seater Light Car ... £67 10  
 New Mechanical Horns ... 1/6  
 New Acetylene Tail Lamp, post free ... 1/4  
 At Mudscree, cost 21/-, take ... 10/6  
 P. & H. Separate Generator Lamp ... 17/6  
 Miller's late type Lamp Set ... £1 4  
**REX**, 6 h.p., twin engine, magneto and carb. ... £9 10  
 8 h.p. Water-cooled Engine, fine condition ... £4 10  
 5½ h.p. W.C. Engine, 2-speed, clutch ... £5 10  
 3-wheel Cycle Car Chassis, 26x2½ wheels ... £3 15  
 Brooks Brgo large size Pan Seat ... 18/6  
 Cash Offers Solicited.

**WANTED.**—Second-hand 1913-1914 **DOUGLAS**, for Cash.

## MOTOR CYCLES FOR SALE.

### Douglas.

**DOUGLAS**, 1914, 2½ h.p., 2-speed, clutch, recently thoroughly overhauled by makers, new tyres, lamp, tools; £37.—Aveston, Henrietta St., Bath. [7091]

1915 **DOUGLAS**, 2½ h.p., 2-speed, footboards, 2 lamps, horn, engine overhauled, condition perfect; £46/10.—Robinson's Garage, Green St., Cambridge. [7099]

**DOUGLAS**, 3-speed, 2½ h.p. Colonial model, bought May, 1915, owner left for firing line September; no offers, £40 nett.—Telephone: Central 3177 Birmingham. [7075]

**DOUGLAS**, 1913, 3½ h.p., model W, clutch, kick-start, excellent tyres, engine overhauled, lamp, and horn; £35.—Robinson's Garage, Green St., Cambridge. [7120]

**COLMORE** Depot, Birmingham, Manchester, Leicester, and Liverpool, have in stock complete range of all models Douglas for immediate delivery, also full range of spares. [0800]

LATE 1913 **DOUGLAS**, 2-speed, kick-starter, new tyres, belt, perfect order throughout, Lucas fittings; £35, or cash adjustment for 1916 K.B.S.A.—Avon, Broseley, Salop. [7085]

**DOUGLAS**, 4h.p., 1915 model A, 3 speeds, completely equipped, only run 2,000 miles, equal new; price £55; no offers; property of an officer.—The Morris Garages, Oxford. [0792]

1915 **DOUGLAS**, 4h.p., 2 speeds, free engine, kick start, with coachbuilt sidecar, complete, as new; cost £92, lowest £58; called up.—Lancaster, 9, Church St., Poulton-le-Fylde. [6944]

2½ h.p. **DOUGLAS**, re-hushed, thoroughly overhauled, perfect condition, tyres equal to new, climb anything with pillion passenger; £24.—Clark, Garage, Long Melford, Suffolk. [7089]

1915 3½ h.p. **DOUGLAS**, T.T. model, 2-speed, 26x2½ in. Dunlop R.S. tyre, head lamp, tail lamp, horn, tools, etc., in very good order; £42.—The Premier Motor Co., Aston Rd., Birmingham. [7236]

1912 **DOUGLAS** Motor Cycle, 2½ h.p., 2-speed gear, clutch, and footboards, good condition, complete with lamp, horn, speedometer, watch, and tool kit; price £25.—W. N. L. Drawbridge, Ellesmere, Salop. [X2238]

**DOUGLAS** Motor Bicycles.—2½ h.p. models. We have one or two brand new latest pattern machines in stock for immediate delivery. The number is very limited, and further supplies are almost impossible to obtain. We therefore suggest you order from us at once and obtain instant delivery.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Telephone: 388. Telegrams: Bicycles. [7095]

### Edmund.

**EDMUND**, adjustable spring frame motor cycles; price £46/4; early delivery. Some are financed by others, in our case, it is unnecessary; we garage motor cycles for 1/- per week.—Messrs. Green, Taxis, Villier St. Garage, Charing Cross, London. [6639]

### Elswick.

**ELSWICK**, 2½ h.p., 2-stroke, unriden; £27.—Bond, 245-247, Euston Rd., London, N.W. [X2330]

**ELSWICK** 1915 2½ h.p. 2-stroke, single speed, engine guaranteed perfect; £17.—Robinson's Garage, Green St., Cambridge. [7101]

### Enfield.

**ENFIELD** New 1916 6h.p. Combination actually in stock; no waiting.—Moss, Wem. [X2376]

**COLMORE** Depot, 31, Colmore Row, Birmingham, for immediate delivery of Enfields. [0801]

1916 **Enfield**, 3h.p., lamps, horn, etc.; £48.—F. Land, Colonial Works, Queen's Rd., Sheffield. [X2184]

**ENFIELD** Combination, 6h.p., 2-speed, coachbuilt, all accessories; £45.—Leighton's, opposite Wood Green Station. [6937]

1916 **Enfield** Combinations actually in stock, latest models.—Celtic Motor Works, East Hill, Wandsworth. [6398]

**ENFIELD**, 1915, 3h.p., 2-speed, kick start, speedometer, etc.; £43, no offers.—187, Hammersmith Rd., London. [7133]

**ENFIELD** 6h.p. Combination, new, latest 1916 model, actually in stock; price 85 gns.—The Morris Garages, Oxford. [0811]

**ENFIELD** 1916 6h.p. Combination, actually in stock; £89/5; exchange entertained.—Eagles and Co., High St., Acton, W. [X2292]

**ENFIELD** Combination, 1914, perfect condition throughout, ready for tour anywhere; 53 gns.—51, Burnt Ash Rd., Lee, S.E. [7073]

1916 8h.p. **Enfield** Combinations; 2 actually in stock; £91/5. Easy payments if desired.—Jones, Garage, Broadway, Muswell Hill. [6594]

**ROYAL** **Enfield**, 2½ h.p., all-chain drive, splendid order; £22/10, genuine bargain.—Colmore Depot, 31, Colmore Row, Birmingham. [X2177]

**ROYAL** **Enfield** 6h.p. Combination, coachbuilt sidecar, good order; £50, with accessories.—Colmore Depot, 31, Colmore Row, Birmingham. [X2154]

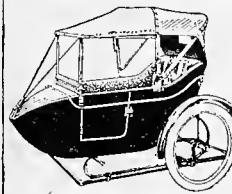
1915 **Enfield**, T.T., 3h.p., twin, 2-speed kick starter, Binks, electric light, horn, etc.; £37/10.—4, North Side, Wandsworth Common, S.W. [X2013]

1916 6h.p. **Enfield** Combination, like new, Stewart's horn, speedometer, lamps, spares; £82.—Celtic Motor Works, East Hill, Wandsworth. [7167]

## FARLOW SIDECARS.

Built throughout in our own factory.

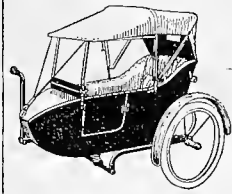
Farlow Sidecars have that pleasing style, exquisite finish, and lasting qualities which are the buyers' ideal.



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 Underling Chassis,  
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Splendidly made and  
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Hood ..... £2 4  
 Screen ..... £1 0



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 MODEL No. 2.  
 A BEAUTIFUL LIGHT  
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PRICE ..... £10  
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1916 4 h.p. **A.J.S.** Combination, interchangeable wheels, very fine ..... 90 gns.  
 1916 6 h.p. **ENFIELD** Combination ..... 85 gns.  
 1916 8 h.p. **ENFIELD** Combination ..... 87 gns.  
 1916 6 h.p. **J.H.** Combination ..... 90 gns.  
 1916 6 h.p. **NEW HUDSON** Combination ..... 88 gns.  
 1916 2½ h.p. **NEW HUDSON**, 2-sp., 2-stroke ..... £38 0  
 1916 2½ h.p. **OMEGA J.A.P.**, 2-speed ..... 38 gns.  
 1916 2½ h.p. **OMEGA**, 2-stroke, 2-speed ..... 38 gns.  
 1916 5-6 h.p. **British EXCELSIOR**, Sturmeys countershaft 3-speed gear ..... 68 gns.  
 1916 4½ h.p. **British EXCELSIOR**, Sturmeys countershaft 3-speed gear ..... 64 gns.  
 1916 **FORD** Touring Car, 20 h.p. .... £135 0  
 1916 **FORD** Chassis, 20 h.p. .... £115 0  
 1916 **FORD** Van, 20 h.p. .... £130 0  
 1916 20 h.p. **Ford Ambulance** .... £135 0  
 1915 12 h.p. **TRUMBULL** Cycle Car, 4-cyl., water-cooled, detachable wheels, all on £120 0

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4 h.p. **BRADBURY**, 2-speed, kick starter ... £20 0  
 1914 6 h.p. **NEW HUDSON** Combination, countershaft drive, 3 speeds, kick starter, fine turnout ... £44 0  
 1911 **P. & M.**, and smart Coronet Sidecar ... £25 0  
 3½ h.p. **HUMBER**, 2 speeds, fine goer ... £20 0  
 4 h.p. **BRADBURY**, two speeds, and Sidecar ... £20 0  
 1913 **SCOTT**, lamp, speedometer, etc. .... £30 0  
 1915 **WOLF**, lightweight, 3-speed ... £25 0  
 2-speed **RADCO**, 2-stroke, fine condition ... £25 0  
 2-stroke **OMEGA**, Druid forks ... £19 0  
 1914 **DOUGLAS**, 2-speed, fine machine ... £36 0  
 3 h.p. **N.S.U.**, spring frame, 2-speed ... £17 0  
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Fully Guaranteed.

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Stewart Speedometer with trip ..... 30/-  
 Nice Coach-built Sidecar ..... £4 10  
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 New 650x65 Dunlop Rubber-studded Covers ..... 22/6  
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 F.R.S. Lamp Set, 500 beam, shop-soiled ..... 35/-  
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 New Clincher Clearance Covers, de Luxe, "heavy," rubber-studded, 26x2½, 26x2½, 26x2½, and 26x2½x2½ ..... each £1 0

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## MOTOR CYCLES FOR SALE.

## Enfield.

ENFIELD 1916 6h.p. Combination, latest model, just arrived from works: £89/5.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6999]

ENFIELD 1915 6h.p. Coachbuilt Combination, complete with lamps, horn, etc., excellent condition; £65.—P. J. Evans, John Bright St., Birmingham. [X2346]

ENFIELD actually in stock for immediate delivery, 6h.p. combinations, 3h.p. and 2½h.p. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [X2343]

ENFIELD Late 1913 6h.p. Combination, new tyres, speedometer, lamps, etc., in first-class condition; £46, or near offer; any trial.—S. Carson Rd., W. Dulwich. [7112]

ENFIELD, 1916; immediate delivery of latest 6h.p. combination, now in stock: £89/5; make sure of this new—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7000]

ENFIELD 1915 6h.p. Combination, just thoroughly overhauled by makers, speedometer, lamps, etc.; £65, a bargain.—Shinner, Draper, High St., Leatherhead, Surrey. [7049]

ENFIELD Coach Combination, 1914, beautiful condition, little used, fully equipped, luggage grid, brand new tyres; any trial: £50; see Wanted column.—Box 550, c/o The Motor Cycle. [X2326]

ENFIELD Combination, 1916, indistinguishable from new, £80; a 1915, in nice condition, £65; a 1914, in nice condition, £55; a 1913, in good order, £40.—Warren's, 6, Warren St., London. [7169]

ENFIELD 1916 6h.p. Twin Combination, 3 lamps, Stewart speedometer, all accessories, practically new; £80 cash.—Clarke, King's Arms, 251, Tooley St. (near Tower Bridge), side door. [7083]

ROYAL Enfields (three), lightweight twins, mag., running order, £121/5, £14/10, £15/10 each; exchanges, easy terms arranged.—Wandsworth Motor Exchange, Eberst St., Wandsworth Town Station. [X2256]

ENFIELD, 6h.p. combination, 1915, done under 5,000; speedometer, Lucas horn, sidcar screen, head lamp, spare tube, lots of spares; £72/10.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7008]

ENFIELD, 3h.p., 1916, latest model, just arrived from works; immediate delivery; make sure of this now: £52/10. We are Enfield specialists.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7003]

1916 Enfield 6h.p. Combination, new March, only ridden 300 miles, lamps, Gloriphone, wind screen, luggage grid, etc.; sacrifice, £75; owner joined Forces.—Waterhouse, 7, Hartington St., Barrow-in-Furness. [X2355]

ENFIELD 6h.p., £89/5, combination; De Luxa combination, with hood and screen, £110; 3h.p., £52/10; all actually in stock: liberal deferred terms.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7032]

ENFIELD Combination, 1916, with hood, screen, Stewart's speedometer, Lucas acetylene lamps, Colieze mudguards, mileage under 800, splendid condition; selling owing to buying motor; cost £104, will take £90.—Mrs. Harrison, Drayton, Belbroughton, near Stourbridge. [X2368]

## Excelsior.

AMERICAN Excelsior Combination, 1915, electrical equipment, and horn guaranteed perfect; trial given; tyres new; cost over £100, owner called up, £65, or offer.—Foresters' Arms, 94, Brady St., Whitechapel. [7120]

## F.N.

1911 F.N., 4-cyl., has been made low, and is a fast and sporting machine; £14, or offer.—46, Alfred St., Islington. [7051]

7h.p. F.N. M.O. and sidcar, in perfect order; £65.—Bodman, c/o F.N. Works, Kimberley Rd., Willesden Lane. [7105]

F.N., 2½h.p., late 1914, splendid condition; £26, or nearest offer; 2-speed.—Eagles, Homer Cottage, Dorchester Rd., Weybridge. [7182]

1913 F.N., 4-cyl., 2-speed, F.E., lamp, horn, accessories, splendid order; £20, no offers.—106, Stratford Rd., Wolverhampton. [X2300]

F.N., like new, 2 speeds, clutch, just overhauled by makers, £13 sidcar, owner going France; £30, or offer.—Beulgue, 36, Stapleton Hall Rd., Stroud Green, North. [7092]

A BARGAIN.—F.N. 2½h.p., 2-speed, shaft drive, h.b. clutch, drip feed, dropped frame, spring forks, mag., good tyres, lamps, etc., very fast; £12.—Griffiths, Woodfield Villa, Queasterry, near Chester. [X2205]

## Harley-Davidson.

BRAND New Harley-Davidsons.—See below.

MODEL F. 7-9h.p., 3-speed; £68.—The Premier Motor Co.

MODEL J. 7-9h.p., 3-speed, with dynamo electric lighting outfit; £75.—The Premier Motor Co.

THE Above are guaranteed brand new; standard specification and standard equipment.—The Premier Motor Co., Birmingham.

SPECIAL Gloria Sidcars, to match; 19 and 25 gns. You save £17 by purchasing your new combination direct from the recognised H.D. experts. Delivery charges paid to any address.—The Premier Motor Co., Aston Rd., Birmingham. [7238]

## MOTOR CYCLES FOR SALE.

## Harley-Davidson.

HARLEY-DAVIDSON, 1915, 7-9h.p., 3 speeds, clutch, accessories; bargain, £52/10.—Below.

HARLEY-DAVIDSON, 1915, 7-9h.p., 3 speeds, clutch, electric lighting, splendid order; £55.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0480]

HARLEY-DAVIDSON, 1915 model 11F, 3 speeds, unused; £73.—Bond, 245-247, Euston Rd., N.W. [X2329]

HARLEY-DAVIDSON, 1916 models; immediate delivery from stock.—Colmore Depot, 261, Deansgate, Manchester. [6027]

1915 Harley-Davidson, new, complete, electric lighting, and coachbuilt sidcar; £86/15.—Bull, St. Giles' Sq., Northampton. [X2282]

HARLEY-DAVIDSON, 7-9h.p., 1914, 2-speed, Cowey speedometer, and coachbuilt sidcar, £47.—Moseley, St. Ann's Rd., Harrow. [X2160]

COLMORE Depot, Birmingham, Manchester, Liverpool, Leicester, for immediate delivery of all models of Harley-Davidsons and spare parts. [0802]

HARLEY-DAVIDSON, late 1915, thoroughly overhauled by makers; £66/10, with sidcar £80.—Colmore Depot, 31, Colmore Row, Birmingham. [X2158]

BRAND New Shop-soiled 1915 Harley-Davidson, Model 11F, 3 speeds and clutch; £62 cash; approval on deposit.—Horswill, 103, Brook St., Chester. [7071]

HARLEY-DAVIDSON, 7-9h.p., 1915 combination, very little used; cost nearly £100 last October, sacrifice 65 gns.; perfect order; been carefully stored; bargain.—3, King's Rd., Windsor. [7046]

HARLEY-DAVIDSON 1915 Combination, Mills-Fullord £16/16 sidcar, painted grey to match machine, new Dunlop heavy tyre, horn, and all accessories; £73.—Vincent Motors, Rugeley, Staffs. [X1423]

HARLEY-DAVIDSON, November, 1915, 11F, Montgomery sidcar, screen; carrier to match, used occasionally, all accessories, guaranteed as new; £70.—Andrade, 1, Colosseum Terrace, Regent's Park. [7068]

HARLEY-DAVIDSON, 7-9h.p., 1916 magneto model, also special Gloria sidcar, full equipment of accessories; £90; demonstration turnout, fully guaranteed; any trial.—Colmore Depot, 31, Colmore Row, Birmingham. [X2156]

1915 Harley-Davidson, 11F model, 7-9h.p., 3-speed, 2,700 miles only, excellent tyres, Lucas head lamp, rear lamp, horn, Watford speedometer, with Fullford Empress sidcar, with apron, complete; £68.—Robinson's Garage, Green St., Cambridge. [7098]

1916 Latest Harley-Davidson, just delivered from works, complete combination, fitted with £21 sidcar, with lighting set and hooter; immediate delivery from stock; £105/19 cash; extended payments or exchange.—Wanchop's, 9, Shoe Lane, London. [7150]

HARLEY-DAVIDSON Sidcar Combination, late 1915, model 11F, 8h.p., Goodyear 3in. tyres, speedometer, lamps, horn, tools, etc., splendid, smart, economical outfit; reluctantly offered through war; any trial; bargain, £73.—Day, 154, The Rye, East Dulwich. [7067]

HARLEY-DAVIDSON, electric model, £89; standard £80/15; delivered from stock; also sidcars to suit; deferred payments to suit individual requirements; also 1915 electric model, with Empress sidcar, £68/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7034]

HARLEY-DAVIDSON, second-hand, model 11C, 4½ h.p. single-cyl., 2-speed, chain drive, 28x3 Good-year rubber-studded tyres, special Canoelet coachbuilt sidcar, enamelled to match, complete with accessories, and not done over 500 miles; £55.—The Premier Motor Co., Aston Rd., Birmingham. [7237]

HARLEY-DAVIDSON, the silent grey, 1916 models, immediate delivery from stock, with Gloria, Millford, or Canoelet sidcars; two only 1915 electrically equipped models at pre-Budget price, £76/15. Write or call.—Colmore Depot, 261, Deansgate, Manchester, and 31, Renshaw St., Liverpool. [0817]

HARLEY-DAVIDSON, 1916, and handsome coachbuilt sidcar with apron, 3-speed countershaft gear box, clutch kick starter, electric head and rear lamps, electric horn, Smith speedometer, Goodrich tyres 28x3, used as demonstration model only, and done under 50 miles, absolutely like new; price £104, a bargain; deferred payments arranged, 2% only extra.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [7219]

## Henderson.

HENDERSON, 1915, 10h.p., short wheelbase model, semi T.T. bars, English controls, coach sidcar, guaranteed perfect mechanical order; £60.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0492]

## Hockley.

HOCKLEY, 2½h.p., 2-stroke, single speed, £29/8; 2-speed, £36/8; immediate delivery; write for catalogue.—Hockley Motor Manufacturing Co., Ltd., 126, Barr St., Birmingham. [X2245]

## Hobart.

HOBART-VILLIERS, 2½h.p., 1915, sturdy little machine, extra good engine, overhauled; £21, or near offer.—Layton's Garage, Bicester, Oxon. [X2395]

HOBART, latest 1916 2½h.p. 2-speed 2-stroke Villiers engine, countershaft gear, controlled from handlebars, 35 gns., all-black finish, delivery from stock; exchanges or extended terms.—Elce and Co., 15-16, Bishopsgate Av., Camomile St., E.C. [0597]

NO FIRM LIKE  
**GODFREY'S**  
FOR  
NEW 1916 MODELS  
GUARANTEED  
SECOND-HAND MACHINES,  
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CYCLE  
SUIT.

There is no value offered to-day to equal this Suit. Coat and Trousers complete, made from extra strong dark fawn twill, double texture, with guaranteed rubber proofing. Double breasted Coat, 36in. long, storm collar, two side pockets, adjustable elastic inner cuffs.

Overalls with apron to protect body, well cut and fitting, with vani and spring fasteners. Chest and inside leg measures only required.

PRICE—Complete .. 38/6

Other qualities—27/6, 30/6, 32/6

WASHING AND DUSTPROOF MOTOR CYCLE  
SUIT IN DRAB HOLLAND.

COAT.—Double-breasted, tab at neck. Two pockets.

OVERALLS.—Legging shape, spat fitting fronts, spring buttons, fastening at sides.

Wonderful Value .. 9/9  
In Khaki Colour .. 10/3  
Second Quality .. 12/9  
Best Quality .. 15/9

Chest and inside leg measures only required.

## 20 PAIRS SEATLESS TROUSERS,

From double-texture proofed material. Inside leg measure from groin to 36in. A clearing line at 15/- per pair, worth 21/- to pairs FULL SEATFD ditto 16/6, worth 25/- Inside leg measure only required.

## LADIES' OILSKIN COATS.

In Black, Brown, and Yellow, 18/6 and 25/- State Chest measure.

## RIDING BREECHES,

In strong Derby and Yorkshire Grey Tweeds.

Buttoning at Sides .. 10/6

Ditto, in Khaki Bedford Cotton  
Cords, extra long, lacing at  
sides .. 10/9

Ditto, best quality .. 17/6

Waist, inside leg, and calf  
measures required.

## GLOVES — "ASBESTOL."

In tan or black.  
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PRICES—7/3, 9/3, 10/3, 12/9.

Unlined, 7/9, 9/-, 11/6

SHEEPSKIN, BLACK OR TAN, SHORT  
GAUNTLET CUFFS.

4/6 and 5/3

Any of the above articles sent on  
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## MOTOR CYCLES FOR SALE.

## Hobart.

1915 Hobart, 2½h.p., 2-speed, sporting sidecar, fitted Dunlops, all new condition, accessories; sacrifice £29/10.—Shelly, 377, Kingsland Rd., London. [X2228]

## Humber.

1914 3½h.p. Twin Humber, 3-speed gear; £20.—Apply, White's Garage, Camberley. [7204]

LIGHTWEIGHT Humber, equal to new, free engine, tyres perfect; £15.—Dart, Seedsman, Barnstaple. [X2272]

2 h.p. Humber, belt, tyres nearly new, excellent condition; £14.—Manchester House, Middlewich. [X2180]

1912 Humber, 2h.p., Grado Multi pulley, free engine; £12.—Wood, 146, Lower Richmond Rd., Putney. [7024]

1914 2½h.p. Twin Humber, good condition, belt drive; trial.—Apply, Temple, Osborne House, Champion Hill, London. [7180]

HUMBER, 3½h.p., 2 speeds, F.E., and canoe sidecar; 20 gns.; appointment.—Miss Pittold, Greyhound Lane, Streatham, S.W. [7118]

1913 2½h.p. Humber, clutch model, new tyres and belt, in good order; a bargain, £17/10.—Jones, Garage, Broadway, Muswell Hill. [6593]

HUMBER, 2½h.p., 1913 model, been re-bushed and enamelled, like new; bargain, £16/10.—Fifth, Woodbridge Rd., Moseley, Birmingham. [7214]

HUMBER, 3½h.p., 1911, reliable, N.S.U. gear, coach sidecar, good condition, all spares; 20 gns.—Simons, Stafford House, Ashturton. [7134]

3½h.p. Humber, 3-speed, S.A. gear, 1915, only soiled, sidecar, Pillion seat, all accessories; owner joined; £50.—Leighton's, opposite Wood Green Station. [6941]

3½h.p. Humber and new C.B. sidecar, 2 speeds, free engine, and all accessories, tyres new; owner's group called up; accept £25 for quick sale.—Hood, 45, Bow Common Lane, Bow. [7119]

8 h.p. 1915 Humber, sidecar combination, twin-cylinder horizontal water-cooled engine, coachbuilt sidecar, speedometer, run 764 miles; price, £77/10.—Martin, c/o The Morris Garages, Oxford. [0813]

3½h.p. Humber, late 1911, 3-speed Armstrong Mark 32 VII gear, kick starter, heavy Bates tyres, new Empire coach sidecar fitted 1915, all accessories, spares, excellent condition, also insurance policy; Loughborough district; £34.—Box 547, c/o The Motor Cycle. [X2259]

## Indian.

INDIAN, 3½h.p., good running order; must sell; £15.—76, St. Stephen's Av., Shepherd's Bush. [6948]

INDIAN, blue, sidecar, 5h.p., accessories, overhauled; £37.—55, Listeria Park, Stoke Newington. [7239]

1915 Indian, 7h.p., T.T., clutch, mileage 1,000, like new; £45.—Chaufeur, Stubbings, Maidenhead. [7174]

NEW 5h.p. Indian, 3-speed clutch, Millford sidecar, perfect order; £60.—Box 545, c/o The Motor Cycle. [X2226]

1915 T.T. Indian and Sidecar, 5-6h.p., 3 speeds, sporty turnout; £55 cash, no offers, bargain.—12, Heath Rd., Hounslow, W. [6806]

7-9h.p. 1914 3-speed T.T. Indian, fast turn of speed in condition like new; £35; guaranteed.—Wauchope's, 9, Shoe Lane, London. [7161]

INDIAN, 1915, 7-9h.p., 3 speeds, kick-starter, electric equipment, speedometer, run 1,324 miles; £60.—Warren's, 6, Warren St., London. [7170]

1915 Indian, 7-9h.p., clutch model, run 500 miles, unscratched; cost £65, price 40 gns.—Troward, 73, High St., Hampstead. 'Phone: 5392. [7232]

INDIAN, 1916 latest models in stock: your present machine can be taken as part payment.—Elce and Co., 15-16, Bishopsgate Av., Canonville St., E.C. [0479]

7-9h.p. T.T. Indian, clutch model, speedometer, in new condition; sacrifice, £35 for quick sale.—Barnes, 59, Church St., Shirley, Southampton. [X2359]

7 h.p. Indian, model F, luxurious combination, Power-plus, spring frame, speedometer, 1916, never been ridden; £95.—R. F. Ayscough, Penarth Hotel, Penarth. [X2210]

1914 Heude Special Combination, splendid condition; £55, or exchange B.S.A., James or Sunbeam.—Richardson, 9, Redcliffe Mews, S. Kensington, S.W. [7047]

1915 7-9h.p. Indian Combination, 3 speeds, Miller head lamp, Stewart alarm, also Indian electric lighting outfit and speedometer; £74.—W.S.F., 31, Coley Hill, Reading. [7129]

INDIAN, 1914, 7-9h.p., electric equipment, new Mills-Fulford coach sidecar, child's seat in front, condition as new; £55, or nearest offer.—J. D. Britton, 106, Philip Lane, Tottenham. [7017]

7-9h.p. Indian Combination, 1915, done under 3,000 miles; cost £93/10; just been thoroughly overhauled and sidecar painted; £75, or nearest offer.—Major Butler Harris, Loughton, Essex. [7016]

1914 Indian, 7h.p., spring frame, T.T. bars, electrically equipped, 2 speeds, clutch, speedometer, run 4,000, perfect condition; bargain, £45, or near offer.—William, Whitley Kiln, Reading. [7087]

INDIAN, 3½h.p., T.T., late 1915, special machine, 3-speed, clutch, kick starter, speedometer, Blaxton, Lucas lamp set, 70 m.p.h., mileage under 1,000, as new; must sell; sacrifice £59.—Quertier, Fordingbridge, Salisbury. [7056]

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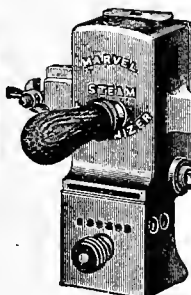
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4 h.p. B.S.A. Combination .....	£80 0
7 h.p. HARLEY-DAVIDSON, electric equipment .....	£89 15
2½ h.p. 2-str. EXCELSIOR, 2-sp., and clutch .....	£44 2
Coach-built Sidecar for same .....	£10 10
8 h.p. British EXCELSIOR, 3-speed .....	£78 15
2½ h.p. ALLONS, 2-speed .....	£42 0
4 h.p. CALTHORPE Combination .....	£70 7
6 h.p. ENFIELD Combination .....	£89 5
2 h.p. CALTHORPE-J.A.P., 2-speed .....	£37 16
2 h.p. CALTHORPE, 2-stroke, 2-speed .....	£32 11
2½ h.p. Lady's CALTHORPE, 2-speed .....	£35 14
ROVER Sidecar .....	£15 15

Write for Full List of Shop-soiled and Second-  
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## SELECTIONS.

	Cash. £ s.	De- posit. £ s.	And 12 Pay- ments of £ s.
1915 4 h.p. B.S.A., Mod. H 50 0	0		
1914 6 h.p. A.J.S. and Canolet, hood and screen .....	70 0	25 0	80/8
1914 8 h.p. ZENITH, c/shaft, and Sidecar ..	62 0	18 0	75/10
Mod. J 7-9h.p. HARLEY- DAVIDSON, electric equipment, new; cost £86 15s. ....	76 13	26 13	89/7
1913 3½ h.p. ARIEL, 3-sp., and Sidecar .....	40 0	10 0	53/9
1914 3½ h.p. SUNBEAM, 3-speed, and Sidecar ..	65 0	25 0	71/8
1914 8 h.p. BAT and S-car	55 0	15 10	71/8
1915 4½ h.p. EXCELSIOR, soiled only .....	59 0	—	—
1915 CALTHORPE-J.A.P., 2-speed, new; cost £36 15s. ....	32 0	10 0	40/-

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Complete with supply of all necessary materials.  
Price—motor cycle and cycle car size, 13/9; car  
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Garage: 12, Tottenham Mews, W.C.

'Phone: Museum, 1240.

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London."

## MOTOR CYCLES FOR SALE.

## Indian.

**INDIAN 1916** 5hp. Combination, 3-speed, dual controlled clutch, Binks and Indian carburettors, Lucas rear light, head light, horn, speedometer, spare valve, tube, plugs, and others, mileage 1,900; cost £96, must sell before 24th; £69.—Brooke, Joiner, Queen's Mill Rd., Huddersfield. [X2366]

**INDIANS in Stock**—Latest models, Powerplus combinations, sporting Powerplus 3 speeds models, standard 7hp. overhead inlet combinations, with lighting set, the famous 5hp. 3-speed double-purpose mount, and 7hp. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [X2339]

## James.

**JAMES No. 6** Combinations in stock; no waiting.—Colmore Depot, 261, Deansgate, Manchester. [6026]

**COLMORE Depot**, 261, Deansgate, Manchester, have in stock complete range of James motor cycles. [X2189]

**1916 James**, 2-speed, 2-stroke, £38/12/6; another shop-soiled, horn and lamp fitted, bargain, £33.—Bunting, Harrow. [7146]

**1915 1/2 3/4hp. James Twin**, only used since Christmas, 3 speeds, and clutch, front and rear light, horn, etc.; £52/10.—Box 554, c/o The Motor Cycle. [X2189]

**1914 1/2 James**, 4 1/4hp. 3-speed, Watford speedometer, De Luca Canoelet sidecar, with silencer, wind screen, 3 lamps, many spares, mileage 4,000, magnificent turnout, like new; bargain, £52/10.—Burridge, High St., Watford. [6942]

## J.A.P.

**2 3/4hp. Jap-Matchless**, regular T.T. flier, grand condition; bargain, £20.—Bunting, Harrow. [7147]

**4hp. J.A.P.** Senspray, Bosch, P. and H. Brooks, very fast; £30, no offers.—70, Sussex Rd., Holloway, N. [7179]

## J.E.S.

**J.E.S.**, 1914, 1 1/2hp. 3-speed Sun cycle, fork girders, splendid order; £12.—68, Clevedon Rd., Weston-super-Mare. [X2225]

## Juno.

**JUNO**, 2 1/2hp. 2-stroke, late 1915, splendid condition, only wants seeing; evenings; offers.—Strong, 41, Halstow Rd., East Greenwich. [7184]

## Kerry.

**3 1/2hp. Kerry-Abingdon**, 2-speed, sidecar, spares, cover, 3 tubes, etc.; must sell, joining up; £25.—Hine, Mills, Hemlock. [X2274]

**KERRY-ABINGDON**, 3 1/2hp. 2 speeds, clutch, and cane sidecar, very good condition; £25.—Chaufeur, Stubbings, Maidenhead. [7173]

**1913 Kerry-Abingdon**, 3 1/2hp. a, coachbuilt sidecar, Sturmer-Archer 3-speed (new), B. and B. carburettor, recently thoroughly overhauled; £38.—89, Grange Rd., Ramsgate. [7196]

**3 1/2hp. Kerry-Abingdon**, 1912, 2-speed and clutch, chain and belt drive, good tyres, enamel and plating nice condition, running well; bargain, £22/10.—Thomson, 85, Church Rd., Willesden. [7223]

**KERRY-ABINGDON**, 3 1/2hp. 1912 overhauled, hand clutch, long wicker sidecar, new Dunlop belt, etc.; Jones speedometer, lamps, etc., splendid condition; bargain, £23, or exchange lightweight.—3, Albert Quadrant, Weston-super-Mare. [X2224]

## Levis.

**1916 Levis**, new, but soiled; £25.—Pitts' Stores, Red-ditch. [X2407]

**LEVIS 2 1/2hp.**, 1915 1/2, new condition, all accessories; £23/10.—95, High St., Bexley, Kent. [X2017]

**1916 Levis Popular**, £32, in stock.—Williams, A.J.S. Agent, Chapel Ash Depot, Wolverhampton. [X2295]

**LEVIS**, 1914-15, 2-stroke, splendid order throughout; £17/10.—Speechley, 45, Church Rd., Acton. [7243]

**COLMORE Depots**, Birmingham and Leicester, for delivery of all models of Levis motor cycles from stock. [6804]

**LEVIS 1915 Popular Models** from stock; £32 cash, 50 or gradual payments.—Wauchope's, 9, Shoe Lane, London. [7151]

**LEVIS**, 1916, 2 1/2hp., shop-soiled only; £33, list price £40, bargain.—Colmore Depot, 31, Colmore Row, Birmingham. [X2151]

**LEVIS 1916 Popular Model**, 2 1/2hp.; £32; in stock; immediate delivery.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [7004]

**LEVIS Popular**, new; special bargain; cannot repeat: £28 cash; gradual payments 2%.—Referee Cycle Co., 332, High Holborn. [0764]

**LEVIS Popular Model**, new, but slightly shop-soiled; £26/17/6, special bargain.—Wilkins, Simpson, and Co., 11, Hammersmith Rd., London. [6998]

**1915 Levis Popular**, little and carefully used, lamp, horn; £20, complete, bargain.—Frank Boden, Confectioner, Matlock Bath, Derbyshire. [X2316]

**LEVIS 2 1/2hp.** Popular, brand new, 1916, complete with lamps, horn, and numbers; owner noticed; £20.—Gorleston, St. Albans Rd., Kingston. [X2335]

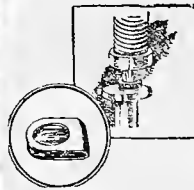
**LEVIS 1915 (December)** Popular, perfect condition, speed, Brooks saddle; 25 gns.; owner going abroad.—L. J. Wallis, Royal Oak, Biggleswade, Beds. [X2305]

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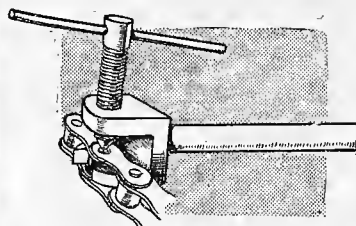
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## MOTOR CYCLES FOR SALE.

## Levis.

**LEVIS**, 1916, Popular models.—We are sole Oxfordshire agents, and can deliver correctly taped Popular models at once.—Layton's Garage, Bicester, Oxon. [X2399]

**LEVIS 2-stroke Motor Cycles**, latest 1916 models.—Sole London and district agents: Cars and Motor Sundries Ltd., 175-177, Shaftesbury Av., London, W.C. Phone: 1432 Regent. [0711]

**LEVIS, T.T.**, 1915, 2 1/2hp., specially tuned engine, Harcourt radiators, speedometer, lamps; any trial; ride 50 mile to intending purchaser; £22.—H.P., 87, Broad St., Swindon, Wilts. [X2306]

**LEVISES**, Populars £32. No. 1's with 5in. field gear £47/10; actually in stock; deferred payments by arrangement; also 1915 Popular model and accessories, £24; deferred payments by arrangement.—Lamb's 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7031]

## Lincoln-Elk.

**LINCOLN-ELK**, 1913, 3 1/2hp., Bosch, Druids, running order; £15/10.—1, Ebber St., Wandsworth. [X2257]

## L.M.C.

**L.M.C.** absolutely new, 2-speed countershaft gear, chain and belt; £52/10; guaranteed.—Colmore Depot, 31, Colmore Row, Birmingham. [X2150]

## Martin.

**MARTIN-J.A.P.**, 2 1/2hp., adjustable pulley, forced feed Amac, Bosch, nearly new tyres and belt, lamp and generator, new tools, etc.—Vincent Motor Co., Rugeley, Staffs. [X1760]

**MARTIN-J.A.P.**, latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear, £37/10.—Sole London and District Agents, Cars and Motor Sundries, Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [0760]

## Matchless.

**MATCHLESS-J.A.P.**, 1915, 6hp., clutch model, accessories; £46.—Riley, South Av., Stourbridge. [X2308]

**MATCHLESS**, 1912-13, 6hp., clutch model, with cane sidecar; £31; good condition.—Biggs, 16, Carthew Villas, Hammersmith. [7188]

**MATCHLESS**, 1913, 3 1/2hp., clutch, Hutchinsons, Pedley, lamps, speedometer, looks new; bargain, £39.—65, Herbert Rd., Plumstead. [7086]

**1914 7-9hp. Matchless Combination**, perfect, all accessories; cost £100.—Best cash offer to F. N. Jones, Stottesdon, Cleobury Mortimer, Salop. [7057]

**BARGAIN**—Matchless, 8hp., 2-speed, F.E. kick-start, coachbuilt sidecar, hood and screen, perfect running; £38.—H., 125, Blackstock Rd., London, N. [6992]

**8hp. Matchless Combination**, twin belts, 2-speed, electric lamps, horn, condition tyres, etc., as new; cost over £100, accept £59.—Westley, Outfitter, Hales St., Coventry. [X2404]

**MATCHLESS Combination**, 6-8hp., 1913 1/2, B. and R. carburettor, Gradua, Bosch, lamps, all in running order; £50.—T. Spencer Boorman, Mill House, Stanford-le-Hope, Essex. [X2203]

**MATCHLESS**, 8hp., Millford Radial wheel sidecar, Lucas horn, Jones speedometer, spare tyre, most excellent condition; bargain, £47/10.—Freeman, 151, Barton St., Gloucester. [7042]

**MATCHLESS-J.A.P.**, 8hp., 2-speed, twin drive, coachbuilt combination, accessories, spares, splendid condition; any trial; £45, nearest offer.—Michellangels, 5, Charleville Rd., W. [7018]

**MATCHLESS**, 1915, 8hp., beautifully fitted up, and in fine order; deferred payments if desired; £73/10.—Lamb's 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7037]

**MATCHLESS 1914 8hp. Combination**, M.A.G. engine, 3 lamps, Dunhill 3-wing screen, accessories, etc.; excellent order throughout; 70 gns.—F.W.T., 32, Victoria Rd., Whalley Range, Manchester. [X2182]

**MATCHLESS**, 1913, twin J.A.P., 2-speed, with Dunhill coachbuilt 2-seat sidecar, fine passenger outfit, recently overhauled; worth easily £50, accept £42.—Layton's Garage, Bicester, Oxon. [X2400]

**MATCHLESS-J.A.P.**, 8hp., 90 bore, overhead valves, just returned from complete overhaul, clutch, Bosch, Senspray, Badcock's, etc.; £35, or exchange, Zenith wanted; offers.—Allen, 214, Hendon Broadway, London. [6956]

**MATCHLESS**, 1914, J.A.P. twin, 6hp., overhead valves, T.T. all red, sporting model, in guaranteed perfect condition throughout, new tyres, new Pedley belt and grips, 1915 Amac; £36, offers.—Hubbard, Lake Hotel, Oulton Broad, Lowestoft. [X2285]

**1914 Matchless**, 6hp., and sidecar, overhauled, Dunlop tyres new, cost 50/- each, lamps, generator, horn, spares, and accessories; trial run 100 miles if necessary; £43, or nearest offer.—Smith, 1, Charlton Villa, Staines Rd., Bedford, Middlesex. [7138]

## Minerva.

**LOW Position Minerva**, magneto; £8.—Sounders, Mays Lane, Saxilby, near Lincoln. [6949]

**MINERVA**, 2 1/2hp., mag., B.B. carburettor, splendid chamber, faultless, low; £11/10.—200, St. James's Rd., South Remondsey. [7020]

# THE MOTORCYCLE

ESTABLISHED IN 1903

AND FOR OVER SIX YEARS THE ONLY PAPER SOLELY DEVOTED TO THE PASTIME

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## Sixpence a Gallon on Petrol.

**S**IXPENCE per gallon on petrol must be regarded as a success from a motor cyclist's point of view. The stir created when the new rates of taxes on motor cycles, varying from £2 2s. to £4 14s. 6d., were promulgated has no doubt had good effect, for not a week has passed but this journal has been able to provide evidence of the unfairness of the proposals. Moreover, as will be recalled, *The Motor Cycle* addressed a letter to the Chancellor of the Exchequer, pointing out that his proposals were "unjust and inequitable," and quoted some of the anomalies which existed. Stress was laid upon the fact that "motor cyclists would be called upon to pay £4 14s. 6d. for their machines, whereas several makes of small light cars weighing four or five times the amount of a motor bicycle would get off for £4 4s." Examples showed that basing taxation upon the bore of the engine only is quite unfair in the case of motor cycles. We then suggested the alternative of 10s. 6d. per horse-power, one horse-power being represented by every 125 c.c. capacity. The Chancellor promised that our proposals would receive attention.

Mature consideration has brought about the adoption of a petrol tax which, we think, will meet with general satisfaction. Motor cyclists can congratulate themselves that, in addition to owning the cheapest motor vehicle ever devised, they likewise possess the most economical mount, so far as petrol consumption is concerned.

Straws show which way the wind is blowing, and a paragraph on page 542 of our issue of June 8th, reproduced below, would convey to the observant man more than we could blatantly announce. It ran:

### A Petrol Tax Only.

To abolish the new taxes and put an additional tax on petrol alone seems to be the most favoured system, according to our post bag. At present, no matter whether a man uses 500 miles of roads in a year or 5,000, the tax is the same. Road

damage, too, would be automatically adjusted, as the heavier vehicle naturally consumes a much greater quantity of fuel.

## The Economy and Utility of the Motor Cycle.

**T**HIS issue mainly consists of a tribute to the sidecarrier, a branch of the industry that owes its development chiefly to the war. The commercial motor cycle was, of course, in existence several years ago, but not until August, 1914, did it receive the attention it deserves both from manufacturers and users. To a great extent this recognition of the sidecarrier was in both cases compulsory. When war broke out many manufacturers concentrated half-heartedly on commercial editions of their touring machines with a view to keeping their works fully occupied, and it was, perhaps, only the advent of Government control that put a stop to much greater activities in this direction. On the other hand, the small tradesman has been forced to adopt the sidecarrier by reason of labour shortage and the wholesale commandeering of horses. It is safe to say that those traders who have been driven by force of circumstances to the commercial three-wheelers are regretting now that they did not adopt them much sooner, so satisfactory from an economical and utilitarian point of view have been the results obtained.

Besides dealing at some considerable length with the purely commercial vehicle, we are able to provide abundant evidence in this issue of the many advantages of the motor cycle either as a solo or passenger machine in general business and professional use. Not the least attractive features, too, are the proofs of the economy of the motor cycle, either for touring or business. In view of the additional sixpence per gallon on petrol, this is of paramount importance, as the motor cycle is easily the most economical vehicle on the road in the matter of petrol consumption.



# A Mount for the Medical Man.

## SOME ADVICE ON THE CHOICE OF A SUITABLE MACHINE.

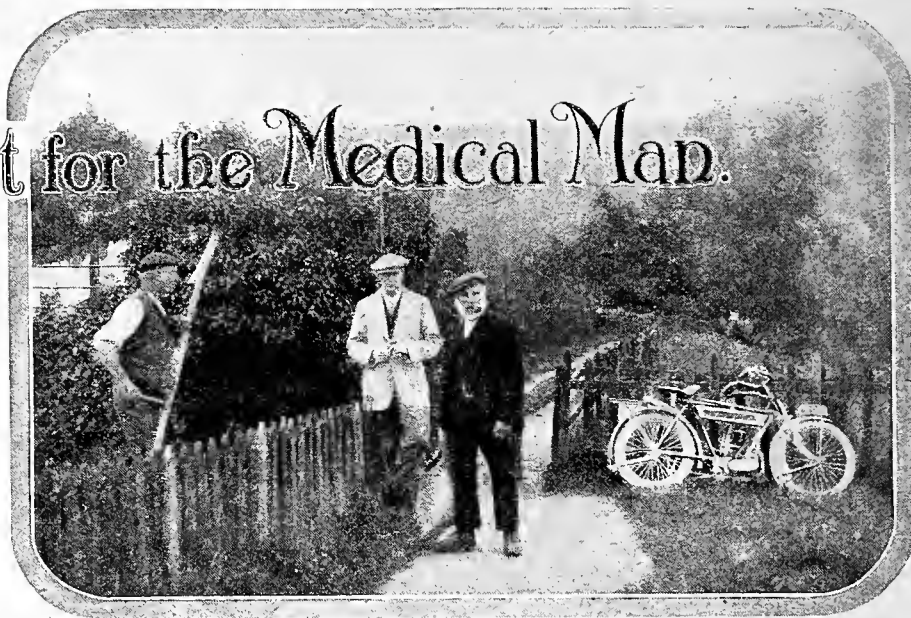
**M**OTOR cycles have met with such universal popularity among doctors, and the advantages they offer as a quick and economical way of getting about are so obvious, that in this article it is hardly necessary to quote professional opinion as to their value. This might, moreover, be misleading, for almost every doctor who uses a motor cycle is quite convinced that his make of machine is "the one and only" for the work, whereas one man's medicine might in reality prove another man's poison. A more useful purpose than bolstering up the cause of the motor cycle might be served by giving a little professional advice which may be of assistance to those who are "still contemplating" the use of a two or three-wheeler. After all, it is not the man who uses a machine we are after. It is (1) the absolute Juggins, so far as motor cycles are concerned, who wants to buy but who does not do so because he is not quite sure what to buy; and (2) the man who has employed a car, but who wishes to employ a motor cycle in order to economise.

Doctors, therefore, may be divided into two classes as motor cyclists: (1) The man who does everything by motor cycle, and (2) the man who does most things by car, but who employs a motor cycle occasionally and chiefly for the use of his manservant.

### The Usual Question.

"What make of machine would you recommend?" When the machine is used as the sole means of progression, and is in use practically all day winter and summer, it is to be noticed that most medical men employ the  $3\frac{1}{2}$  h.p. single-cylinder chain-driven machine, which is the handiest and probably the most dependable class of mount one could recommend. A "big twin" sidecar outfit, however, requires a minimum of attention for actual service rendered, and can be depended upon for giving one year's sustained use without attention in the way of renewals or repairs over a distance of, say, 4,000 miles.

At 6



A chat with local celebrities. Incidentally, the two elderly villagers give one the impression that they have little need for a doctor.

### The Question of Weight.

Unless one's riding includes a good deal of hard riding with numerous non-stop journeys of, say, six or seven miles, this class of mount is, perhaps, superfluously heavy and powerful. As a runabout for use in a thickly populated district something more suitable might be arrived at, but in the mountains of the North, particularly by the mechanical-minded Scot, the heavy mount has met with general popularity. This is probably because it is more comfortable to ride and more easy to control than the average lightweight.

The influence of environment is not, however, so noticeable to-day as it was a few years ago, for the lightweight of to-day will do more than the heavy touring mount of yesterday.

As regards cost of upkeep, I am inclined to think that there is very little in it as regards the various solo machines. A badly tuned "baby" will cost more to run than a well-tuned  $3\frac{1}{2}$  h.p. single, many of the babies possessing truly infantile thirsts, whereas the average  $3\frac{1}{2}$  h.p. four-stroke is very economical in this respect. Unquestionably the cheapest machine on the road is the small four-stroke, but the difference between one and another, excluding depreciation, is so slight that it need hardly enter into one's reckonings. Luck, and one's own mechanical abilities, are the deciding factors.

Heavy sidecar outfits naturally cost more to run than solo mounts, but the convenience of being able to carry all one's equipment, including waterproofs, dusters, etc., is well worth it.

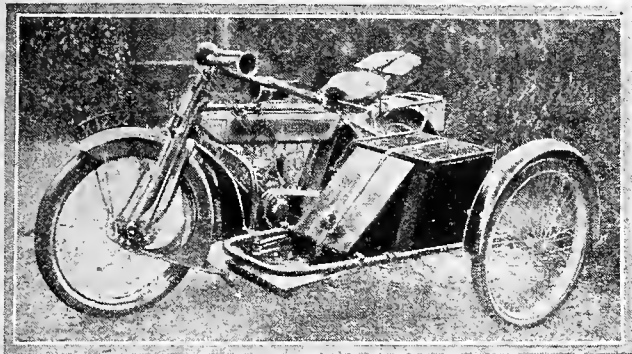
One big advantage of the modern  $3\frac{1}{2}$  h.p. three-speed single is that, while it will take a sidecar anywhere, it is ideal for solo use during the summer.



A useful carrier when delicate instruments and breakable goods are to be carried. It will be observed that it is attached to the saddle, and is therefore sprung with the rider.

**A Mount for the Medical Man.—**

The lightweights and semi-lightweights are limited to solo use, but these machines are marvellously efficient, and will stand any amount of hard and continuous riding. The great advantage of the two-stroke lies in its handiness; it can be paddled off from the saddle, left by the kerb like an ordinary pedal cycle, and pushed in and out of the motor house four or five times per day without undue exertion. For doctors who propose using their machines only occasionally, and maintaining them chiefly for the use of a manservant, the lightweight is unquestionably the



A light and serviceable third wheel attachment. Mounted on a Lewis Empire lightweight chassis, the large box is for carrying a medical kit, and the small sloping box in front for carrying tools and spares. The body can be removed in two minutes and the light coachbuilt passenger body substituted.

thing. Impress upon the man that he has a cycle to look after in addition to a motor, and all will go well. In a really mountainous district a change-speed gear is necessary, and with this fitment the machine should climb anything in reason.

**Small Four-stroke Engines.**

The small four-stroke twin has met with considerable popularity among professional men, as well it might. If properly tuned, a machine of this class consumes an almost negligible quantity of fuel, is speedy on the level, and delightful to ride at all times. At low speeds it is more pleasant to handle than the two-stroke in average tune, but generally it requires slightly more attention.

The small four-stroke "single," on the lines of the A.J.S. lightweight, possesses most of the advantages of the "big single," except that it cannot be used for sidecar work. Those who have no mechanical aptitude, but who particularly desire something light, economical to run, and absolutely dependable, would do well to consider the possibilities of the small single-cylinder four-stroke.

**Springing and Vibration.**

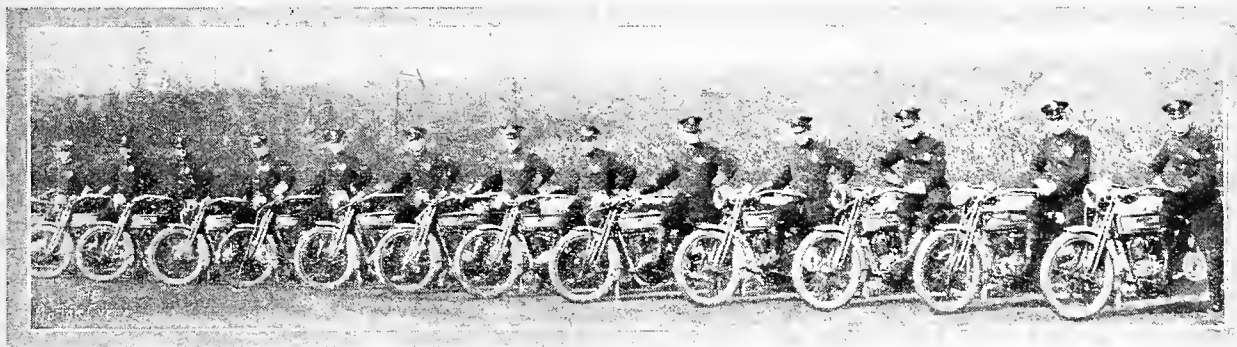
After the war many motor cycle manufacturers will build spring frame models, and these will undoubtedly find a ready sale among doctors. To the man who knows nothing about motor cycles it may be pointed out that, given two machines exactly alike, except that the rear wheel of one is sprung and on the other it is not, then the former will be far the more comfortable to ride. Hence a spring frame motor cycle makes a special appeal to a medical man. This is borne out by the experiences of a Chester physician who has been using a spring-framed machine (the Edmund-Jap) as a tender to his car. He has found that the use of a rigid frame bicycle in his professional duties has been greatly limited by the vibration on pot-hole roads, and this is not noticed on a spring frame machine.

**The Desirability of Leg Shields.**

There is but one obstacle between the medical man and the motor cycle, and that is the ever-apparent necessity of having to don overalls. He observes the train of motor cyclists which filters from the cities during holiday times, and he decides that "if I am to be one of these I will wait till I can buy a car." But the makers of accessories have catered so liberally for the professional-man that there is no need for him to appear as one of these. As regards one's lower members, which present the greatest difficulty, half the nuisance is removed by the use of clip-on leggings, which can be donned or shed in a few seconds.

Winter mud is easy to contend with by equipping one's machine with leg shields, etc. The dust of summer presents greater difficulties. The winter shields are then worse than useless, for the disturbance they create in the atmosphere causes the dust to whip in from the rear, and the only practical way is to use cotton overalls, which can be washed periodically.

H.M.B.

**YET ANOTHER USE FOR THE MOTOR CYCLE.**

The Detroit, U.S.A., police motor squad and their Harley-Davidsons. Nearly all the big cities of the United States have a section of motor cycling police, one of their duties being to prevent scorching in the towns and suburbs. As a result of this they are commonly referred to as "speed cops."



### Two-wheeled Machine Gun Limbers.

Some of our readers have been struck by the ingenious Hendee machine gun outfit, illustrated in our issue of June 8th, and wonder that a similar idea did not occur to our own service. I am in a position to state that the War Office turned down a similar notion submitted by a private inventor comparatively early in the war. Presumably they were of opinion that the detachable two-wheeled carriage, whilst doubtless admirable for mobile warfare, such as Mexico may furnish, was hardly suited to the stationary campaign in Flanders. Possibly they were also influenced by the large quantity of the other pattern (fixed sidecar) already in use or on order, and did not wish to multiply patterns with the consequent complication of depot stocks and replacement work.

### Daylight Saving in Rural Districts.

I don't know whether Hodge is sly or stupid, but a number of farm labourers have evidently misunderstood the new time laws. I have met several unlighted farm carts in country lanes since the clock was put forward, and I advise readers who are traversing rural lanes to be on the *qui vive*. Unlighted carts were always pretty common off the main roads, as the inhabitants of a village usually know which is the local constable's courting night, and don't trouble to light up when he is at the other end of the parish; and now that lamps are not required until so late, yokels seem to have written them off as useless luxuries in war time. Anyhow, it helps one to realise a little more of what some D.R.'s go through.

### Four-stroking.

Several readers show by their letters that they have never genuinely comprehended the nature of four-stroking. The charges inhaled by a four-stroke engine are of approximately similar nature; and if one is too rich, too weak, or too impure to explode, it is expelled unburnt on the next exhaust stroke, and succeeded by a following charge which is sure to be practically identical in character, so there is no reason for a four-stroke engine to eight-stroke. The sequence of events on a two-stroke engine is quite different, as (a) a number of factors may vary the nature of successive charges within limits, and (b) an unexploded charge is less completely scavenged than an exploded charge; in a two-stroke engine the exploded charge is exhausted very largely by its own expansion, and the piston, so far from assisting in the first period of the exhausting process, is descending. A charge which remains unexploded has comparatively little expansive force, and a large percentage of it remains in the cylinder, and combines with the vanguard of the next body of gases rushing up the transfer pipe to form the succeeding charge. So whenever the following charge happens to correct the mixture of the un-

exploded charge, the engine must fire regularly at each alternate revolution until the mixture regains the correct ingredients. It would be interesting to know from one of the experts who has studied carburation with glass carburettors and piping whether the advance guard of a fresh charge from the carburetter usually consists largely of air. Otherwise, why does the mixture of (a) a rich unexploded charge, and (b) the front end of the succeeding charge, usually give a satisfactory explosion?

### Gear Boxes v. Flexibility.

The universality of variable gears, coupled with the tendency towards luxurious and weighty specifications, is destroying or at least reducing one of the pleasantest features formerly characterising the average motor bicycle. When a  $3\frac{1}{2}$  h.p. machine scaled under 180 lb., it was a very flexible machine to drive on a single gear. No doubt occasions were numerous when one sighed for a change speed gear, and other heavy fittings; but on easy undulating roads devoid of really severe hills, the light single-gear  $3\frac{1}{2}$  h.p. was—and still is—a most delightful machine to drive. On throttle control alone the speed could be varied from at least 5 to 45 m.p.h. on the one gear, and the machine accelerated well. The sensations were analogous to those of driving a 50 h.p. six-cylinder car, so far as speed range on one gear was concerned. One of the newest  $3\frac{1}{2}$  h.p. machines I have ridden is fully up-to-date in all its specification, and scales 3 cwt. Intrinsically it is at least as flexible as the old-timers, or even more so; for, thanks to a well-plotted set of gear ratios, it can be driven at any speed from 2 to 60 m.p.h. But it is only on our best main roads that it can be kept on a moderately high gear for any distance; ratios of from 4 to  $5\frac{1}{2}$  to 1 are useless to it when slowed against an insignificant gradient; and it does not really enjoy picking up from a slow on the level with a gear of 5 to 1 or more in operation. Its absolute flexibility may exceed that of the old single-gear T.T.  $3\frac{1}{2}$  h.p.; but in actual riding its practical flexibility seems to be much less, because one is always dropping on to some such ratio as 7 or 8 to 1 in order to recover the engine revolutions. Its engine is infinitely superior to any of the old-time 500 c.c. patterns, and its deficiencies are wholly ascribable to its tremendous weight. I can quite comprehend the taste of a man who still clings to a light T.T. mount, with a fixed gear or a Philipson pulley; the ultra-heavy, ready-for-any-emergency tourist machines of to-day, many of which could pull a sidecar up Honister if they could secure a tyre grip, deprive us of one of the main delights of motor cycling—the sense of infinite power available at the twitch of a finger. There should always remain a small market for the lighter and livelier types.

## Women's Work in the Army Service Corps.

By ANNA BLAKISTON.

FOR some time women have been employed in certain branches of the Army Service Corps so that men might be released. I was a forwarding supervisor in the forage department for several months, and was engaged in different parts of Yorkshire. Although the work *can* be done with an ordinary push bicycle, I need not mention here the many advantages of a motor cycle. As a matter of fact, for six weeks I could not have done my work without my motor cycle, as I was riding forty-odd miles a day. And such a distance on a pedal cycle is beyond the capacity of an ordinary woman when it forms but an item of the day's work. On a motor cycle, on the other hand, it is simply a pleasing interlude in the day's proceedings.

### Hay for the Army.

For all-weather riding on roads which vary from fair to very bad indeed, a lightweight is preferable, unless one is either a trick rider or a sidecarist. Even with my little lightweight I had several bad skids. I might add I was never any the worse for them. I was very surprised the first time the bicycle

skidded absolutely round. It was a frosty morning, and the road was covered with a thin, slippery layer of ice, so really my little two-stroke Revere had every excuse for its behaviour. Next time out I was more cautious.

My work consisted of making arrangements at various railway stations for sending off clover, hay, and straw for Army use in England and abroad. I then had to supervise the loading, sheeting, and roping of the

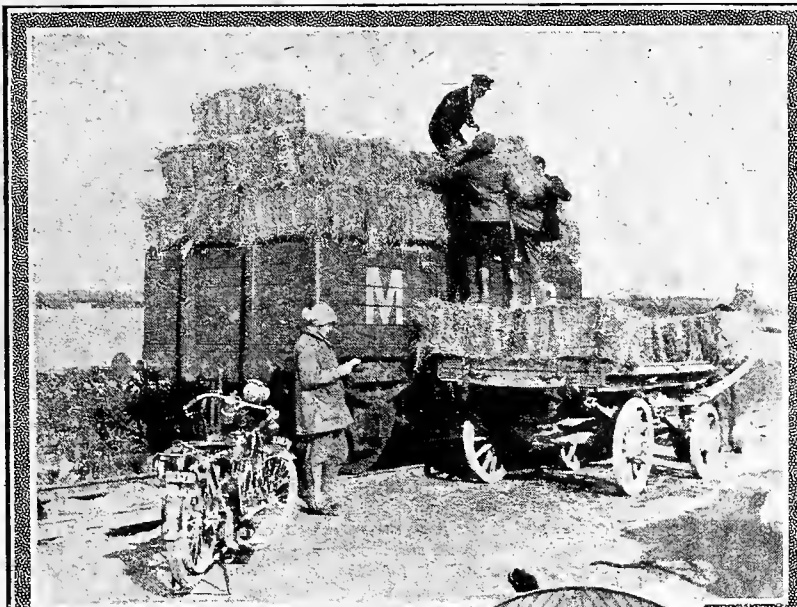
trucks, label the trucks, and advise on Army forms—all very simple when you know just how it's done! One does come across porters who flatly refuse to load in the way you require or to sheet and rope just when you tell them to. Well then you must remember that you are doing a man's work, and it is up to you to assert your authority and see that the work you have undertaken is properly carried out by mere man.

The photographs show loading at one of the stations and the steam baler. May I add that the baler I was attached to at that time was reputed to be the fastest baler in Yorkshire.

(Top) Loading clover.

(Middle) The writer of the accompanying article, Miss Blakiston, in her capacity of forwarding supervisor in the A.S.C., talking to a bale supervisor. Her machine is a two-stroke Revere.

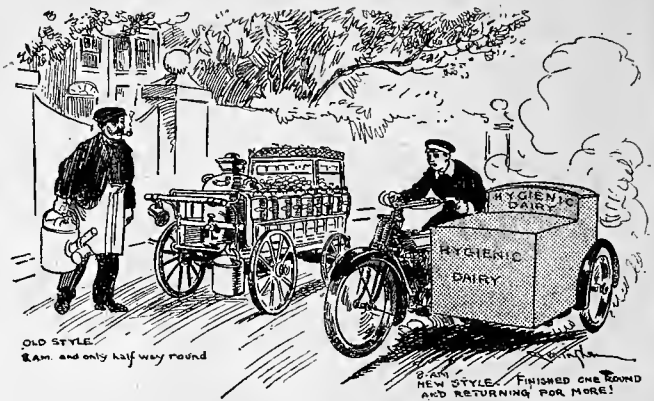
(Bottom) At the weigh-bridge. Giving the station-master the consignment note.





# THE SIDECARRIER ANALYSED.

Its Possibilities—Costs of Horse and Motor Compared—Suggested Body Designs for Different Trades.



**T**HE advantages of the motor cycle sidecarrier for trade delivery work are so many and important, and the new conditions arising out of the war are causing so many businesses urgently to require new methods of cheap and quick delivery, that the present moment is an extremely appropriate one to call attention to the value of the sidecarrier for all who have to make regular and quick deliveries over wide areas.

Great numbers of traders have had their horses commandeered for military purposes, in many trades business has been good and delivery requirements increasing, notwithstanding the war, so that new means of delivery are pressingly wanted. Small motor vans have been adopted by many, but there are numbers of smaller traders whose requirements do not warrant the purchase of a motor van, and for these the sidecarrier would be an eminently suitable proposition.

## The Question of Cost.

In the adoption of any new method the question of cost is one of the first for attention, and a consideration of the comparative figures of horse delivery and motor sidecarrier delivery, both as regards capital outlay and running expenses, should do much to convince traders of the great advantages of the motor cycle in all cases where large quantities of parcels have to be delivered and a good mileage covered. In this connection it is important to remember that a motor cycle delivery combination will do greatly more work than a horse and van. A couple of sidecarriers of only moderate capacity will do the work of three horses and light vans, while if a sidecarrier of large capacity be employed, such as is now obtainable, a single motor cycle delivery combination will do the work of two horses and carts, covering a greater mileage, and delivering more goods with greater speed and efficiency, and more satisfaction to both the trader and his customer.

## Capital Outlay.

The capital necessary to expend on a motor cycle delivery combination capable of doing the work of two horses will be about the same as the amount involved in the purchase of a single horse and van, and if a second-hand motor cycle with a new sidecarrier be secured through a dealer the cost will be appreciably reduced and the dealer, who is a skilled expert, will be willing, as a rule, to set up the combination and give his personal guarantee of the serviceability and perfect running order of the combination at the time of delivery.

## Running Expenses.

For tradesmen delivering parcels of goods sold which vary in quantity from day to day the following comparison of the approximate figures of weekly running expenses of horse delivery by two horses and vans and motor cycle delivery by one motor cycle will be useful, and will show

*This article is written mainly for the man who is contemplating the adoption of mechanical transport for the delivery of light goods, and it sets forth the particular claims of the motor cycle sidecarrier—a type of machine unequalled for the rapid and economical delivery of loads up to 3 cwt. at a time. It should be read in conjunction with another article in this issue embodying the actual experiences of users of these handy three-wheelers in various trades.*

the service to be expected from a motor cycle delivery combination. In practice it will probably happen that at times the sidecarrier will be either overloaded or underloaded and the journeys shorter or longer than those specified, but the secret of success is to have a sufficiency of work and a good mileage.

## WEEKLY COST OF HORSE DELIVERY.

Horse keep: Fodder and bedding, stable materials, farriery, and veterinary ex-

penses, for two horses at 16s. per week ...	£1 12 0
Wages: Two men at 24s. per week ...	2 8 0
Horse renewals at £8 per horse per annum, say 3s. per horse per week ...	6 0
Repairs and depreciation: Van and harness at £5 each per annum, say 2s. each per week ...	4 0
Stable rent at 5s. per van and horse per week ...	10 0
	<hr/> £5 0 0

In these figures nothing is charged for occasional hire of spare horse to replace animals sick.

## WEEKLY COST OF SIDECARRIER DELIVERY.

Petrol and oil (sixty miles per day) ...	£1 3 0
Wages: one youth ...	1 1 0
Tyres (at £7 per set for about 4,000 miles) ...	12 6
Depreciation and repairs ...	7 6
Total ...	<hr/> £3 4 0

In twelve months the expense of horse delivery will be £260, and of motor cycle delivery £166 8s., or a saving in favour of the motor cycle amounting to £93 12s., practically the cost of the outfit.

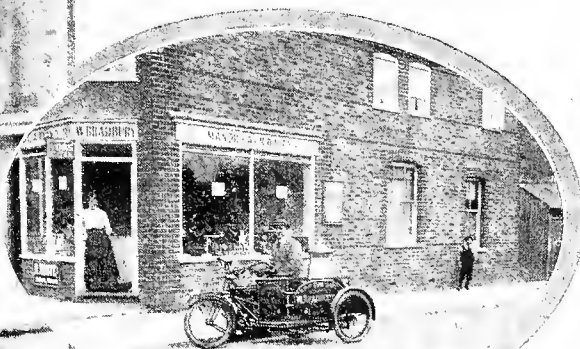
For this expenditure of £3 4s. weekly the 6 h.p. delivery combination will easily make six journeys daily, each averaging five miles out and home, and carrying thirty parcels of an average weight of 10 lb. = 180 parcels a day, or 1,080 parcels per week, at an average cost of under 3d. per parcel. It should be borne in mind, too, that the expenses of motor cycle delivery are only incurred if there are goods to deliver, but all the expenses of the horse go on by night and day whether the animal is rendering service or not.

## Obtaining a Sidecarrier Outfit.

Although motor cycle manufacturers, deeply engaged with the demand for munitions, are turning out but few motor cycles for the present, the tradesman who is willing to give motor cycle delivery a trial need have no difficulty in obtaining a new machine and sidecarrier.

Most of the sidecar manufacturers also are able to give delivery of commercial sidecarriers capable of being used with second-hand motor cycles of all makes. A practical plan for the tradesman is to apply to his local motor cycle

# SIDECARRIERS IN EVERY TRADE.

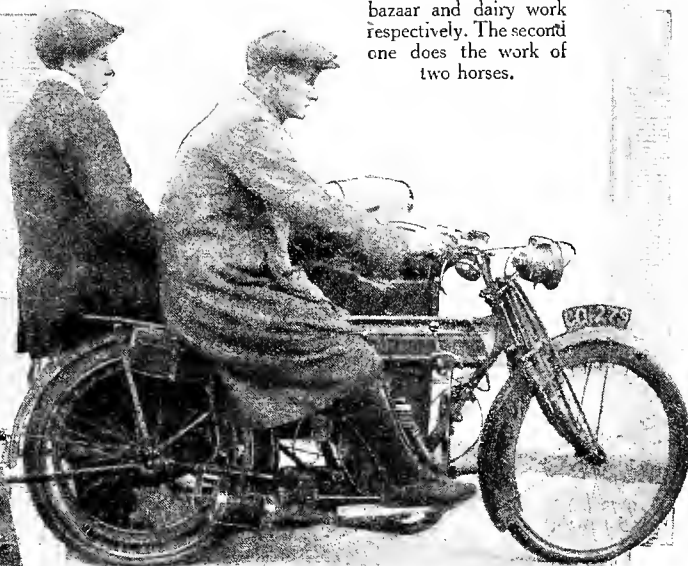


2

1 and 2.—Enfields in bazaar and dairy work respectively. The second one does the work of two horses.



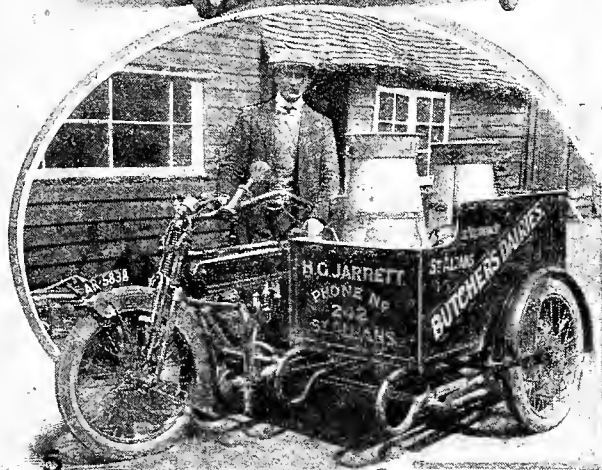
3



4

3.—P. & M. traveller's sample carrier.

4.—New Imperial with box body.



5

5.—A dairyman's Chater-Lea.



6

6.—A good load for the Scott.

### The Sidecarrier Analysed.—

agent, or one of the dealers who advertise in *The Motor Cycle*, stating his delivery requirements, and to receive the agent's offers and recommendations. If he has not got in stock what is exactly suitable, he will probably be in a position to obtain prompt delivery of it from his contracts with the makers, or from his knowledge of riders who have reliable machines for disposal. In any case, the services of the agent or dealer will be invaluable to the tradesman who is not a motorist, and will ensure the installation of the outfit under the best conditions for success.

### Some Points on Practical Guidance.

Here are a few points of practical guidance which will help the trader in making his choice. A  $3\frac{1}{2}$  h.p. outfit will be suitable for loads up to 2 cwt., and a 5 or 6 h.p. twin engine machine if it is intended to take heavier loads, say averaging  $3\frac{1}{2}$  cwt. The machine for heavy work should have chain transmission, the chains either wholly or partially enclosed. Great strength is required in the couplings between the machine and the sidecarrier. The couplings should have at least four points of connection, and the lugs to which the couplings are attached should be brazed on to and form part of the machine. The dealer will see that the outfit is sent out perfectly aligned, and the driver must see that proper alignment is always kept to ensure easiest running and avoid undue strains and possible breakages. A  $3\frac{1}{2}$  h.p. outfit, motor cycle and sidecarrier complete, may cost upwards of £70, a 5 or 6 h.p. outfit £90 to £100. It is more to the point to get the right article than to save a pound or two in first cost.

The sidecarriers offered by sidecar manufacturers are, as a rule, without internal fittings; but the manufacturers will make fittings to suit the buyer's wants. The motor cycle sidecarriers also are of good size—much larger than those generally used with pedal cycles. The tendency is towards larger sidecarriers of greater capacity, which is a desirable feature when large numbers of parcels are required to be carried. The Harley-Davidson sidecarrier measures 62in. long by 19½in. wide, and 19½in. deep; the Enfield sidecarrier, though not so long, is 22in. deep and 25in. wide, and, where required, sidecarriers of larger dimensions can be obtained. open with a top lid and door at one end, but, for some trades it would be well to have doors at each end and half the top formed to open, the remainder of the top being a fixture to secure strength, and the sidecarrier can be made in this way if desired.

The following suggestions of useful internal fittings for different trades, as shown by the accompanying diagrams, may be found of service to help the buyer in specifying fittings to suit his trade.

### The Draper's Sidecar.

Fig. 1 shows an arrangement suitable for drapers and departmental stores where heavy goods and light parcels that must not be crushed may have to be sent by the same sidecarrier. The fittings comprise two rows of shelves, adjustable as to height, running the length of the carrier and moving on runners so that the shelves can be drawn out and all parcels be easily accessible without disturbing others.

Heavy goods can be carried at the bottom, lighter packages on the shelves. Each shelf can be divided in the centre so that half the shelf can be withdrawn from either end. Large and tall millinery boxes can be accommodated by removing one of the half shelves, and a basket packed with china by removing two of the half shelves.

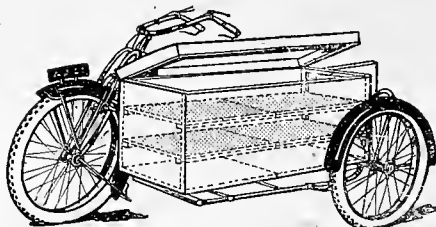


Fig. 1.—Design for a draper's carrier.

and packing in packets at the warehouse and to send cases to branches containing supplies of packets of teas, sugars, and the like all weighed and packed ready for delivery to customers. The rest of the shelves can be replaced, and the sidecarrier used with the shelves packed with parcels for delivery to customers as described in fig. 1.

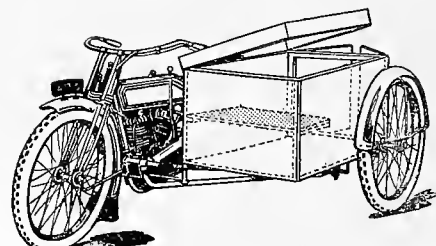


Fig. 2.—A grocer's sidecarrier, showing shelves removed to allow the carriage of bulky packet goods.

top of the sidecarrier, which will ensure that the goods are delivered in perfect condition on the hottest days. One of the shelves is shown made of strong galvanised iron wire arranged lattice-wise, which allows the cold air to descend.

### The Butcher's Sidecarrier.

A serviceable arrangement of fittings to suit the butcher, poulterer, or fishmonger is shown in fig. 3. For these trades it is useful to have the sidecarrier lined with sheet zinc with riveted and soldered joints, which will enable the interior to be kept perfectly clean and sanitary without the necessity of frequently scrubbing the inside woodwork. A small ice box, marked A, should be arranged at the top of the sidecarrier, which will ensure that the goods are delivered in perfect condition on the hottest days. One of the shelves is shown made of strong galvanised iron wire arranged lattice-wise, which allows the cold air to descend.

These are only a few samples of internal fittings, and sidecar manufacturers will supply others for any special trade if desired.

### The Sidecarrier for Laundry Work.

In fig. 4 a special arrangement of the sidecar chassis is shown, permitting a large detachable skip to be mounted in place of the sidecarrier body for use by laundries. The full hamper can be packed by the hotel or receiving office and loaded on to the carrier in a few moments in exchange for an empty one, which also can be packed at leisure and exchanged in its turn.

This is also a good arrangement for bakeries who regularly deliver bread to agents and dairies; for flour and grain merchants who send small sacks and boxes of cereals to shopkeepers; also for wholesale tobacco dealers with branch shops, and even for railway companies at suburban and country stations where numbers of parcels are received by rail for local delivery.

As a rule, it may be taken that it will prove satisfactory and profitable to adopt sidecar delivery in any business where there are parcels to be delivered regularly over a radius of some miles from the shop or warehouse, and where the present cost of delivering such parcels approximates to £100 per annum. Traders who under these conditions are confronted with the war-time problem of difficult deliveries, owing to the commandeering of horses, will find it satisfactorily solved by the motor cycle and sidecarrier.

HARRINGER.

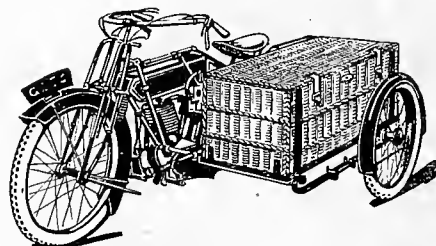
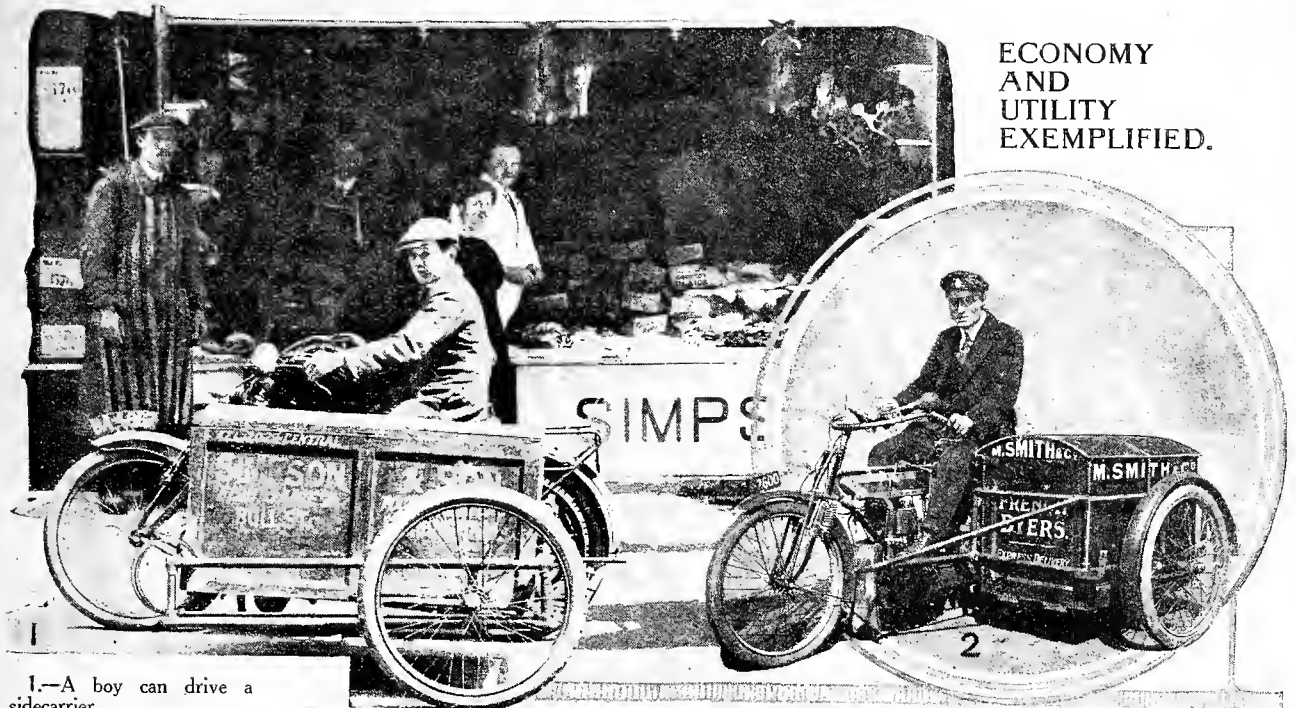


Fig. 4.—A laundry sidecarrier. The basket is detachable and interchangeable with others.



ECONOMY  
AND  
UTILITY  
EXEMPLIFIED.



1.—A boy can drive a sidecar.

2.—After four years' service.

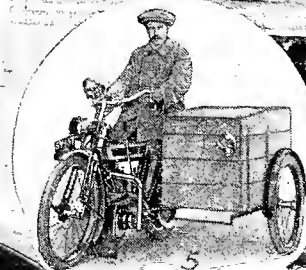
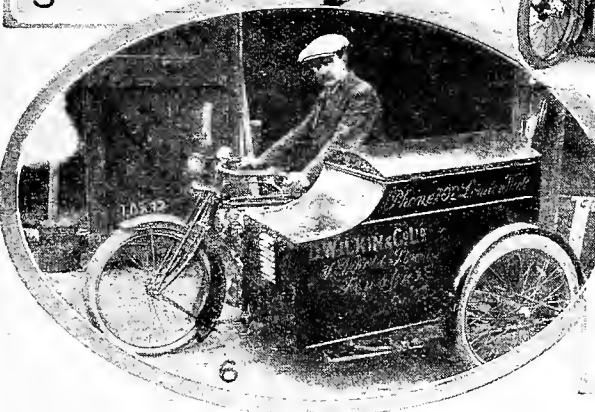
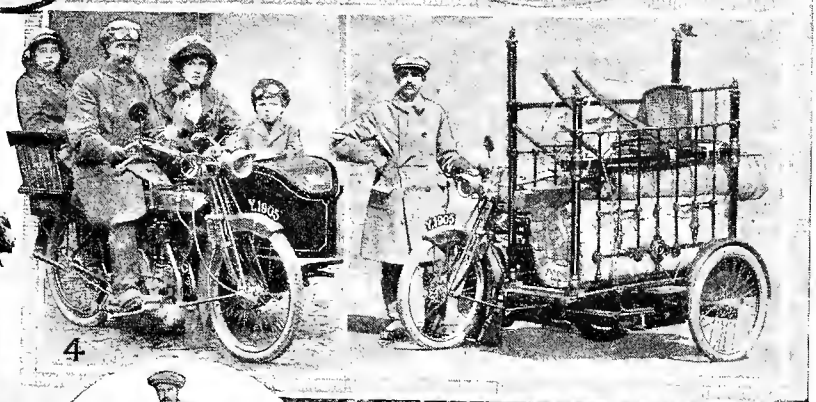
3.—A girl enjoys side-carring.

4.—A Premier for touring and business.

5.—An L.M.C. in Scotland.

6.—One of a fleet of six Triumphs.

7.—A Rudge in use at Bristol.





## "DELIVERING THE GOODS."

Experiences of Small Tradesmen with the Modern Light Delivery Vehicle.

**A** GOOD example of the satisfactory results that can be obtained from a sidecar outfit fitted with interchangeable commercial and touring bodies is provided by the  $3\frac{3}{4}$  h.p. Ivy-Precision owned by Mr. P. J. Chandler, grocer, etc., of Chelmsford Road, Old Southgate. This is a 1913 machine, fitted with two-speed N.S.U. gear, and it has been in almost daily use for eighteen months.

The dimensions of the box carrier are 2ft. 10in. long, 1ft. 8in. wide, and 1ft. 5in. deep. It is not at all a lengthy job to take this body off and replace it with a touring one. With the latter body Mr. Chandler has had some very enjoyable runs, including a five days' tour in which 650 miles were covered. But it is as a commercial vehicle that the owner has realised its worth, and since his staff of assistants has been greatly reduced owing to enlistments he has found the outfit more useful than ever.

On No. 2 spirit petrol consumption varies between sixty and eighty miles per gallon, according to whether the machine is on straightaway runs or delivering goods, and therefore constantly starting and stopping.

### Driven by Circumstances to a Sidecarrier.

**Q**UITE a number of tradesmen using sidecarriers would not be doing so but for the war. The wholesale commandeering of horses and depleted staffs have made many turn their attention to the three-wheeler, the result being a great wish that they had been introduced to the advantages of this handy little vehicle earlier. A Birmingham wholesale and retail grocer, Mr. C. H. Newlands, of St. Luke's Road, was almost driven to adopt a sidecarrier owing to circumstances of the above nature, and he is delighted

*Roughly speaking, the field of the delivery sidecarrier among tradesmen can be divided into two sections—the man in a comparatively small way of business using one or two machines, and the big stores which use them as tenders to large capacity vans. On this and the following pages several instances are given of the successful application of the sidecarrier by the small tradesman.*



A  $3\frac{3}{4}$  h.p. Ivy-Precision sidecarrier used by a Southgate grocer. The body shown can be changed for a touring one in a few minutes.

with the experiment. His experiences are as follow:

"A few years ago I used a horse and trap for my outside work. The cost at that time of keeping a horse was at least half what it is at the present, but my chief difficulty was to obtain a reliable driver. I therefore sold the turnout, and made arrangements with a contractor, soliciting orders personally on a pedal bicycle. Some of my journeys are long, and I often felt tired on returning, and little fit to commence counter work. This induced me to purchase a lightweight O.K., and so commenced my motoring experience. This little machine was an excellent mount, and rendered good service. I returned from my journeys fresh and in much shorter time.

"I had got over one difficulty, but was still in the position of thousands of tradesmen, i.e., worried over the problem of delivery. The hiring system was always a source of anxiety. Then came the time, owing to the war, of the almost impossibility of getting men at all, and one exceptionally busy week I had no means of delivery, and was obliged to go to the expense of hiring a taxi. I was determined that this experience should not be repeated, and my thoughts became centred on a Ford van. However, a friend to whom I mentioned the matter suggested a sidecarrier, pointing out the possibilities of an alternative touring body for week-end and holiday trips. "As an experiment I purchased a  $4\frac{1}{2}$  h.p. B.S.A. and passenger sidecar. Being not over-confident of the success of the commercial body, I got a carpenter to convert a strong foreign match-case into a temporary delivery box. I attached this to the B.S.A. sidecar chassis, and the bodies can be changed in about ten minutes. The outfit is proving much more successful than I ever imagined. I solicit my orders with sidecar, and use the box body for



### THE ADVANTAGES OF THE CONVERTIBLE SIDECAR.

(Left) B.S.A. used by C. H. Newlands, of Birmingham, for business on work days. (Right) The same bicycle with touring body attached for Sundays and holidays.

**"Delivering the Goods."**

delivering. At first it seemed strange delivering the goods personally, but I find customers appreciate the personal attention, and I have the satisfaction to know they have their goods in perfect condition; even eggs I carry without breakage.

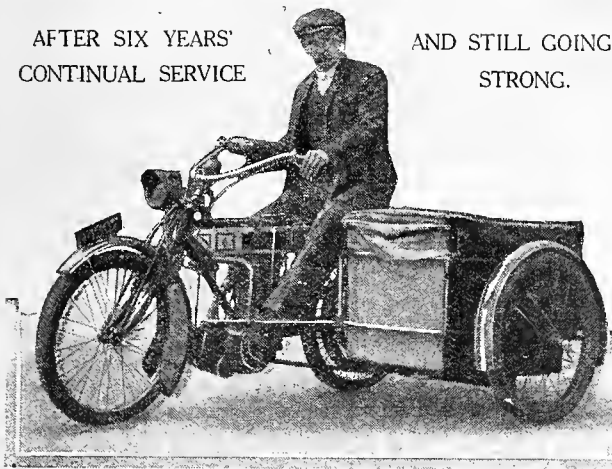
"I cannot speak too highly of the B.S.A. My average loads are between 2 and 3 cwt., and with this weight I climb all the local hills, never using low gear except in traffic. Petrol consumption in traffic and delivery with constant starting and stopping is about 45 m.p.g. On a tour with my wife and two children we have managed 65 m.p.g. I cannot state definitely my weekly running expenses, but approximately I consider I am saving 15s. per week over previous forms of delivery."

**Laundry Delivery by Motor Cycle.**

**T**HE experiences of the Westwood Laundry, of Oldham, with a sidecarrier are instructive, in that they have been obtained with a machine that has been in constant use for nearly six years. The outfit, a 4 h.p. two-speed belt-driven Bradbury, was supplied to Mr. Andrew, of the Westwood Laundry, in August, 1910, and since then it has been used on an average four days a week, the weekly petrol consumption being three gallons. A remarkable testimony to the machine is that, according to the owner, only about £4 has been spent during this lengthy period on repairs and renewals, but this cannot include tyres.

AFTER SIX YEARS'  
CONTINUAL SERVICE

AND STILL GOING  
STRONG.



This 4 h.p. Bradbury sidecarrier has been used by an Oldham laundry for this lengthy period with satisfactory results.

**Half the Cost of a Horse and Van.**

**M**R. E. SELLS is a confectioner of Chesham, and uses a B.S.A. sidecarrier in his work with most satisfactory results. He has also a touring body which can be substituted for the commercial body in ten minutes. The dimensions of the carrier are 5ft. x 1ft. 8in. x 2ft., and nearly one hundred 2 lb. loaves can be carried at one time. The machine has now covered over 3,500 miles, and it has given no mechanical trouble.

The machine is a 1914  $3\frac{1}{2}$  h.p. three-speed B.S.A., and though there are many bad hills in the Chesham district Mr. Sells tells us that the machine climbs them all well, and it is seldom that the bottom gear is used. This is interesting, as showing that before buying a sidecarrier one should consider carefully the question of horse-power, so that a too powerful machine (meaning increased petrol consumption, etc.) is not bought. On the other hand, it is just as bad to buy a machine of too low power.

As regards running cost, Mr. Sells contends that his B.S.A. sidecarrier is just about half that of a horse and van. The machine does about 50 m.p.g., which is good for a delivery round entailing frequent starting and stopping. The weekly mileage is about 100, and on this basis Mr. Sells reckons 6s. 6d. for petrol and oil and 3s. 6d. for tyres, repairs, and renewals per week.

In addition to the actual saving in cost of running, a round that with a horse van took five and a half hours to



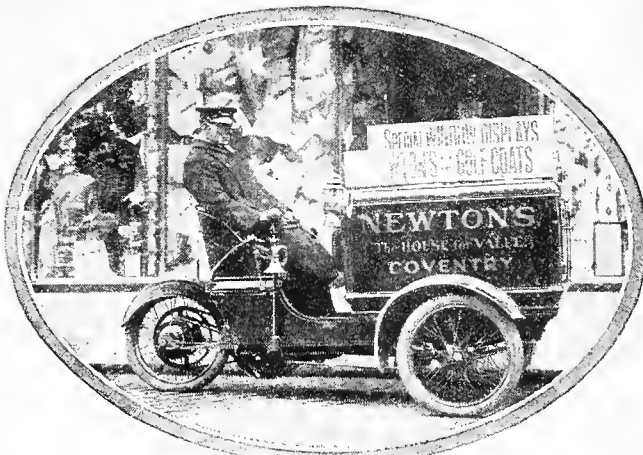
A smart-looking sidecarrier that in itself is a travelling advertisement for the owner, a Chesham confectioner. It is a B.S.A., and the experiences of the owners, E. Sells and Son, are recounted on this page. At week-ends and holidays a touring body takes the place of the one shown, the changing only occupying ten minutes.

cover is done with the B.S.A. in three and a half hours. This is a considerable saving, and an enterprising tradesman is thus enabled to extend the sphere of his business.

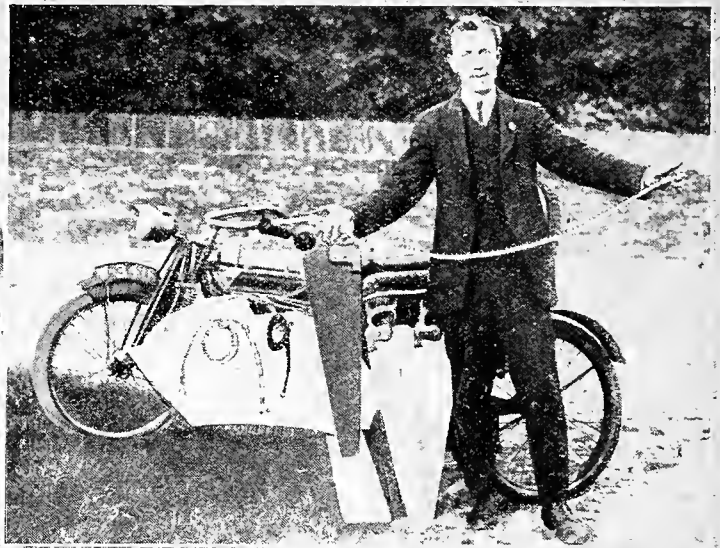
**A Well-proven Type.**

**A** SPECIAL Number, such as this issue of *The Motor Cycle* dealing with the commercial three-wheeler, could not be considered complete without some reference to the well-tried Auto-Carrier. This make of machine had well-established itself before the sidecarrier became known, and there is no getting away from the fact that motor cycle manufacturers in pushing sidecarriers after the war will meet with keen competition from this quarter.

Auto-Carriers are to be found all over London and the big provincial cities, and, being engaged on so many different trades, to find one typical example is not easy. However, we consider that the machine illustrated is a good instance of a typical Auto-Carrier. This is an actual show model, having been exhibited at the 1912 Commercial Vehicle Show, and since then it has been in continuous use by its owners, Messrs. Newtons, of Coventry. Its work consists of the rapid delivery of parcels in city and suburbs, and the daily mileage averages about twenty. It has stood up to the work well, and it looks as good as new now. The useful load limit is 6 cwt., and on this point the Auto-Carrier type of vehicle scores over sidecarriers which carry up to 4 cwt.



A typical Auto-Carrier—a make of machine that has been very successful. The one illustrated has seen four years' continual service for Newtons, Ltd., drapers, of Coventry.



A Rex sidecar engaged on war work. It belongs to C. H. Blakeley and Sons, of Sheffield, a quantity of whose Government work is done by outside help. The Rex is used for collecting saws, etc., made by the firm. In the right-hand view the rider is holding up a French band saw used for cutting down the trees in the firing line by hand.

#### A Four-year Old Machine Adapted for Light Munition Work.

THE following experiences of a Sheffield firm show what a machine that has passed its youthful days will do: "A month ago we were dependent on the caprices of an elderly pony in charge of an elderly and 'awkward' old man. We lost touch with our outworkers, and frequently delay of supplies lost us valuable time in the works.

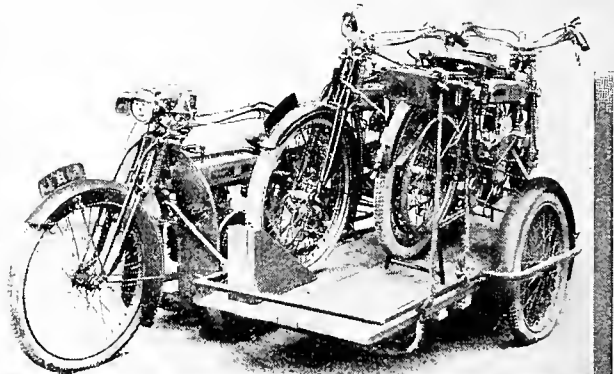
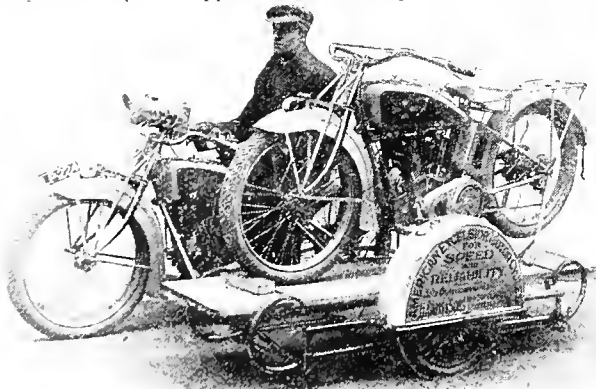
"Now through the medium of a 4 h.p. 1912 Rex with sidecar adapted for our special needs we have been able practically to reorganise the business. A few minutes' run gives us that personal grip with the suppliers of raw material, our sub-contractors, and our customers, of which every business man realises the importance. We are also able promptly to requisition or despatch raw material or finished goods up to 2 cwt. We still need the old pony, but having the sidecarrier enables us to arrange the former's journeys much more economically.

"Being War Office equipment manufacturers, the manufacture of which involves a great number of processes and a variety of fittings, our problem was not only to secure a prompt delivery of supplies, but to keep in touch with

the workers in each process, so that no time was lost in one waiting upon another.

"When the Rex arrived we were absolute novices, but read up our subject furiously in 'Motor Cycles and How to Manage Them.' Our selling friend gave us a trial run and a few hints one evening, and we have learnt the rest by the help of a few blisters and bruised knuckles. We could not say how many times we have attempted to start without turning the petrol tap on, and made the equally silly mistake of leaving the priming cup open. Such things always occur when you are most anxious to impress friends. But actual experience is the quickest way of learning—when pressed for time, if one has an involuntary stop, more is learnt in ten minutes than in a three-guinea course of lessons.

"As regards cost, we cannot give any definite figures, our experience not being sufficiently lengthy. A rough estimate is that the cost works out about half to two-thirds of that of a pony and dray. We know that it is a considerable saving week by week. Besides, the machine is not 'eating its head off' when not in use. Although we desired to economise, our main thought was to get work done, and get it done quickly." W.M.B.



The utility of the motor cycle could not be better exemplified than by these illustrations of motor cycles being conveyed on boarded sidecar chassis. They also bear good testimony to the robustness of the modern machine. Both photographs show outfits used by traders for the conveyance of new models, that on the left being an American Excelsior used by the London agents, Harris and Sons, and that on the right a Douglas used by that firm's London house.

# A CASE OF ECONOMY.

The Running Costs of Motor Cycle, Sidecar, and Car compared.

Cost of Petrol. Train Fare per person.

On 5 gallons of petrol	{	A 2½ h.p. motor bicycle covers 600 miles	}	16/3	{	£	s.	d.
		A 4 h.p. " " " 450 "				2	10	0
		A 6 h.p. sidecar " " 335 "				1	17	6
		A 10 h.p. light car " " 190 "				0	15	10

**E**CONOMY is a word to conjure with. In peacetime it is practised by most sensible people, but in war time the necessity of studying every economy is of paramount importance. A motor cycle is actually cheaper to run than travelling by train; small wonder, then, that the open road is preferred to a stuffy railway carriage. One hundred miles on a gallon of spirit—quite an ordinary performance for a motor cyclist—does not sound as if the petrol scarcity is due to the ravages of motor cyclists! Why, even in peace time some of the larger garages shunned motor cyclist clients because their custom was so small that the garages could not make enough out of them. This was common knowledge, yet motor cyclists are now classed with car owners in the appeals to stop motoring.

As it is clear from statements issued that the War Savings Committee are not cognisant of the cheapness of running a motor cycle, and do not realise that the cost is less than train fares, we have compiled figures from actual results which may assist in their enlightenment. Running expenses, as well as first cost, increase automatically as the size and the weight of a motor vehicle go up.

## Sidecar v. Car.

A motor bicycle and sidecar has always been a more economical vehicle than a motor car, not only in first cost, but also in the cost of running, and in these days of scarce and expensive

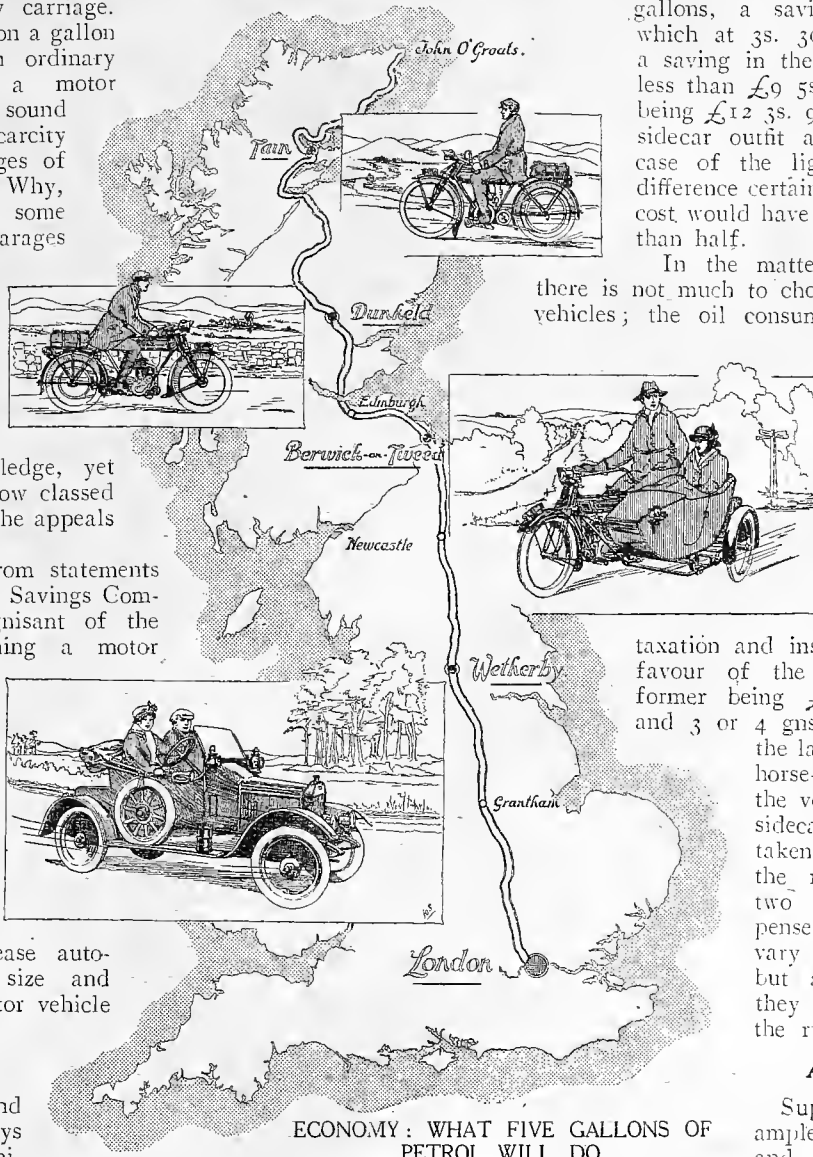
petrol the difference is more marked than heretofore. Taking 5,000 miles as a year's running, the petrol consumption on a 6 h.p. sidecar outfit and a 10 h.p. light car may be estimated at about 67 and 38 m.p.g. respectively. This means that the sidecar consumes 75 gallons of petrol while the light car consumes 13½ gallons, a saving of 57 gallons, which at 3s. 3d. per gallon means a saving in the cost of fuel of no less than £9 5s. 3d., the total cost being £12 3s. 9d. in the case of the sidecar outfit and £21 9s. in the case of the light car. A notable difference certainly! A year ago the cost would have been not much more than half.

In the matter of oil and tyres there is not much to choose between the two vehicles; the oil consumption is about the same in each case, and although light car tyres cost more than those commonly used on sidecar outfits they balance that cost by lasting longer.

The other yearly charges, taxation and insurance, are both in favour of the sidecar outfit, the former being £1 for the sidecar and 3 or 4 gns. for the light car, the latter varying with the horse-power and value of the vehicle. Roughly the sidecar insurance may be taken as one-half that of the rival vehicle. The two last-mentioned expenses do not, of course, vary with the mileage, but as yearly payments they must be included in the running costs.

## A Comparison.

Supposing, for example, a sidecar outfit and a light car each started from London for Edinburgh with a petrol supply of five gallons (costing 16s. 3d.), the light car would have to take in a fresh supply



## ECONOMY: WHAT FIVE GALLONS OF PETROL WILL DO.

Four vehicles—a 10 h.p. light car, a 6 h.p. sidecar combination, a 4 h.p. single-cylinder motor bicycle, and a 2½ h.p. lightweight—start from London, each with an allowance of five gallons of petrol. The light car comes to a standstill five miles south of Wetherby (190 miles from the start); the sidecar three miles south of Berwick-on-Tweed (335 miles); the motor bicycle three miles south of Dunkeld (450 miles); and the lightweight four miles north of Tain (600 miles).



## "THE BUTCHER, THE BAKER, THE CANDLESTICK MAKER"—

### EVIDENCE FROM ALL QUARTERS.

**DRY CLEANERS.**—"Have had a sidecar in use for three years with satisfactory results."

**YEAST MANUFACTURERS.**—A Finsbury firm has been using six sidecarriers since the beginning of the war. Results most satisfactory.

**WHOLESALE CONFECTIONER.**—A Sheffield man engaged in this business has a young woman to drive his sidecarrier. Cost of running motor cycle 5s. per week, horse and cart 16s.

**DAIRYMAN.**—From Slough we hear of a single outfit doing the work of two horses and carts. Has done thirty miles per day for the past twelve months.

**CHIMNEY SWEEP.**—An old tricar modernised by a sweep has been very successful. Cost of running, including three new covers, was £21 7s. 2d. in 1915.

**HOUSE DECORATOR.**—A Birmingham decorator uses a sidecarrier exclusively in his work. Averages forty miles per day. Motor does more work at less cost than that of a horse van.

**BILLPOSTERS AND ADVERTISERS.**—A Birmingham firm, with branches elsewhere, has discarded motor vans in favour of three sidecarriers with great success.

**A NEWS-AGENT.**—"I could not get on without my sidecarrier; it is much cheaper than a horse and cart."



Mrs. Browne: "Can you send me a large roast at once? My husband unexpectedly is bringing friends to dinner."

### A Case of Economy.—

before reaching Wetherby, in Yorkshire, or, to be exact, 190 miles from the start, whilst for the same expenditure in fuel the sidecar would get to within a mile or so of Berwick-on-Tweed, or 335 miles from London, the distance to Berwick being 338 miles. To make this example more complete, it may be stated that a lightweight solo motor bicycle with a consumption of 120 m.p.g. would have covered 600 miles on the same petrol allowance and reached a point between Tain and Bonar Bridge, less than 100 miles from John-o'-Groat's, while a 4 h.p. machine at 90 m.p.g. would be in the neighbourhood of Dunkeld.

Baines (the Butcher): "Certainly, madam; you shall have it in ten minutes."



The sidecarrier "eats up" the three miles to Browne's.



### Comfort and Convenience.

On the other side of the picture it must, of course, be admitted that the light car scores enormously in comfort, especially when the weather is wet and cold, and fortunate is the family man who can consider this point instead of the economical side of the question. In spite of its extra size, weight, and comfort, the carrying capacity of the light car is not superior to the family sidecar; in fact, it is questionable whether so many small passengers can be crowded on board without interfering with the free use of the various controls. The verdict, then, on the majority of counts is for the sidecar.



~ And Baines gets a well-deserved advertisement—and three new customers.

## THE NEW PETROL TAX.

A Further Sixpence per Gallon on Petrol. Abandonment of the High Taxes proposed in the Budget.

**W**E imagine that most motor cyclists will be pleased to hear that the proposed motor taxes have been abandoned in favour of an increased tax on petrol. It was, of course, recognised from the beginning that the country needed money and must have it, but the gross unfairness of the first proposals was at once evident to the motor cycling community, and consequently they aroused much opposition.

most use of their machines, and do most damage to the roads. Another point is that those who could not afford to pay a very largely increased tax, and would consequently have had to give up their machines altogether, will now only have to reduce their distances. This, as we have already pointed out, cannot be considered a great hardship.

### How the Tax will be Collected.

The procedure seems to be as follows: Every motor cyclist who has duly filled up his petrol census form will be entitled to purchase a certain amount of petrol during a certain time, and upon payment of the extra duty of 6d. a gallon (we presume upon the proposed monthly supply, but this has not yet been definitely stated) will receive a permit for the amount in question. If the stated number of gallons has not been purchased, the rider will be able to claim the return of a corresponding part of his payment.

On the face of it, it would seem simpler to add the tax to the price of the petrol, as is done at present, but the reason, apparently, is that the new tax is regarded—to quote the words of Mr. Montagu—as

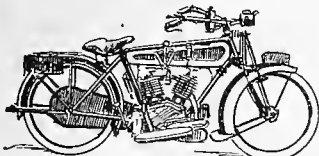
“a supertax on motor cars for the war, and for the war only, and in order to show that it is so we propose to levy it through a body which is going to issue permits under the Defence of the Realm Act.”

Thus we may assume that the present Inland Revenue licences and the tax of 6d. a gallon already on petrol are likely to be permanent, while the new tax will cease with the war.

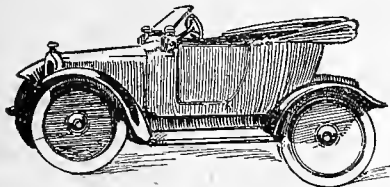
Doctors, veterinary surgeons, and users of commercial cars will receive an abatement of half the tax, but proposals to extend the same privilege to clergymen, road surveyors, and engineers in the employ of the local authorities did not meet with approval.

The new petrol tax is expected to produce £962,000 for a full year, but this year the yield is estimated at £397,000 less than the £800,000 which it was

### EXAMPLES OF TAXATION ABSURDITIES USED BY “THE MOTOR CYCLE” IN COMBATING THE PROHIBITIVE TAXES SUGGESTED IN THE BUDGET.



6 h.p. solo bicycle .. £4 14 6

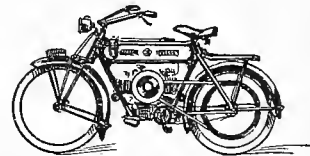


8 h.p. light car (twin-cyl., 72 mm. bore), £4 4 0

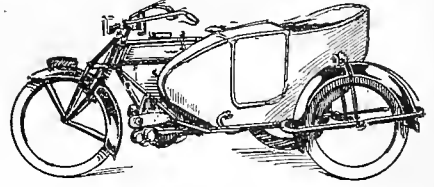
(From *The Motor Cycle* of April 13th, 1916.)

The new tax may fall heavily on some, but it is at any rate a fair tax, for it will fall most heavily on those who make

### EXAMPLES OF TAXATION ABSURDITIES USED BY “THE MOTOR CYCLE” IN COMBATING THE PROHIBITIVE TAXES SUGGESTED IN THE BUDGET.



2 1/2 h.p. (1910-1916) solo lightweight .. £3 3 0

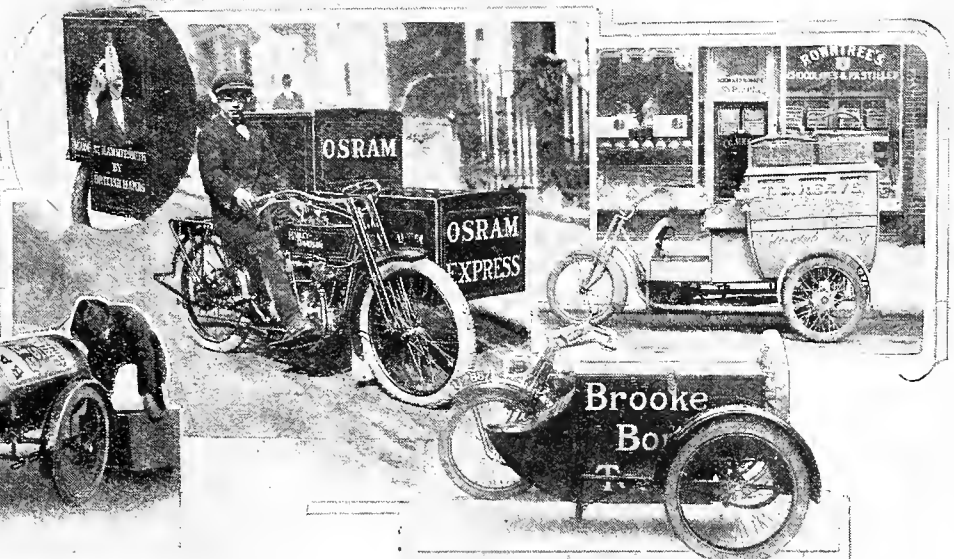
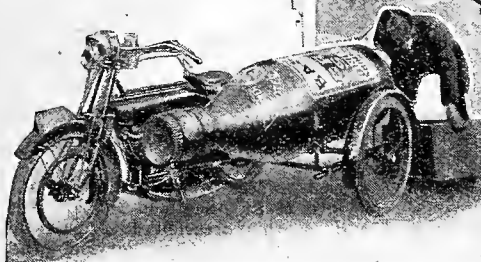


3 1/2 h.p. sidecar .. £2 2 0

(From *The Motor Cycle* of April 13th, 1916.)

hoped to get under the proposals just abandoned. There was, however, no proof that these taxes would have produced any permanent increase at all.

A smart Sidecarrier is a Travelling Advertisement for its Owners. Machines, such as those shown, attract attention, and so assist in bringing in fresh business.



### EXAMPLES OF USERS WHO RECOGNISE THE PUBLICITY VALUE OF THEIR DELIVERY MACHINES.

Of the above, the most striking, perhaps, is the Lea-Francis sidecarrier belonging to a Nottingham firm of wholesale bottlers of Bass. In the Osram Harley-Davidson good use is made of the back panel. The other two—a Wall and a P. and M.—though less striking, show neatness and smartness in bodywork and the lettering thereon.

# "THE MOTOR CYCLE" RECRUITING SECTION.

## VACANCIES FOR A LIMITED NUMBER OF MEN IN THE M.M.G.S.

This section was instituted with the sole object of assisting readers and directing them to the many different branches of the Army and Navy for which their special knowledge suited them. At the outbreak of war numerous letters reached us (and continue to arrive) from men at home and overseas possessed of motor engineering knowledge, explaining their difficulty in obtaining particulars of Specialised Sections (notably the Motor Sections), recruiting officers being invariably occupied by the demands of the line regiments. The Editor is Inspecting Officer for the M.M.G.S., Heavy Section, Machine Gun Corps, and R.E. Despatch Riders. Throughout, the work has been purely honorary, and no commissions have been accepted. To date, 9,914 readers have taken advantage of our proffered assistance.

**A**FTER a lapse there have been one or two letters from abroad during the last few days from men anxious to join the Motor Machine Gun Service. The training camps of the Heavy Section Machine Gun Corps are, however, full at the moment, so that for the time being applications for enlistment cannot be entertained. This also applies to transfers.

### Fifty Men Wanted for the M.M.G.S.

There are vacancies for fifty recruits in the Motor Machine Gun Service, and applications are invited from motor cyclists able to execute all running repairs, and preferably with sidecar driving experience. The conditions of enlistment in this branch have been detailed on this page on several occasions of late. The rate of pay is 1s. 2½d. per day, all found, the usual separation or dependants' allowance.

Applicants should state age, experience, Group or Class No., when called up, height and chest measurement, and enclose reference as to driving ability. The vacancies are for immediate enlistment only. All communications should be addressed to the Inspecting Officer, Mr. Geoffrey Smith, 19, Hertford Street, Coventry.

### Royal Engineers, Despatch Riders.

More names were added to the different waiting lists of the R.E. Signal Service last week—though a large number of men already being in training, the demand

for men is not pressing. Particulars of enlistment in this section are appended:

AGE.—19 to 38, ex-soldiers up to 45.  
MINIMUM HEIGHT.—5ft. 3in. in socks.  
CHEST MEASUREMENT.—Expanded (bare) 34½in. at least for age 19.  
ENLISTMENT.—As pioneers for duration of war. On joining, recruits will be given the rank of corporal.  
SERVICE.—As Government may think fit, i.e., home or abroad.  
PAY.—2s. 6d. per day, all found, plus 6d. per day engineers' pay after training. Usual separation or dependants' allowance. (Apply to any post office or recruiting office for particulars.)

Recruits must be good, capable motor cyclists, able to perform all reasonable running repairs likely to occur on the road.

All motor cycles are now supplied by the War Office.

A revised list of secretaries of the different R.E. recruiting areas was given in our issue of June 15th (page 561).

### The Technical Corps.

The position with regard to the Technical Corps is still as outlined in our last issue, page 584, recruits being wanted by the Admiralty Yacht Patrol (fitters for the Motor Boat Service), Royal Flying Corps, Army Service Corps, Motor Transport, and the R.E. Wireless Section. Readers who are car drivers or experienced mechanics who may have difficulty in obtaining particulars of the A.S.C., M.T., from their local recruiting officers, should apply to us for the address of the nearest A.S.C. examining officer. A score of readers in different parts of the country applied for this information last week.

### Royal Engineers, Railway Operating Division.

In addition to the vacancies in the Wireless Section of the Royal Engineers, mentioned in our last recruiting page, the War Office advise us of the need for men in the Royal Engineers' Railway Operating Division. Applicants for this section should have a good knowledge of the running and repair of internal combustion engines. The term of military training is reduced to a minimum, as men are required urgently for work at their profession in France. It is said that in this section men attain knowledge which will undoubtedly be most beneficial to them on their return to civil life, whilst the prospects of promotion are exceedingly good. Pay to commence 1s. 2d. per day. After twenty-eight days service and for a further period of thirty-two days this will be increased by 6d. for the ranks below sergeant. The usual separation or dependants' allowance. Applications should be addressed to Quartermaster-Sgt. F. J. Smith, Room 530, War Office, London, S.W.

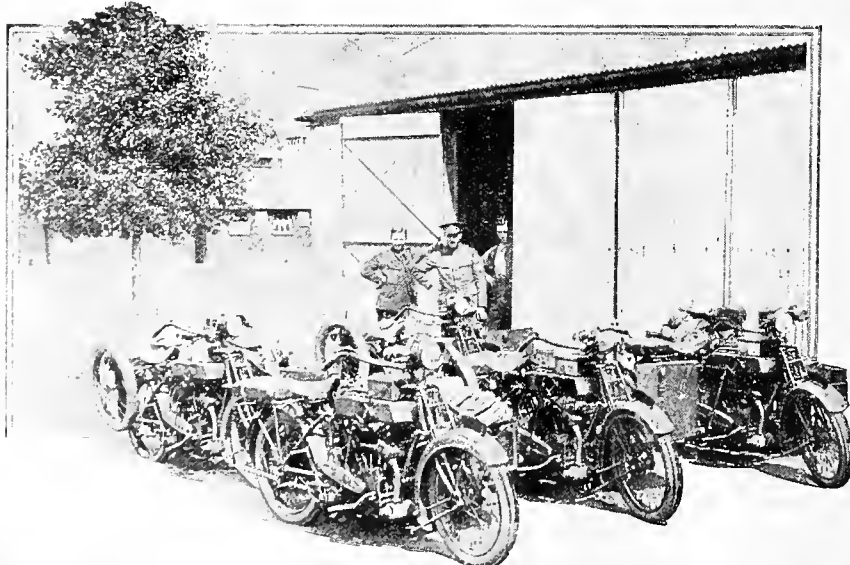
### A GOOD RECORD.

**T**HE firm of Messrs. C. A. Vandervell and Co., the well-known electrical engineers, has lent many of its principals to the service of their country. Capt. Frank Vandervell has lately joined the Heavy Section Machine Gun Corps, and is now an adjutant; Mr. Percy Vandervell is in the A.S.C. in France with the M.T., A.S.C.; while Mr. Harry Vandervell, who is a stockbroker in civil life, is in command of one of H.M. patrol ships. This is surely a good record for one family. Mr. C. A. Vandervell, the head of the firm, though not in either of the Services, is engaged in the manufacture of important Government supplies.

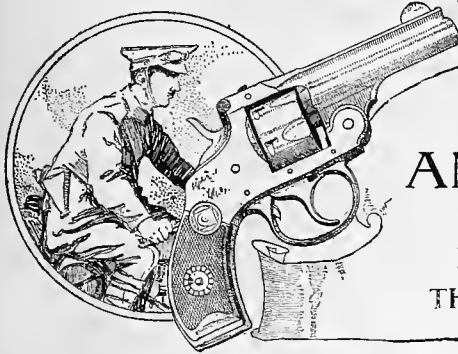
### ACTIVITY OF LIVERPOOL MOTOR VOLUNTEERS

**M**R. S. W. PHILLPOTT has infused new life into the Motor Cyclists' Section of the Liverpool Heavy Car Battalion of the National Motor Volunteers. The membership roll of the Motor Cyclists' Section has more than tripled during the past six weeks, and Mr. Phillpott has had to appoint an assistant officer, the man selected being Q.M.-Sgt. E. Thomas.

Last week new headquarters were opened at 183, Scotland Road, Liverpool, and on this occasion a sergeant of the Motor Machine Gun Service, who has seen active service, gave a lecture. There are still vacancies for motor cyclists living in Liverpool and district, and all particulars can be obtained from headquarters mentioned above.

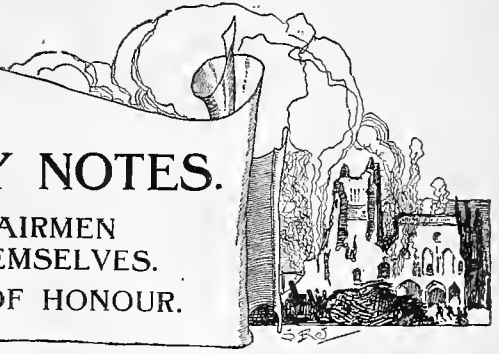


A group of Vickers-Clyno machine gun outfits outside one of the garages at the M.M.G.S. training centre.



## NAVAL AND MILITARY NOTES.

MOTOR-CYCLIST-AIRMEN  
DISTINGUISHING THEMSELVES.  
THE GROWING ROLL OF HONOUR.



### AIRMEN MOTOR CYCLISTS.

WE note with interest that Capt. H. Lister Cooper, R.F.C., has been mentioned in despatches. Lister Cooper will be recalled as a leading Triumph rider. Another exponent of this make of machine, also included in the list is Sec.-Lt. G. Boyton, one of the few R.F.C. observers to gain the distinction.

### ANOTHER MOTOR CYCLIST-AIRMAN KILLED.

ALL motor cyclists, and particularly those who knew him personally, will be sorry to hear of the death of John Gibson, who has been accidentally killed. He was originally a despatch rider on the East Coast, and after receiving a commission in the Devon Regiment and undergoing a course of training, was transferred to the Royal Flying Corps.

Gibson was well known in competition circles, having ridden a Triumph, Rudge, and Trump-Jap machines in various events, including the Tourist Trophy. Latterly he drove a Grand Prix Morgan.

Gibson was in turn both amateur and trade man, for though possessed of means inherited from his father, the late George Frederick Gibson, of Newcastle-on-Tyne, he was young, and was interested in garages at Moreton-in-the-Marsh, Stratford-on-Avon, and Torquay. He was one of the best types of sportsman, and was the first to acknowledge a better rider and a better machine. His loss will be keenly felt when competition days return.

Before transferring to the R.F.C., Gibson had a great fancy for the Motor Machine Gun Service, and it seems but a week or two ago that he called at our offices with regard to an application for a transfer to the M.M.G.S.

The unfortunate accident which cost Gibson his life will call to mind the

accident he suffered on the eve of the T.T. race of 1913, when he unluckily collided with a car which backed out of a side road, and for weeks lay in hospital at Douglas in a dangerous condition.

### HONOURS FOR MILITARY MOTOR CYCLISTS.

DESPATCH RIDER C. T. EVANS, formerly with the Rover Co., was mentioned for gallantry in Sir Douglas Haig's recent despatch.

Among the men to receive D.C.M.'s in the latest list is Acting L.-Cpl. O. Dufour Clark, despatch rider in the A.S.C. Dufour Clark, it is officially stated, has done exceptional work, and has never yet failed to deliver his messages, although often the errand necessitated his riding through a heavy fire zone.

### WELL-KNOWN RIDER KILLED.

WE are informed that the relatives of Lt. E. Baxter have been officially advised that he was taken prisoner, badly wounded, during the very gallant bombing attack recorded in these pages a few weeks ago, and died very shortly afterwards. Baxter will be greatly missed, especially in Liverpool motor cycling circles, and his loss adds one more name to the growing list of well-known riders who have given their lives for their country.

### A MOTOR CYCLE WITH A HISTORY.

ON page 494 of our issue of May 25th we reproduced a photograph of an early pattern Douglas that had been picked up out of the sea at Suvla Bay. At the time its earlier history was unknown, but a reader, Cpl. E. E. Smith, has sent us some particulars which throw further light on it. Cpl. Smith first saw the Douglas in question at Leamington in February, 1915, and the second time at Suvla Bay the following September. He had a short chat with its owner, a sergeant of artillery, who told him that it went very well. On the third occasion Smith saw it abandoned by a riding track on the Gallipoli Peninsula. How it got into the sea is still a mystery.

Cpl. Smith, in the same letter, refers to some remarks made by Petty-Officer G. L. Rossiter in *The Motor Cycle* of April 27th, page 395. The latter stated that the motor cycles at Suvla Bay seemed capable of standing anything and the riders capable of taking them any-

where. Cpl. Smith says that it was his section to which this refers, and wishes on its behalf to acknowledge the compliment, and also to place on record his appreciation of the Triumphs which his Signal Company had at Gallipoli.

### SOME IMPRESSIONS AFTER SIXTEEN MONTHS' DESPATCH RIDING.

LETTERS from men on active service, especially from former motor cyclists now acting as military riders, are always interesting, as they are in a position to make comparisons between peace and war time riding. There is, therefore, no excuse to offer for reproducing the following extracts from a letter recently received from L.-Cpl. Clarke, a motor cyclist attached to the A.S.C. in France, and an old trade man who has had sixteen months' army experience:

"We carry on despite weather conditions and worse roads, but that longing for a ride on some of our good homeland highways! I am an old rider, as I started in 1907 as tester to a well-known firm, but never had an opportunity for much competition work. I ride a Triumph out here, and must add my appreciation to those of others, that it is wonderful how well it stands the racket, but sometimes I long for a machine

Sgt. George Bailey, R.E., who has just been awarded the Military Medal. Before the war Bailey was employed by Douglas Bros. in their experimental department.

such as I used to ride when working as mechanic for G. E. Stanley, the 'Wizard' of Singer's. The machines used here could do with a slightly higher gear; 5 to 1 is a trifle too low for a 4 h.p. solo, and there are rare occasions when one strikes a fairly decent road.

"I was exceedingly sorry to hear of Sir R. K. Arbuthnot's death. I had the privilege often of serving him and talking with him when he used to call at the Triumph London depot. If I remember aright, he was an ardent admirer of the 3½ h.p. single."

H. G. Wigzell, assistant secretary to the A.A. and M.U., has just obtained a commission in the A.S.C., M.T.



The late John Gibson, who has been accidentally killed. When the photograph was taken he was a lance-corporal in a Devon regiment; at the time of his death he held a commission in the same regiment.



Sgt. George Bailey, R.E., who has just been awarded the Military Medal. Before the war Bailey was employed by Douglas Bros. in their experimental department.





## TIME TO LIGHT LAMPS

"SUMMER" TIME.

June 29th	...	...	9.49 p.m.
July 1st	...	...	9.48 "
" 3rd	...	...	9.48 "
" 5th	...	...	9.47 "

### Premature Payments.

It is said that some motorists have already paid the proposed increased tax on motor cycles and cars, now withdrawn in favour of a further petrol duty of 6d. per gallon. All such should at once make written application to the particular Council concerned for the return of the amount overpaid.

### Pleasure Motoring.

A member of our staff visiting the West of England during last week-end noticed that regular daily pleasure trips, per motor char-à-banc, are still in full swing in that part of the country, and are apparently well patronised. In particular two of these were seen returning from a long day's run, and the passengers had been dining, not wisely but too well, as evidenced by their rowdy behaviour, singing, and shouting. And still the harmless motor cyclist, whether on business or needful recreation bent, has to beg for petrol, and his demands are received as though it were a criminal act to use the spirit at all.

## SPECIAL FEATURES

THE CULT OF THE SIDECARRIER: Experiences of Users, and Many Illustrations.  
THE ECONOMY OF THE MOTOR CYCLE.

### The M.M.G.S. Annual Sports.

On Friday afternoon last there were held at Bisley Camp, the Motor Machine Gun training centre, the annual sports of the Corps. It was hoped that some motor cycle events would have figured in the programme, but after due consideration by the committee this was unfortunately found to be impossible. Throughout the afternoon the weather was threatening, but, fortunately, not bad enough to interfere with the sports. During the afternoon the excellent band of the 12th Reserve Cavalry Regt. played, by permission of Lt.-Col. R. G. Brooke, D.S.O.

### Out of Evil cometh Good.

To an extent not generally appreciated, the British motor cyclist has in the past supported German industries in following his pastime, generally not a few of his accessories and nearly always his magneto hailing from the hideous Hun-land. And this is not the worst, since in practically every country of the globe it is the British motor cycle that is most esteemed and in greatest demand, the consequence being that our own manufacturers have been instrumental in creating a wide market for such German-made goods. There is this much to be hoped for in the future, however, that, if the recommendations of the Paris Conference are acted upon as they should be, we have seen the last of such an odious state of affairs. British magneto manufacturers, please note.

### More Petrol Waste.

During the past few months many instances have been quoted of wastage of petrol in the Services. We have just been told, though we can hardly credit it, that brick floors at a certain aerodrome are swilled with petrol, just as if it were water, and then swept with yard brooms!



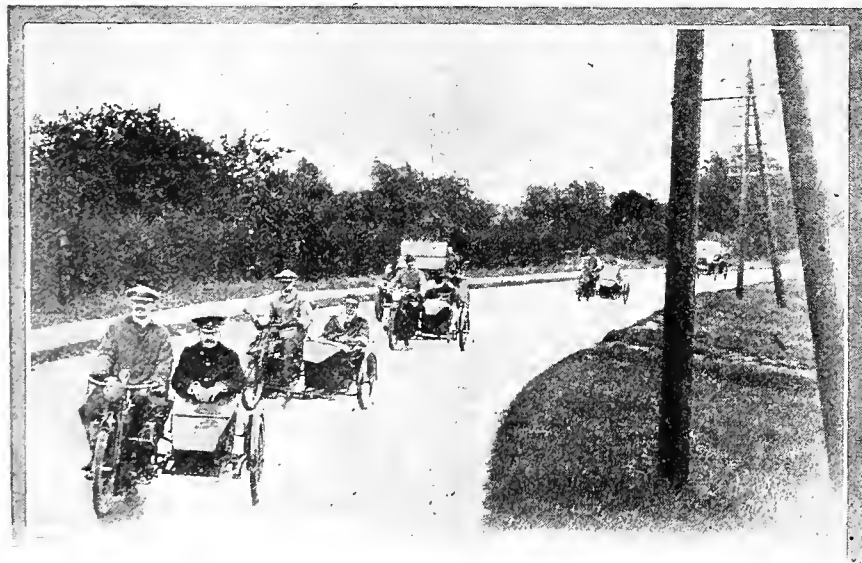
Pastor John Swordson, of Karis, Finland, who uses his L.M.C. motor cycle for travelling in remote parts of Finland on his preaching tours.

### The Petrol Tax.

Another jump in petrol can be expected at any moment as a result of the decision to impose a tax of 6d. per gallon on petrol consumed, in lieu of the heavy taxes originally proposed. The new scheme is referred to on another page, as also the part of *The Motor Cycle* in changing the unfair proposals originally made.

### Thornton Heath Wounded Soldiers' Outing.

The wounded soldiers' outing referred to on page 586 of the issue of the 22nd inst. will be held, all being well, on Wednesday afternoon, July 5th, starting from the Clock, close to Thornton Heath Station, at 2 p.m. The journey will be made to Leith Hill, where tea will be served. Offers of assistance have been received from several drivers of sidecars, and the organiser, Mr. Alfred Taylor, has promised to bring a certain number of friends. All owners of sidecars who intend to assist, and have not already informed Mr. Taylor, should write him, c/o the Editor, *The Motor Cycle*, 20, Tudor Street, E.C.



### POPULARITY OF SIDECAR RUNS FOR WOUNDED SOLDIERS.

Convalescent soldiers in sidecars on the road to Staines from Harrow on Saturday last.

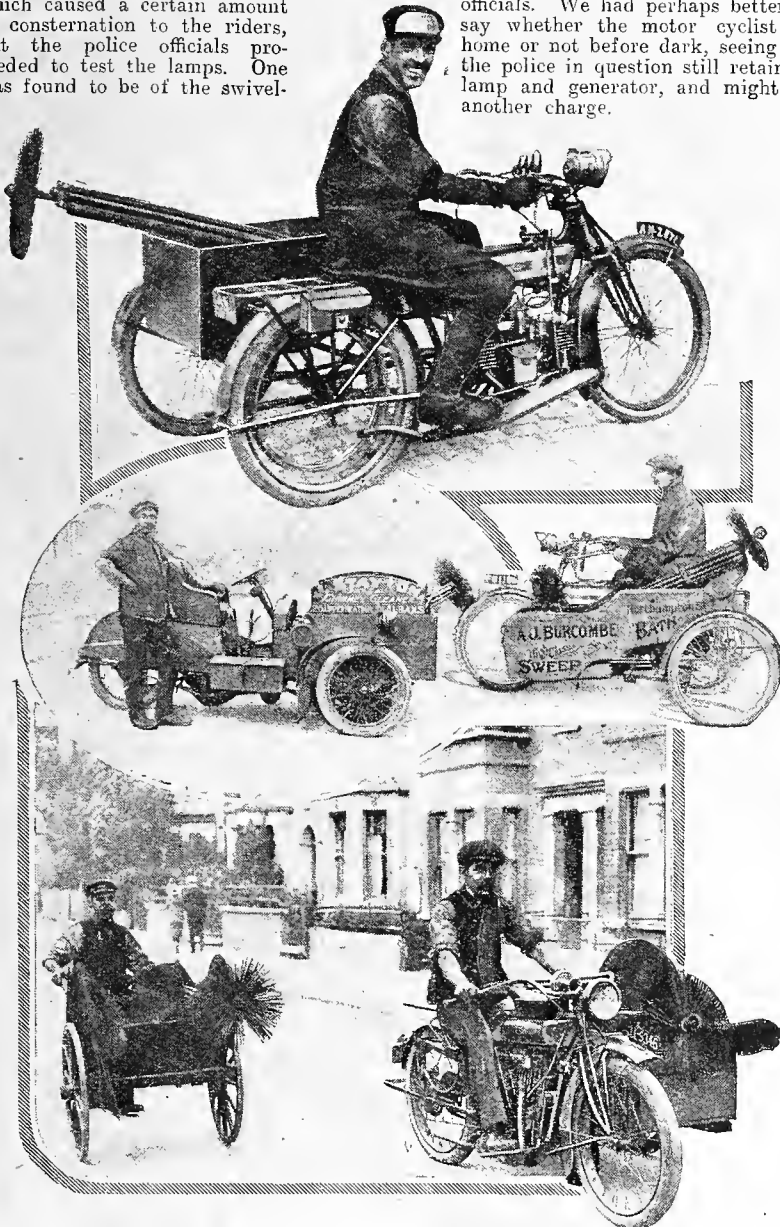
**Death of a Speedometer Manufacturer.**

The death is announced from New York of John K. Stewart, inventor of the Stewart speedometer and head of the manufacturing firm.

**Police and Swivelling Lamps.**

Two Coventry motor cyclists travelling between Bedford and Northampton last week-end were stopped by a constable in uniform, who was assisted by a special constable, ostensibly to examine the driving licences. After copying the details from these, the remark was passed, "Are your machines in order?" which caused a certain amount of consternation to the riders, but the police officials proceeded to test the lamps. One was found to be of the swivel-

ling variety, though the other rider had taken the precaution to braze the attachment, as we have recommended on so many occasions in the past. The lamp of the offending motor cyclist was confiscated, and as it was 8.20 p.m. and the motor cyclists were some forty miles from home, it proved rather awkward. No entreaties succeeded in obtaining the return of the lamp, as it was pointed out that this would mean repeating the offence. Apparently the fact that the motorist had forty miles to go with no lamp and was obliged to exceed the speed limit did not occur to the police officials. We had perhaps better not say whether the motor cyclist got home or not before dark, seeing that the police in question still retain the lamp and generator, and might add another charge.



THE MODERN CHIMNEY SWEEP FINDS THAT HE CAN ACCOMPLISH MUCH MORE WORK WITH A MOTOR CYCLE THAN WITH A HANDCART, AND THE INCREASED BUSINESS SOON MORE THAN REPAYS THE COST OF THE SIDECARRIER.

The left centre picture is of a ten-years-old Riley tricar converted for a sweep's use. It is still running well. The Bath sweep shown in the right centre takes off the special cover for the sidecar for pleasure runs at week ends.

**Price of Petrol.**

According to Pratt's circular issued on Saturday last, petrol remains at the same prices as it did before the new taxes were announced last week. But the question is, can one obtain petrol at the old figures?

**Outing for Wounded Sailors.**

It is proposed to hold another outing, this time for wounded sailors, on Saturday, July 8th. The trip will be to Lord Northcliffe's seat, Sutton Place, Guildford. Sidecarists who are willing to take part are requested to communicate with Mr. J. A. Masters, c/o Harley-Davidson Motor Co., Ltd., 74, Newman Street, W.

**The National War Funds.**

At the week-end the principal war funds stood as follow:

The Prince of Wales's National Relief Fund (£3,318,000 distributed)	£5,909,097	0	0
Fund for the Sick and Wounded	3,938,393	0	0
The Queen's Work for Women Fund	169,592	16	4

**Running Costs of Sidecarriers.**

In compiling this special number of *The Motor Cycle* we have been struck with the fact that few users of sidecarriers appear to keep careful and full account of the running expenses of the machines. This applies in particular to the small tradesman, who probably only has one or, at the utmost, two machines. But whether it is one or a dozen, the desirability of keeping a careful record of the working costs cannot be over-emphasised. It is the only way to see that the very best results are being obtained from the vehicles.

**A Strenuous Run in New Zealand.**

A remarkable sidecar run has recently been accomplished in New Zealand. E. F. C. Hinds drove a Powerplus Indian sidecar the whole length of the South Island, a distance of 648 miles, in 31½h. The average speed of 20½ m.p.h. on paper may seem very ordinary, but when the appalling roads and bad weather are taken into account one wonders how such a good speed was possible. At one place in the early hours of the morning Hinds and his passenger had to wait nearly two hours for petrol, and in several districts the roads were so bad that mile after mile had to be covered on bottom gear. The starting point was Picton, at the north of the South Island, and the finishing point The Bluff, at the southern end.

**Harrow Wounded Soldiers' Outing.**

Quite a successful sidecar outing for wounded soldiers was carried out by a few enthusiastic motor cyclists of Harrow last Sunday, June 25th. Permission to take part had been given by the Commandant of the Holmleigh Hospital, Mr. C. J. S. Thompson, to about twenty of the most convalescent of the invalids.

A start was made from the hospital at 2 p.m. sharp, and the route taken was through Pinner, Ruislip, Uxbridge, and Staines, a distance of twenty-three miles. At Ickenham the Rex combination had tyre trouble, but everyone reached the Bridge House Hotel by 3.30.

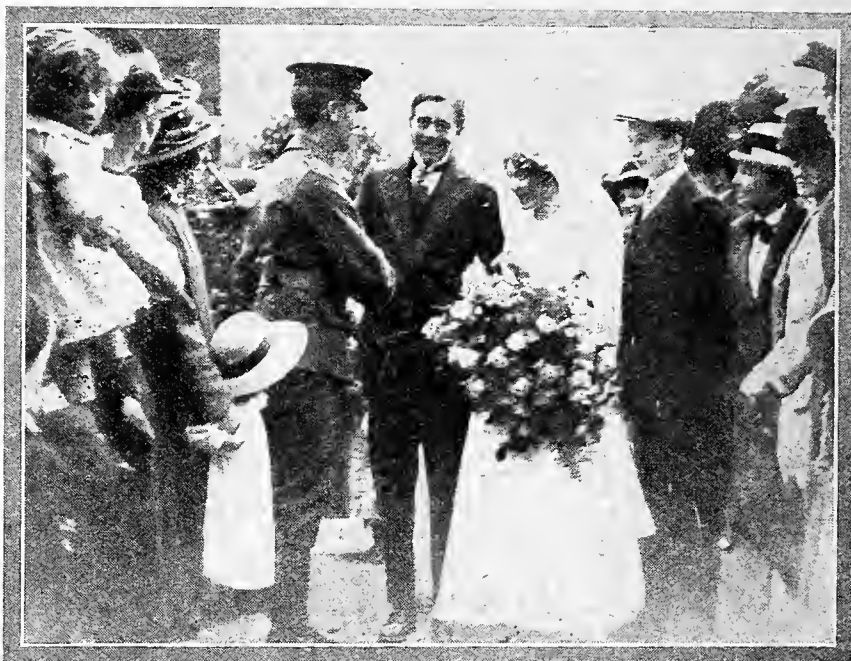
The guests were then taken for a river trip on a motor boat kindly lent by Mr. Sweeting. After a pleasant hour spent in this way, they returned to the hotel, where tea was provided for them by Messrs. Simpson and Long.

## Average Prices OF Second-hand Machines.

From "The Motor Cycle" of June 22nd.

WE give below the average prices of second-hand models offered for sale in *The Motor Cycle*. Where it is possible to obtain a sufficient number of each model the average for the past week is quoted, otherwise the last average is given, if within four weeks.

Make.	Year.	H.P.	Average for last week.	Latest average obtainable
A.J.S. ....	1915 6	3-sp. sidecar ..	£92	—
" .....	1914 6	3-sp. sidecar ..	—	£63
" .....	1913 6	3-sp. sidecar ..	—	£63
" .....	1915 2½	3-speed .....	—	£47
Allon .....	1915 2½	2-stroke .....	—	£29
Bradbury ..	1914 6	3-sp. sidecar ..	—	£48
" .....	1914 4	sidecar .....	—	£37
" .....	1913 4	2-sp. sidecar ..	—	£28
B.S.A. ....	1916 4½	3-speed .....	£61	—
" .....	1915 4½	3-sp. sidecar ..	—	£64
" .....	1915 4½	3-speed .....	£46	—
" .....	1914 4½	3-sp. sidecar ..	—	£49
Calthorpe ..	1915 2½	2-speed .....	£28	—
Chater-Lea ..	1915 2½	2-stroke .....	£29	—
Clyno .....	1914 6	3-sp. sidecar ..	—	£48
Douglas .....	1915 2½	3-speed .....	£41	—
" .....	1915 2½	2-speed .....	£46	—
" .....	1915 2½	T.T. ....	—	£45
" .....	1915 4	3-speed .....	—	£55
" .....	1914 2½	2-speed .....	£38	—
" .....	1914 2½	2-sp. T.T. ....	—	£37
" .....	1913 2½	2-speed .....	£32	—
Enfield ....	1916 6	2-sp. sidecar ..	£31	—
" .....	1915 6	2-sp. sidecar ..	£67	—
" .....	1914 6	2-sp. sidecar ..	£54	—
" .....	1915 3	2-speed .....	£40	—
" .....	1914 3	2-speed .....	—	£34
H. Davidson ..	1915 7-9	3-sp. sidecar ..	£74	—
" .....	1915 7-9	3-speed .....	£54	—
Hobart ....	1915 2½	2-stroke .....	—	£23
Humber ....	1912 3½	2-sp. sidecar ..	—	£30
" .....	1913 2½	2-speed .....	£18	—
Indian .....	1915 7	3-sp. sidecar ..	£75	—
" .....	1915 5	3-sp. sidecar ..	—	£62
" .....	1915 5	3-speed .....	£51	—
" .....	1916	Powerplus sidecar	—	£96
" .....	1914 7	2-sp. sidecar ..	£55	—
" .....	1914 T.T. ....	—	—	£36
James .....	1915 4½	3-sp. sidecar ..	—	£56
" .....	1915 2½	2-sp. 2-stroke ..	—	£25
" .....	1915 3½	3-speed .....	—	£46
Levis .....	1915	Popular .....	£23	—
" .....	1914	2-speed .....	—	£22
Matchless ..	1915 8	3-sp. sidecar ..	—	£78
" .....	1914	3-sp. sidecar ..	—	£77
" .....	1913 8	3-sp. sidecar ..	—	£59
New Hudson ..	1915 2½	2-speed .....	£30	—
" .....	1914 6	3-sp. sidecar ..	£48	—
New Imperial ..	1916 2½	2-speed .....	—	£34
" .....	1915 2½	2-speed .....	£27	—
New Ryder ..	1915	2-speed .....	£27	—
O.K. ....	1915	2-speed .....	£25	—
P. & M. ....	1914 3½	2-sp. sidecar ..	£52	—
" .....	1913 3½	2-sp. sidecar ..	—	£37
Premier ....	1914 2½	3-speed .....	£20	—
" .....	1912 3½	3-speed .....	£23	—
Radco .....	1914	2-speed 2-stroke ..	£16	—
Rex .....	1914 6	2-sp. sidecar ..	£38	—
" .....	1913 6	2-sp. sidecar ..	—	£32
Rover .....	1915 3½	T.T. ....	£43	—
" .....	1914 3½	3-sp. sidecar ..	£43	—
" .....	1914 3½	3-speed .....	£38	—
Rudge .....	1914 3½	multi .....	£37	—
" .....	1914 5-6	multi sidecar ..	—	£40
" .....	1913 3½	multi .....	£28	—
" .....	1913 3½	multi sidecar ..	£35	—
Scott .....	1914 3½	2-sp. sidecar ..	£48	—
" .....	1914 3½	2-sp. sidecar ..	£38	—
" .....	1913 3½	2-sp. sidecar ..	£36	—
Sunbeam ....	1914 6	3-sp. sidecar ..	£75	—
Triumph ....	1915 2½	2-sp. 2-stroke ..	£36	—
" .....	1914 4	3-speed .....	—	£38
" .....	1914 4	3-sp. sidecar ..	£47	—
" .....	1913 3½	3-speed .....	£33	—
" .....	1913 3½	3-sp. sidecar ..	—	£42
" .....	1913 3½	T.T. ....	£28	—
Williamson ..	1914 8	2-sp. sidecar ..	£58	—
Zenith .....	1913 8	Gradua sidecar ..	—	£36
" .....	1913 6	Gradua sidecar ..	£38	—
" .....	1913 6	Gradua .....	£33	—



### WELL-KNOWN RIDER MARRIED.

George Brough and his bride, Miss Evans of Bulwell, photographed after the ceremony at Nottingham on Monday last. The wedding was to have taken place last month, but had to be postponed owing to illness of the bridegroom.

## PETROL LICENCES.

### Penalty for Breach of New Regulations.

THE parliamentary correspondent of *The Times* writes: The new Government scheme for the control of petrol stocks is explained in a new clause to the Finance Bill which Mr. McKenna has just put down. All consumers, except doctors, veterinary surgeons, and users of commercial cars, will in future only be able to obtain petrol under a system of permits at a special duty of 6d. a gallon above the existing rates. The following conditions are attached:

1. A person shall not obtain or attempt to obtain a supply of motor spirit unless he is the holder of a licence for the time being in force under this section, or in excess of the amount with which he is authorised to be supplied by the licence.

2. A person shall not supply motor spirit to a person unless he is the holder of a licence for the time being in force under this section, or in excess of the amount authorised to be supplied by the licence.

3. A person supplying motor spirit shall, in such manner as may be directed by regulations made under this section, enter on the licence of the person supplied the name and address of the supplier, the amount supplied, and the date on which it was supplied.

4. A person shall not use motor spirit with which he is authorised to be supplied for any special purpose by his licence for any other purpose.

5. If any person acts in contravention of or fails to comply with any provision of this section or makes any entry on a licence which is false in any material particular, he shall be liable to an Excise penalty of £100.

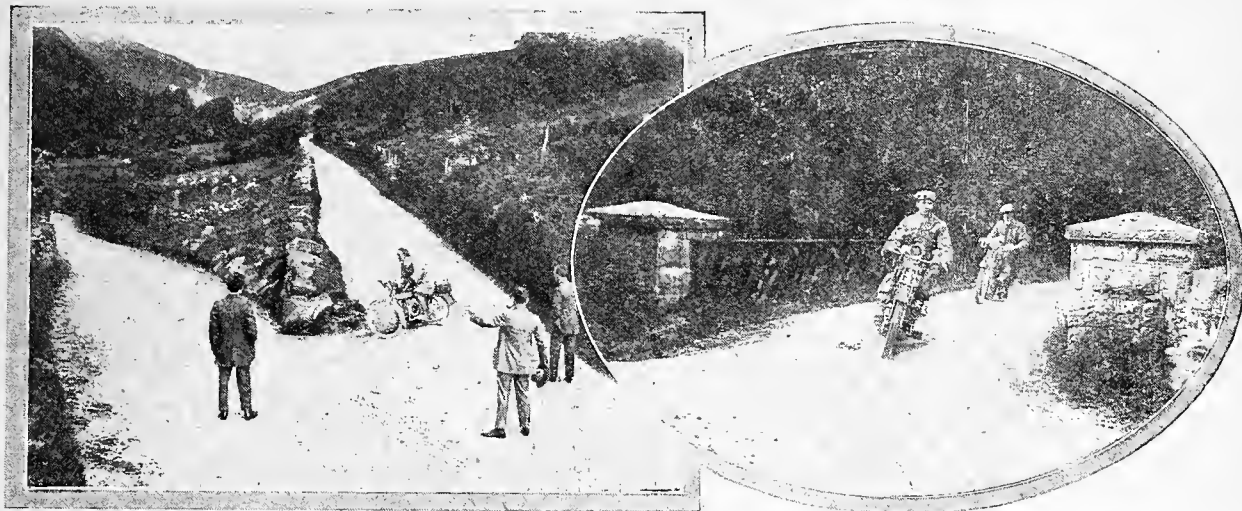
### MOTOR CYCLISTS AND LIGHT CARS.

Those readers of *The Motor Cycle* who have latterly turned to small cars, or who may own both types of vehicles, will be interested in *The Light Car*, published each Wednesday in a buff cover. *The Light Car* deals with small cars of all types, and is, in brief, the journal of economical motoring. An article in yesterday's issue (now on sale), which should particularly appeal to motor cyclists, is a lady's account of her experiences with a Grand Prix Morgan. Miss Nora Hough, the writer, who hails from Birmingham, is known to many readers as a leading motor cyclist, so that the suggestions made, including one of detachable wheels for the Morgan, are from practical road experience.

After you have read this issue of "The Motor Cycle," hand it to a tradesman acquaintance—he is sure to be interested.

## AN IRISH COMPETITION.

### ALL DAY RELIABILITY TRIAL IN COUNTY WICKLOW.



SCENES IN LAST WEEK'S IRISH TWENTY-FOUR HOURS' TRIAL.

(Left) D. Lucy (2½ h.p. Douglas) rounding the hairpin bend leading from Wicklow Gap to the Seven Churches. (Right) Two B.S.A. riders, F. L. Dooley and C. S. Kettle, crossing the Dargle Bridge at the foot of the ascent of the observed hill at Annacrevy.

THE all day reliability trial of the Dublin and District Motor Cycle Club, which started from Dublin on Friday evening, at eight o'clock, came to a conclusion at 7 p.m. on Saturday, when nineteen of the twenty-five starters checked in at the final control at Rathfarnham. Difficulties of securing petrol at one time looked like compelling the committee to abandon the event, as so many other competitions in Ireland have had to be abandoned during the year, and they ultimately resulted in the time honoured route to Donegal and back, with the ascent of Glengesh as the crucial part of the trial, being abandoned in favour of a course more adjacent to Dublin.

#### Petrol Supplies.

Even this alteration did not end the troubles of the promoters, as it was found necessary to make private arrangements for the supply of petrol, and for this purpose the services of a motor car were secured to carry the fuel from point to point. The arrangement worked out quite satisfactorily, and at no point had any of the competitors to retire owing to want of fuel.

The competition started from Rathfarnham, the men being sent away at one minute intervals.

The first part of the route took the riders through Glendhu and over the Sugarloaf mountain, this being part of the military road. Once over the Featherbed, the men descended to Glencree, and from there ascended to the source of the River Liffey and the highest point of the military road at Sally Gap. Then they went westward to the main Dublin-Blessington road, and completed the first section of the route by an easy run to Carlow.

It was somewhat of a misnomer to call the event a twenty-four hours trial, as, apart from the necessary stoppages for

food and refreshment, there was a stop of nearly five hours at Carlow, and also the event finished an hour earlier than it started. The five hours at Carlow gave an opportunity of getting a little sleep, of which, however, few availed themselves, and also robbed the competition of the terrors of night riding—always a dangerous game on Irish roads, which are often selected by donkeys as their sleeping places. Hurse's retirement was due to a broken inlet valve, and Morrogh's to overheating.

The morning journey commenced with a run towards Dublin as far as the outskirts of the city. The men then returned to Naas, where the lowlands were left behind, and the Co. Wicklow crossed in an easterly direction. The route lay through Ballymore-Eustace, Hollywood, across Wicklow Gap to Glendalough, where two hours were allowed for a second breakfast. Afterwards the trial was resumed by rejoining the military road at Laragh, and following it over the mountains to Drumgoff and the Vale of Glenmalur, and again over a mountain range to Aughavanagh. Here the riders turned eastwards down the valley of the Aughrim to Woodenbridge, and passing through the Vale

of Avoca, with a tantalising glimpse of the Meeting of the Waters, they proceeded towards Rathdrum. The early morning journey from Carlow saw four men retire—Allen (Sun), with a broken oiler; Mayne (Indian), with a broken chain; Sullivan (Indian), with timing and carburettor troubles, following a fall; and Fitzpatrick (Indian), with tyre troubles.

#### Steep Non-stop Sections.

The final stage of the trial was by no means the least severe. It involved the ascent of the Wicklow mountains to Sally Gap.

The route then ran towards Dublin, returning southwards to take in the two observed hills—Goat Pass, near Enniskerry, and Annacrevy Hill, from the Dargle.

After the second observed hill the men returned to near Roundwood, and made a second ascent of Sally Gap by Luggelaw, returning to Dublin by the military road.

#### List of the Survivors.

The first of the men was due at Rathfarnham at seven o'clock, and punctually to time Freeman, the cup-holder, turned up on his Indian. The nineteen who survived the night and early morning journeys finished to time. They were:

- W. H. Freeman (7 Indian)
- A. W. Mooney (7 American Excelsior sc.)
- J. Stewart, Belfast (2½ Douglas)
- Corpl. J. Griffiths (2½ Douglas)
- P. Grimes (7 Indian sc.)
- D. Lucy, Cork (2½ Douglas)
- W. J. Henderson (7-9 Harley-Davidson sc.)
- F. McDonagh (4½ B.S.A.)
- F. Cunningham (7 Indian sc.)
- F. L. Dooley, Cork (4½ B.S.A.)
- A. Carlon (7 Indian sc.)
- C. S. Kettle (4½ B.S.A.)
- S. A. Allen (5 Enfield)
- T. Woods (4½ B.S.A.)
- O. S. Redmond (3½ Indian)
- T. J. Dunphy (5 Enfield)
- C. B. Franklin (2½ Indian 2-stroke)
- T. Toole (4½ B.S.A.)
- R. Walsh (4½ B.S.A.)

#### IMPORTANT NOTICE.

#### GOODS MADE IN GERMANY.

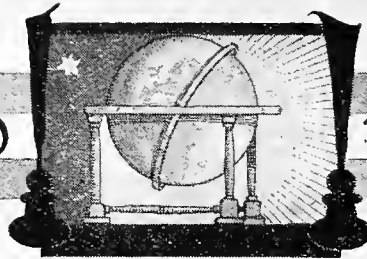
The proprietors of this journal, being fully in accord with the recommendations agreed upon at the Paris Economic Conference, give notice that they will not permit the advertisements of new goods manufactured in enemy countries to appear in this publication, either during or after the war.

ILIFFE & SONS LTD.



## LETTERS TO

## THE EDITOR



The Editor does not hold himself responsible for the opinions of his correspondents.

All letters should be addressed to the Editor, "The Motor Cycle," Hertford Street, Coventry, and must be accompanied by the writer's name and address.

#### Fast Stretches.

Sir,—I notice that your contributor "Ixion" refers to "fast stretches." Personally, I have not been "on the road" for nearly two years, and have forgotten most of the fast bits. But a portion of the Andover-Salisbury road is not so slow, but is undulating. Then there is the road from Devizes to, I believe, Beckhampton, on the Bath Road. Cambridge to Newmarket is as fast a road as I can remember, there being only two corners that one cannot get round at 60 m.p.h. on a car. Does "Ixion" know the Northampton-Oxford Road—a really sporting forty miles blind? B.A.T.

#### Bearing Pressures in Long-stroke Engines.

Sir,—I heard a gentleman the other day jocularly remark, "Whatcher wantin' 'it me like that for? I ain't done you no 'arm," and when an hour afterwards I read "Ixion's" remarks re long-stroke engines and novices it at once occurred to me that the long-stroke engine, could it speak, might aptly make the same remark. I imagine careless handling of the long or short-stroke engine is bad for the bushes of either type, but it must be remembered, when making comparisons, that the maximum pressure on the connecting rod bearings of the short-stroke engine of given capacity is much greater than that on the long-stroke bearings; also that friction primarily depends upon pressure and wear upon friction. This being so, and, other things being equal, short-stroke engine bushes must necessarily have the shorter life.

JAS. L. NORTON.

#### A Farmer's Experience of a Sidecar Outfit.

Sir,—In April, 1914, I purchased a Sun with 4½ h.p. single-cylinder Precision engine, Sturmer-Archer three-speed hub gear, Dunlop tyres and belt. To this I attached a second-hand wicker sidecar, and the outfit has done the work of a pony and trap, such as fetching goods from the station (two and a half miles), and conveying dairy produce, etc., to market. Recently I took a carcase of pork (120 lb.) to the

pork butcher in a town four miles away, over a hilly road, and I have frequently taken loads of from 2 cwt. to 3 cwt. beside myself (150 lb.) The mileage is just over 5,000. I have always completed my journeys to time. The engine valves have never been ground in, and compression is still satisfactory. I have decarbonised once—sixteen months ago. The hub gear has given perfect service, and I might say, for the benefit of users of hub gears, that I always slightly declutch, as well as give the exhaust litter a pull when changing gear.

At present I am using a .50 jet in the Amac carburetter, and the consumption of petrol is somewhere in the vicinity of 70 m.p.g. The engine takes our stiff Cornish hills with full load without a murmur, including the Gunnislake terror. I feel sure that if an ordinary farmer like myself can make the sidecar a profitable investment, its possibilities for the use of butchers, grocers, etc., must be unlimited. I use my outfit but very little for pleasure, as I have to work seven days per week in these critical times; but a business drive on a thoroughly reliable machine is a real treat and a pleasure in itself.

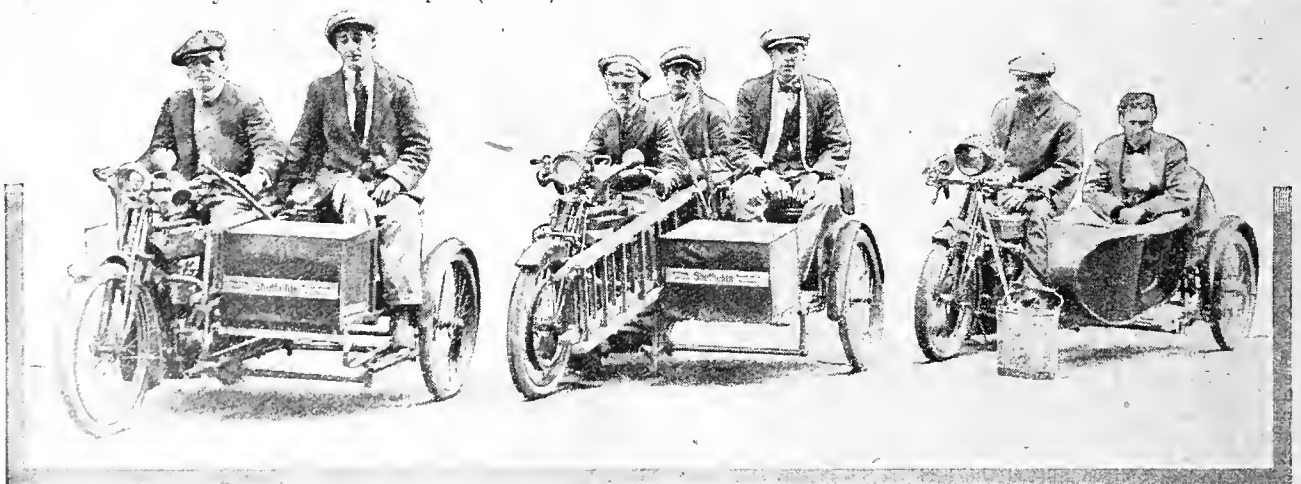
SATISFIED.

#### British Export Trade in Motor Cycles.

Sir,—I take this opportunity of assuring you that your efforts to obtain greater facilities for exporting motor cycles are much appreciated by our friends abroad. A Danish friend of mine, writing from Copenhagen, says, "I certainly intend to follow your advice and invest in a motor cycle, but I fear it will be some considerable time before I can get a suitable mount. I would never dream of getting anything but a British-made motor cycle, but the importers inform me that they cannot hope to fulfil present orders until far into the autumn. Money is plentiful in this country, and the American agents are reaping a rich harvest."

It seems a great pity that our makers should not be permitted to benefit by this unique opportunity of increasing their markets, but it is to be hoped that your efforts may meet with success.

JULIUS SALVESEN.



SIDECARRIERS IN A BILL-POSTING BUSINESS.

3½ h.p. Ixion, 4½ h.p. B.S.A., and 5 h.p. Rex, used by Sheffield's, Ltd., advertising contractors, of Birmingham, in their bill-posting business. Motor vans were used formerly, but the sidecarriers have proved more successful, and it is probable that the firm's branches in other towns will follow suit.

### The Petrol Tax.

Sir,—I take it that the change in the motor tax will apply in the same respect to motor cycles, and I consider that we all are greatly indebted to you for the great efforts you have made all along the line to try and bring this about. Although we felt sure that the new tax if put into force would have soon defeated its own ends, still it is something in times like these to see the Government advised in time.

The week-end and small consumer now get a chance for a health run, and should be content with doing a shorter distance and a longer look at the country.

E. HAWTHORN.

Sir,—The other day the Chancellor of the Exchequer stated that the duty on petrol is to be raised to 1s. per gallon. What is the trade going to do? Are the manufacturers going to raise no protest? It is no use arguing about war prices and war costs. When the war is over, and the manufacturers have to pick up their trade again, the users of motor cars and bicycles will have found some line different from "expensive motoring" to fill up their time. It will be a melancholy experience walking through a large motor works after the war when no shells are on the lathes and the busy wheels are still.

Why this unreasonable crusade against motorists? What have we done?

THOS. ABLE.

### Distribution of Weight in Sidecars.

Sir,—I read with interest in your issue of June 22nd a letter from Mr. H. St. V. Addenbrooke, in which he denounces in unmeasured terms the distribution on the chassis of the weight of the sidecar body as delivered by the manufacturer. He asserts that the body should be so suspended that the centre of weight when loaded should be directly over the back axle, which naturally puts all the pressure on the two back wheels, and none on the front wheel and forks.

I admit the same idea occurred to me as a sidecar novice, and I altered the body accordingly, but immediately found, among other things, that the outfit was so subject to front wheel slip or skidding as to make it absolutely dangerous when cornering at speed. Since then I have made careful

practical experiments, alike as to the position of sidecar, stability of outfit under all conditions, and the difference which such position had on the power absorbed.

After these experiments, now some four years ago, I adjusted the outfit as follows: Line of sidecar axle, 4in. in front of back axle of machine; front of seat, 14in. in front of sidecar axle; centre of hub of sidecar wheel, 38in. from centre of hub of driving wheel. It has not since been altered, and gives perfect running. I have never had a trace of skidding; the outfit will run any reasonable distance hands off, as will also the machine solo, so that the effect of the side strain of which Mr. Addenbrooke speaks could have had very little effect on the trueness of the machine.

On the other hand, even with the weight distributed over the three wheels in this way I have broken the back bottom stay on which the sidecar chassis is fixed. With regard to the other point as to back wheel slip when hill-climbing and the practice of leaning or sitting on the carrier, this is not done altogether to prevent spin or slip, as Mr. Addenbrooke infers. Supposing there is absolutely no slip, a  $3\frac{1}{2}$  h.p. outfit will climb much better with the weight on the carrier instead of in the sidecar, especially when the hill has a slight bend to the right. This, I take it, is due, not to the transference of the whole of the weight, as he says, on the back axle, but to the centre of the driving wheel, which obviates a certain drag by the sidecar wheel when turning to the right or when meeting any obstacle or hole in the road.

For this reason I found that the nearer the sidecar was to the machine the better it climbed; this, of course, is again governed by the stability necessary.

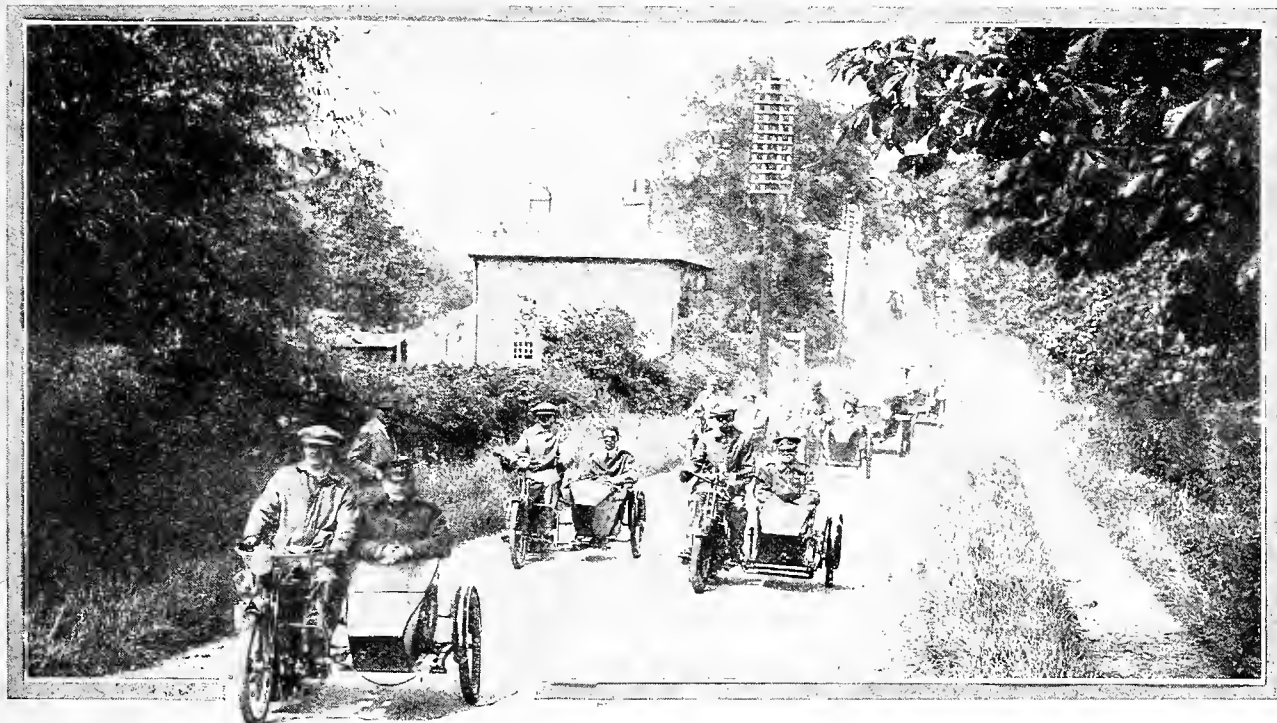
A. J. SHEPPARD.

### Naphtha as a Fuel.

Sir,—In last week's issue of your journal is a letter from H. W. Kilbey referring to some experiments he has been conducting with naphtha as a substitute for petrol.

The point of unsuitability which he raises, viz., that the acid which is produced on combustion reacts on the cylinder, has been answered by the inventors of "Natalite." This is an alcoholic fuel which, the inventors state, has no deteriorating action on the cylinder.

MOTOR CYCLIST.



CONVALESCENT SOLDIERS ENJOYING THE DELIGHTS OF THE OPEN ROAD IN SUMMER TIME.

The photograph was taken on the occasion of the sidecar outing on Saturday last organised for the wounded at Harrow, the destination being the Bridge-House, Staines.

#### Four-cylinder Engines.

Sir.—Mr. Freeman Lee's somewhat sarcastic reference to "a complete treatise on tuning" a four-cylinder F.N. in relation to my remarks on the subject probably arises from ignorance of the fact that recent letters of mine in this connection have brought me a host of postal enquiries from F.N. riders not possessed of his mechanical ingenuity; and, since the object of *The Motor Cycle* is to be of interest to the majority and not the minority of motor cyclists, I endeavoured in my letter to reply in as limited a space as possible to the mass of correspondents who are apparently essentially concerned with getting the best out of the standard machine without attempting radical alterations.

To avoid a detailed description of alterations, which could only be of interest to a few, I may say that if Mr. Lee cares to communicate with me through the Editor, I am prepared to lend him the patterns of a device similar to his own for the mechanical operation of the F.N. inlet valves, the difference being that my arrangement will work fairly satisfactorily, whereas his arrangement, as illustrated in *The Motor Cycle*, is practically identical with Mr. Stewart's original design, which he discarded as impracticable some years ago.

A little well-meant criticism of Mr. Lee's design may prevent enthusiasts wasting time and money for a speculative benefit. The sketch seems to show a manifold all in one piece through which is run a shaft with the cams superimposed. This is scarcely practicable, and would be a troublesome job. His cams should be recessed in the shaft, so that the latter will pull straight through the bearings.

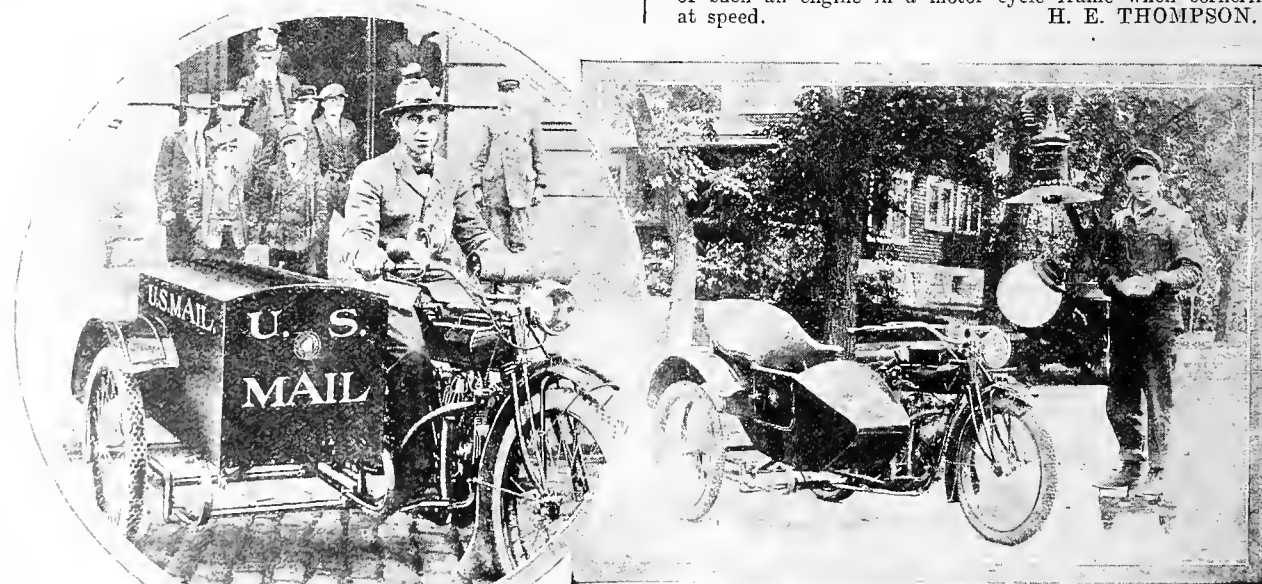
Again, cams operating directly on the valve stems, as per sketch, would rock the valves on the seatings, causing chattering, and, at high speeds, fracture of the valve stem. Spring slippers or rockers should be interposed, and here I would emphasise that the spring slipper used in my design not only causes the valve to open evenly, but also acts as a mechanical "closer," so that chattering, which is the bugbear of the F.N., cannot occur. No provision for lubricating the cams is shown, and when Mr. Lee remembers that they are subject to a continuous current of oil-removing petrol vapour, he will see that this item is a problem in itself. Since the shaft H must be rigid, and the cams are not adjustable, and since the manifold must make a gastight joint with the cylinders, it is essential that the method of manifold attachment must admit of adjustment. In practice, this is usually provided at the two middle joints. Mr. Lee appears to have overlooked this point. Shaft H made as shown in the sketch would cause misfiring in cylinders 1 and

4, owing to dilution of mixture. I found that this shaft required to run in long bearings, to be capped at the driven end, and to be provided with a stuffing gland at the other end. In fact, a special rectangular manifold with a side induction pipe is essential to satisfactory running. The chain drive to shaft H will never be entirely satisfactory. A skew gear is the proper thing, and in support of this statement I would direct attention to chain-driven cam gears in car practice, where silent chains with short centres and provision for adjustment are invariably employed. I do not think I need elaborate my criticism, as I assume Mr. Lee's sketch to be a rough diagrammatic exposition of an idea that is full of interesting suggestion, and it would ill become me to deter other amateurs from making public ingenious ideas by criticising in detail a rough drawing, the root principle of which might easily be worked up successfully by an enterprising manufacturer.

The letter on the same subject by "L.M." is altogether commendable. His double lever carburetter control is, however, not original, and has been extensively used in the North for some years, the idea having originated, I think, with Mr. Leigh Scanes, of the British Westinghouse Co. Moreover, "L.M.'s" censure of the F.N. Co. is not justified, as they have fitted their car carburetter with his idea for some years, the method of operation being by means of an outside lever to which can be attached a Bowden wire. It is a peculiar fact that, although the carburetter is so fitted, the makers do not utilise the fitment, preferring to join both controls to a single rod, thus leaving it to the expert owner to employ separate controls if so inclined. Presumably they, in "Ixion's" words, shared Carlyle's views as to the proportion of fools in the population. "L.M." should also remember that the F.N. automatic carburetter is expressly designed for the F.N. standard automatic valves. At low speeds these valves will scarcely open, and an ultra rich mixture is required to ensure a fair amount of gas entering the cylinders. Mechanical valves alter the conditions, and "L.M." will find that on the 7-9 h.p. F.N. with mechanical valves quite a different type of carburetter is fitted. Automaticity and complete efficiency in carburation do not go hand in hand, and the F.N. Co. have, I think, wisely preferred the simple and sufficiently efficient alternative.

One frequently reads in the motoring papers of hankerings after the rotary aero engine in the motor cycle frame, and "L.M." renews the appeal. Might I suggest that a little contemplative study of the antics of a child's top spinning is helpful in forming an estimate of the gyroscopic action of such an engine in a motor cycle frame when cornering at speed.

H. E. THOMPSON.



EXAMPLES OF THE BUSINESS USE OF THE SIDECAR IN THE UNITED STATES.

The mail carrier is an Indian outfit in use at Norfolk, Va., the U.S.A. postal authorities using many of these machines for parcel and rural deliveries. The other photograph shows an ordinary sidecar outfit of the same make used by an electric lamp mechanic of Hutchinson, Kan.

## Where the Motor Cycle Wins — Fighting Time.



### THE GREAT ADVANTAGE OF THE TWO-WHEELER FOR A PRESSMAN.

In this search for quick transit the motor cycle has been tried, and as the following article shows, with great success. An important point is that not only has the motor cycle proved to be the quickest means of "delivering the goods," but also the cheapest.

In order to show the working of the motor cycle under various conditions of press work, we present herewith short articles from three men each working in different towns and in different classes of work. These are:

(1.) A free lance London journalist who uses his machine for both the collection of news and photographs.

(2.) A photographer attached to a firm publishing morning, evening, and weekly newspapers in Liverpool.

(3.) A press and commercial photographer operating from Birmingham.

**T**HE very essence of a daily pressman's life consists of a continual race against time. Competition is so keen that every device that can be thought of is employed in the collection of news and photographs in order to beat "the other fellow," and if "the game is worth the candle" no expense is spared in getting the desired copy and negatives to headquarters.

As a result of growing competition, pressmen—both those on the staffs of various papers and free lance men—have tried every conceivable means of transport in an endeavour to go one better than competitors.

### I. IN THE WORK OF A LONDON FREE LANCE JOURNALIST.

**I**T does not follow that because a man is getting pleasure out of motor cycling that he must needs be "motoring for pleasure," but the delight of it, the joy of the open road, may come as a corollary to utilitarian work such as that of a commercial traveller. Mine is a case in point. I am one of those journalists who earn a precarious existence by what is known as "free lancing." That is to say, I owe allegiance to no particular journal, nor are my pockets well lined regularly every Friday or every month, as the case may be.

#### Competition with Staff Men.

Now the free lance has to compete with staff men, and in order to do this successfully he must be just a little better in one way or another; otherwise his "copy" would come second to that of the salaried man, and obviously papers are not out to pay their own men a weekly stipend and use an outsider's report or pictures. All other things being equal, everything depends on speed, and this is more the case with pictures, where agencies vie with each other in getting their photographs into the art editor's before any of the opposition. That is where the motor cycle comes

in. It enables its lucky rider to go one better than his colleagues who have to rely on public service vehicles. I think I can claim to have initiated the idea of running a machine all the year round as a means of transit in connection with the lay press, and I might here say that the enterprise has been well required.

#### Some of the Advantages.

Psychology plays a very important part in the success of the motor cycle as a journalist's hack, for a man will sometimes cover a doubtful "story" by road where he would not by train, because he knows that at the worst he will have had an enjoyable outing without profit, and when he comes back he is too delighted with the ride to trouble about the failure of the specific reason for it. But the man who unsuccessfully stalks a story by train has time to brood

over his bad luck. It has happened that I have been at the office without my machine, and because of this have not troubled to go on a speculative trip, because the chance of getting something was not worth the expense and inconvenience attaching to the job. It has also occurred that, because I had my machine I



L. H. Cade, a London journalist, who uses a 1915 Triumph in his work.



**Where the Motor Cycle Wins—Fighting Time.—**

have been on stories with only a small chance of getting anything with a market value, and it has turned up trumps.

The motor cycle, then, is a direct incentive to speculative business, which, taken all round, is the most profitable. It is also an extremely healthy means of transit, and is cheaper than any other practicable way of touring for business. The motor cycle enables a man to get back to town so much quicker, too, that he can get his matter or pictures out almost leisurely and yet be sure of getting into the editor's sanctum first. I remember once beating about a dozen photographers by nearly two hours on a story which happened in an obscure Kentish village, and the result was that I, at the least expense, secured all the proceeds.

There was another time when an incident which lent itself to interesting photographs gained currency in the press. It concerned a Marquis who was serving as a special constable in a Berkshire village, and, since the day was pleasant, I got across my Triumph with camera case slung over my back. Well, I found the

Marquis, secured some interesting snapshots, and did very good business out of it. But if I had not had a motor cycle I should never have gone on the job.

For about three years I have ridden up to London from my Croydon residence practically every morning, and have used the two machines which have served me—both Triumphs—on all roads and under all conditions. Never once have I been delayed; never have I been beaten by a train travelling colleague. Small wonder, then, that I regard my dear old bicycle as an essential "tool of trade."

And now there is threatened a total prohibition or serious curtailment of pleasure riding, and I fear me that the authorities will not lend a sympathetic ear to such cases as mine. Truly I do not use a commercial sidecarrier, but nobody ever used a machine more genuinely for business purposes than I do. It pays me handsomely, despite the present price of petrol and the increased cost of upkeep generally, and it pays the nation because I contribute much more to the Exchequer by using the machine than I should if I refrained from doing so.

L. H. CADE.

## II. TELLING CASES OF THE ADVANTAGES OF THE MOTOR CYCLE FOR A STAFF PHOTOGRAPHER.

**T**AKE the sudden emergency case. One morning there was a sudden murmur round the office, "Big railway smash." I rush into the editor's office and there learn that it is in a corner of Yorkshire difficult to get at by railway, and ninety miles away. I sling my camera case on back, run across to the garage, fill up with spirit, and away. How that Zenith did go. The run to Lancaster (52 miles from Liverpool) was well in front of best train time, and the scene of the smash was reached over three hours before our reporters, who did their best by train and bicycle. Now these three hours were more important to me than to the reporters. I got snaps while the wreckage was being rapidly removed. Three hours later so much had been cleared that the photographs taken then had nothing like so good a news value as those I secured earlier. A quiet return home, and next morning the *Daily Post* was the only Liverpool morning paper to publish illustrations of the disaster.

### Beating Trains, Trams, and Taxis.

Now take a case where the time and place are all known beforehand, as the funeral of young Squire Gladstone at Hawarden. This was timed for 3 p.m. In the morning I rode over, after leaving instructions at the office to have all ready for a last minute rush. At Hawarden I found a dozen pressmen, all talking over the quickest route back. My chief competitor had fixed on a fast car to Chester, then express to Rock Ferry, and then electric underground railway to Liverpool, a fast route. This would take a lot of beating, but would be a very close thing for catching the last edition.

I placed my motor cycle just clear of where the crowd would stand, on the road to Queensferry. The funeral appeared, and at 3.15 p.m. we all got the snaps we had waited for, and then went our different

ways. I jumped on the machine and let it go down the hill; as everybody was at the funeral the road was quite clear, and travelling at over a mile a minute I swooped down to the ferry. I had warned the toll-keeper when crossing in the morning, and he had the bridge gate held open. The Zenith took that bridge in a few bounds, and the sixteen miles to Birkenhead landing stage were covered in very good time. Crossing the Mersey on the ferry boat, I was soon mounted again and reached the offices. I went up to the dark room three steps at a time. The plate was developed, fixed, and an enlarged print given to the Editor of the *Echo* at exactly 4 p.m., just forty-five minutes after taking

the snap; it appeared in the last edition. My friend the enemy failed by ten minutes, in spite of a fast run to Chester and just catching the express, etc. Result, we were the only paper to publish that photograph on the day it was taken. So the motor bicycle enabled us to come out with the illustration a full day before any other firm, even when, as in this case, expense was not spared, and the motor cycle proved the cheapest of all.

Now for an example of the usefulness of a sidecar outfit. One year the rivalry between the *Daily Mirror* and the *Daily Sketch* was very keen, and at the Waterloo Cup both papers sent their best men. On the last day the photograph to obtain is that, taken after the finish, of the winning dog with the blue ribbon round its neck, and held by the owner. This is



A good combination of man and machine that has made some splendid press photography "scoops"—J. Edge and his Zenith.

**Where the Motor Cycle Wins—Fighting Time.—**

usually obtainable just after 1 p.m. The only train to London from Liverpool to reach the capital in time for the following morning papers leaves Lime Street Station at 2 p.m., and the distance by road from Altcar to Liverpool is over eleven miles, the first part on narrow country lanes, and then miles of traffic and tram lines into town.

The weather was wild that February. The *Mirror* men had arranged to motor to Formby (four miles away), catch the electric train from Southport to Liverpool Exchange, and taxi from Exchange Station to Lime Street. The *Sketch* man (a chum of mine) depended on a car to run the eleven miles direct. As time went on we looked like being later than usual. The *Sketch* man asked me if I could beat the car in the run to town. I was sure I could. So he exchanged with my passenger, who was not in any hurry, and, after we had obtained our snap, we made a dash for it. It was a thrilling ride, passing the cars and taxis that had started before us on the narrow roads, where another car could not have passed at all; then the traffic dodging in town. We caught the London train by three minutes, and saw it off with the plates on board; then gleefully watched the arrival of the other boys, from five to fifteen minutes late. The *Sketch* was the only London paper to have the much sought after photograph the following morning.

**III. A MIDLAND PRESS AND COMMERCIAL PHOTOGRAPHER.**

**M**ANY people think that press photography is the only kind that requires a rush, not realising that the secret of private work is to let the persons concerned see the finished picture the same day, if possible. While the happening is fresh in their memory they are keen, and will promptly order photographs; let the matter wait, if only for a day or two, and the novelty has died out.

Some time ago I attended a field day of the Midland Motor Cyclists' Volunteer Corps, and left them about midday at Warwick. Knowing that they would assemble at 6.30 at the Stonebridge Hotel, I slipped back to Birmingham, developed my plates, posted a set of prints to *The Motor Cycle*, and took another set to Stonebridge to await the arrival of the men. The result was great astonishment and a good number of orders.

I recently attended a wedding on the outskirts of Birmingham, and learned that the bride and bridegroom were leaving on the 2.45 p.m. for Euston, the same train by which I proposed sending my photographs to the London papers. The work was done, and the bride and bridegroom were presented with a photograph of the wedding group before the train left the station. Had I depended on a tram, I should have had to send undeveloped plates to a London paper, and should not have received the order I did from the bride and bridegroom. In addition, I should

One Bank Holiday it was suggested that pictures taken at the seaside would be suitable for the day following the holiday. As we have many readers in Wales, I rode over in the morning to Bangor, and in the afternoon returned, stopping at the popular places on the coast and taking various pictures of a holiday nature. The following morning the *Daily Post* reproduced snaps taken at Bangor, Llanfairfechan, Penmaenmawr, Conway, Llandudno, Colwyn Bay, Rhyl, Prestatyn, etc. Of course this could have been done by a car, but consider the cost. This item of cost is all in favour of the motor cycle.

**An Appreciation of a Reliable Mount.**

This is my second Zenith. The first, a 6 h.p., served me well for two and a half years. Then I exchanged it for one of the latest 8 h.p. machines, which I received last June, and since then I have run, mostly with sidecar attached, 2,700 miles. The original belt is still on, and looks like new. The back cover I took off at 1,850 miles, and had it re-rubbered by Bates at a cost of about 12s. The original plugs are still in the engine, so beyond oil and petrol (the latter=70 m.p.g.) I have had no other expense. In the last fourteen years I have had at least that number of machines, but the present is proving the most satisfactory of the bunch.

MERCURIAL.

only have been able to send plates to one paper instead of prints to several.

**A Blow for the Londoners.**

A very big naval wedding, twenty miles from Birmingham, was attended by a number of pressmen from London. The village was on a branch line and the church some distance from the station. The London men had taxis to the station, a local train to the main line, and then a wait for the London train. By coming back to Birmingham at full speed I was able to send finished prints on the two-hour express, arriving in London within a quarter of an hour of the London photographers with undeveloped plates.

Having been previously connected with the motor trade, I have driven every powered car from a 6 h.p. single to a 60 h.p. six-cylinder, and every powered motor cycle from 1½ h.p. to 7.9 h.p., and I can safely say that I would not exchange my present outfit for any motor car, as I find it ideal for my require-

ments. The sidecar enables me to ride in traffic, grease, or dust, carry my cameras, clothing for the varying types of English weather, a big waterproof apron (which covers the whole outfit if I leave it in the rain), and, lastly, a good cart whip for dogs. I live in the country, one and a half miles from the station, and there are no trains on Sundays. This I could not do if it were not for the motor cycle. T. BLYTH CLAYTON.



T. Blyth Clayton, a Birmingham press photographer, who has had a 1915 3½ h.p. T.T. Sunbeam sidecar in continuous use for twelve months. He averages about forty miles per day seven days per week.

## WHAT IT COSTS.

Complete Running Expenses  
of Two Sidecarriers run by  
a Leeds Meat Purveyor.



Two of the three B.S.A. sidecarriers employed in a large butcher's business in Leeds. Two are kept in regular service and one in reserve.

SINCE 1912 Messrs. Isaac Stephenson, of Leeds, who are among the largest meat purveyors in the North of England, have employed motor cycles and sidecarriers for distribution purposes within Leeds city and environs, and during a chat with our representative, Mr. Stephenson, jun., expressed with much enthusiasm his views as to the usefulness and extraordinary economy of these machines.

It is quite usual, Mr. Stephenson explained, for customers to telephone for supplies as late as 10.30 in the morning, the goods to be delivered in time for preparation for the midday meal. By the old system of distribution complaints were regularly received and custom lost by delays in delivery, and Mr. Stephenson, jun., being a keen motor cyclist, finally advocated the use of sidecarriers.

### The Choice of Machines.

In 1912 two B.S.A. motor cycles, with extra strong sidecarrier chassis, were purchased, these being of the hub gear pattern, and though they gave long and excellent service (one, indeed, still being in use), Mr. Stephenson expresses a preference for the countershaft models, which, of course, is only to be expected. He speaks in high praise of the B.S.A. machines. The chain-cum-belt drive is found to be more suitable for this class of work than the all-chain drive, the elasticity of the friction system effecting a great saving where constant stopping and starting are to be done.

Two machines are employed on regular service, the third (hub gear model) being kept in reserve. Each of these machines does the work previously done by two delivery carts, and is infinitely more valuable than the latter as regards quickness in operation.

We append figures showing the total cost of maintaining two machines on the road and a third in reserve, and Mr. Stephenson states that one horse and cart costs approximately the same as one sidecarrier outfit—this being in normal times. Since the two machines accomplish the work of four delivery carts, however, a saving of 50% is effected in maintenance, and, what is of even greater importance, the services of two men are dispensed with, and wages, therefore, reduced to the same extent.

### Running Costs.

Each machine covers approximately 300 miles per week, and the figures below show all expenditures on the two outfits over a period of six months ended March 31st, 1916:

Petrol	...	...	...	...	£26 12 4
Engine and gear oil...	...	...	...	...	5 8 11
Tyres	...	...	...	...	11 0 0
Two new belts	...	...	...	...	1 8 2
Renewals	...	...	...	...	6 1 11
Repairs	...	...	...	...	13 0 6
Sundries	...	...	...	...	1 6 11
Insurance	...	...	...	...	7 0 0
Rent and rates of garage	...	...	...	...	5 4 0
Depreciation at 25%	...	...	...	...	18 0 0
					£95 2 9

Wages	...	...	...	...	£78 0 0
Maintenance per machine for six months	...	...	...	...	47 11 4½

By a curious coincidence this works out at a bare running cost of approximately 1d. per mile for each machine, which we consider rather unusually low. The figure is arrived at, it should be explained, by including the above items as far down as and including "Sundries" in the running costs. We should attribute it largely to the geared down belt transmission, with its saving in tyres and fuel.

### Small Points of Importance.

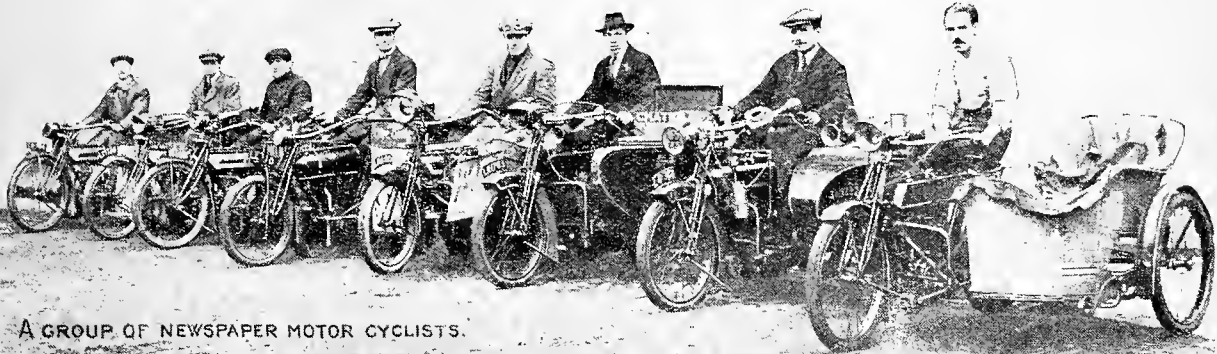
Women are now being educated to handle the machines; and, apart from all question of cost, Mr. Stephenson particularly emphasises the fact that the point of chief importance is the quickness with which deliveries are made, and the convenience thus enjoyed by customers.

Each rider is given one afternoon per week to administer a superficial overhaul, and as yet no engine or gear troubles have occurred. After covering a distance of 25,000 miles, one of the original machines was sold for £26 without sidecarrier, this being retained for attachment to the new model.

The cost of maintenance and the condition of the machine depend very largely on the driver, and no pains should be spared in teaching drivers the ordinary mechanics of motor cycling.

# THE CRAVING FOR LATEST WAR NEWS.

EXPRESS DELIVERY OF NEWSPAPERS BY MOTOR CYCLE.



A GROUP OF NEWSPAPER MOTOR CYCLISTS.

IN another part of this issue there is an article setting forth the advantages of the motor cycle for press photographers and journalists. Another branch of newspaper work in which motor cycles play their part is at the opposite end of the scale, i.e., in the delivery of the finished papers. Speed is everything in newspaper production, from the collection of the news to the delivery of the papers into the hands of the newsagents, and a more suitable vehicle than the two or three-wheeled motor cycle is difficult to find.

## Where the Sidecarrier Scores.

As the papers are printed, sidecarriers are "just the thing" to take parcels to various newsagents scattered over a big town and its suburbs. Many of the big London dailies employ this type of vehicle in addition to four-wheeled motor vans. The latter are very useful for taking big parcels to the railway termini for the distribution in the provinces, but for the smaller parcels for the Metropolis and suburbs the three-wheeler is used. It is extremely handy, occupies very little room, can dodge in and out of traffic easily, is speedy and cheap to run. The foregoing are essential points in a vehicle for newspaper work.

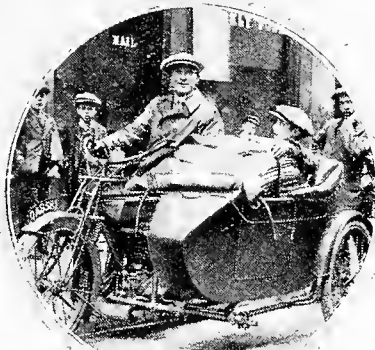
As the illustrations on this page show, sidecarriers for this class of work are not confined to London, many of the big provincial newspapers, employing them. In some cases the machines are owned

and ran by the newspaper firms themselves; in other, garages contract to deliver the papers for the newspaper proprietors.

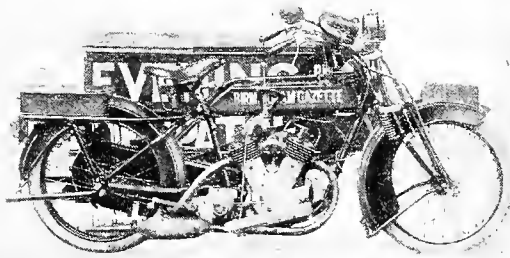
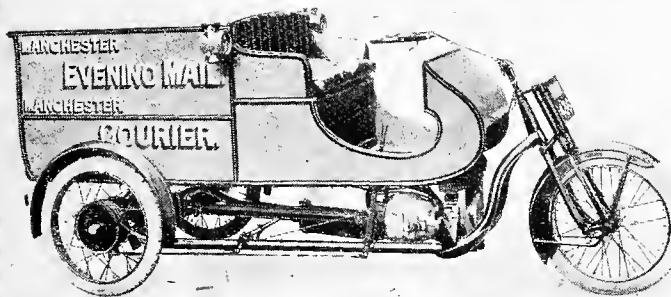
As a result of the war the necessity of getting the newspapers delivered quickly has been greatly increased. Every morning and evening everybody wants a newspaper to see the latest news, and, whereas before the war a man would probably wait an hour or two if necessary to get his favourite paper, now he buys the first to hand.

## Newspaper Delivery Contractors.

We recently called on Mr. W. R. Webb, of the Waterloo Garage, Cornwall Street, S.E., who has running contracts with *The Daily Mail*, *The Evening News*, *The Star*, *The Pall Mall*, *News of the World*, and other papers. We found him in the act of tuning up a  $3\frac{1}{2}$  h.p. clutch Triumph, which is employed in the service of *The Daily Mail*. Having introduced ourselves, we entered his little workshop with him, and immediately espied a 1905-6 5 h.p. Minerva, which he pointed out to us as one of the "has beens." It had rigid forks, and the only sign of modernisation was the fitting of a chain-driven magneto, together with a box sidecar.



Leaving the newspaper offices with the boy in the sidecar covered with papers. The outfit is a single-cylinder  $4\frac{1}{2}$  h.p. James owned by Mr. Brittain, a newsagent of Balsall Heath, Birmingham. It has been in use for over twelve months, making two trips to the city daily.



TWO TYPES OF THREE-WHEELER FOR PROVINCIAL NEWSPAPER DELIVERY.

(Left) The Wall parcel car, the driver of which sits in front. It has a useful load capacity of 6 cwt. (Right) A big Rex sidecarrier used by the *Birmingham Gazette* and *Evening Dispatch*.



### The Craving for Latest War News.—

Mr. Webb has given up the use of solo machines for newspaper delivery, as the increased loads are now too heavy to be carried by one man, consequently the sidecar is used exclusively. Mr. Webb has another  $3\frac{1}{2}$  h.p. Triumph, also a clutch model, in the employ of *The Pall Mall*. On the roof of his garage he pointed out a great box which fits on his Chater-Lea. It takes three men to place it empty on the sidecar chassis. One of the most useful machines he has had under his care was a  $2\frac{3}{4}$  h.p. Douglas, which he bought second-hand. This dragged a large box 3ft. 3in. long by 2ft. broad attached to a sidecar big enough for a  $3\frac{1}{2}$  h.p., and used with a passenger on the carrier. This excellent little machine did 2,000 miles under his care before it was sold again, which is an exceedingly creditable performance for so small an engine.

### A Double Purpose Motor Cycle.

The machines—usually owned by the men who drive them, who are paid by the newspapers at the rate of 7s. 6d. for two hours—are kept in running order by Mr. Webb. They are employed for the purpose of taking papers from the big newspaper offices in the neighbourhood of Fleet Street to the various vendors, who occupy different stations in various parts of the great Metropolis. Six of these machines are maintained by the Waterloo Garage, which at the present moment is also employed in doing a good deal of military work in the shape of repairs to officers' motor cycles. Mr. Webb's favourite mount is the No. 7 model Chater-Lea, which we illustrate. This is employed by *The Star*, *The Daily Mail*, and *News of the World*. It does, like



A big Chater-Lea sidecarrier owned by A. E. Webb and used in the Metropolitan distribution of the *Daily Mail*. At week-ends a touring body takes the place of the box body shown.

other machines used in a similar capacity, seventy miles every day in the week, and during the week-end is usually taken for a good run for recreative purposes. So far it has run between 2,500 and 3,000 miles, and has proved itself extremely economical and reliable.

### A Manchester Example.

A Lancashire newspaper, the *Manchester Courier*, which recently stopped publication, employed in its motor delivery fleet six sidecars. The following particulars are from Mr. S. D. Wilson, the motor representative of the *Manchester Guardian*, who was previously in the service of the *Manchester Courier* in a similar capacity:

"Any urgent messages required quickly and speedily were unhesitatingly given to a 4 h.p. Bradbury to execute. The hand clutch and three-speed countershaft gear box fitted made it possible to thread the traffic of the city much quicker than was found to be the case with the other machines fitted with foot-operated clutch and two-speed hub gear.

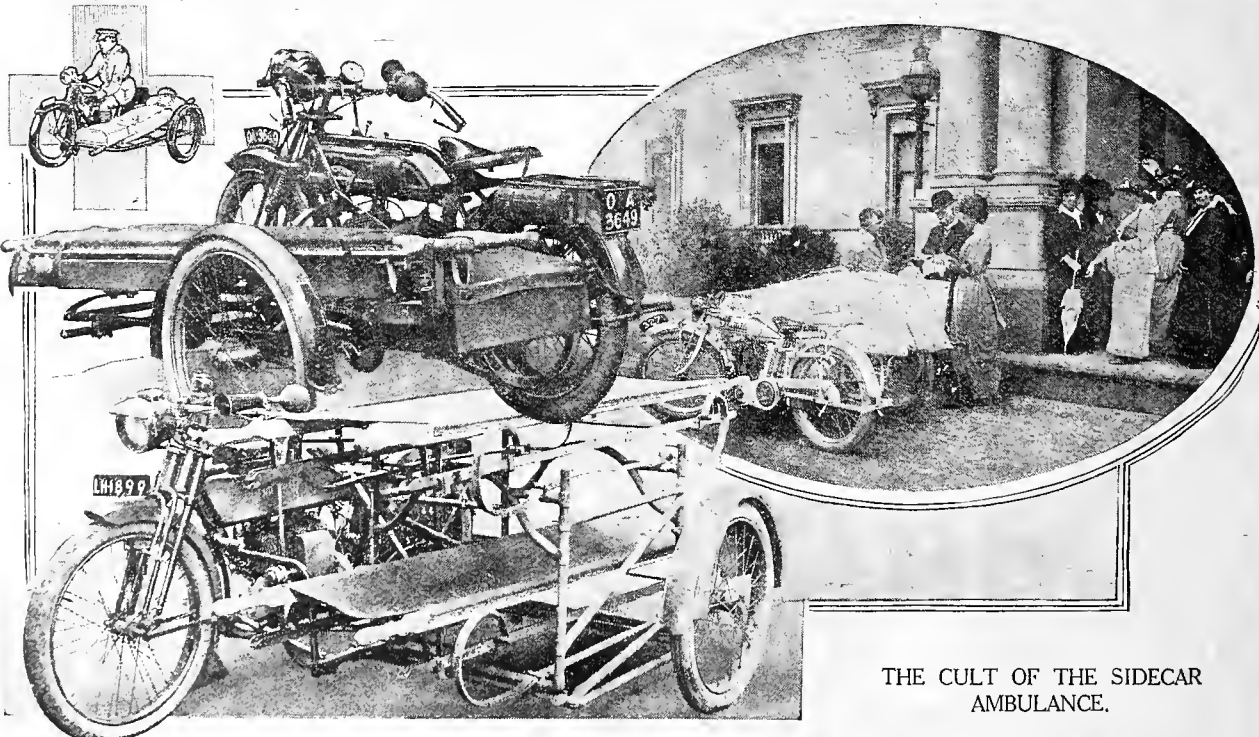
### 200 Miles a Week.

"The life of a newspaper motor van, or sidecarrier, is a very arduous one. Newspapers are taken straight from the printing machines, and are dumped down in the waiting vehicle, then to be rushed round to the big railway stations for delivery in the country.

"In many cases only five minutes were given in which to get right across Manchester to the station, when traffic was perhaps at its thickest. This routine continues regularly every day from eleven o'clock in the morning until 8 p.m. There is very little time under these circumstances for repairs and readjustments, therefore a reliable turnout for the newspaper publishing business is absolutely essential. It must further be remembered that the machines ran through all weathers, over the inferior Manchester and Lancashire roads, for a period of twelve months. The approximate mileage can safely be put at 200 miles per week for each machine. The Bradbury was by far the most economical."

These few notes show unmistakably the fitness of the sidecarrier for newspaper work.

Some missionaries in Japan are finding motor cycles very useful in their work. At present there are six mounted on Harley-Davidsons.



THE CULT OF THE SIDECAR  
AMBULANCE.

In addition to combatant service, motor cycles are being used in various duties in connection with the war, not the least important of which is their adoption as ambulances. These illustrations show a few examples of motor cycle ambulances that have been evolved as a result of the war.

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Tyseley, Birmingham.

# Tyseley.

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## SPECIAL OFFER.

7" 28/-	1" 30/-	1 1/8" 34/-	1 1/4" 36/-	USUAL PRICE for 8ft.
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**The ZILLA PATENT BELT COMPANY, Ltd.,**  
101, Great Western Street, MANCHESTER.

# I SUBMIT there

is a solid reason why you should adopt a  
**BINKS CARBURETTER, viz.:**  
**YOU CUT YOUR FUEL BILL IN TWO**

if you adopt my system and use my fuel. You can, of course, use petrol or benzol without alteration.

Price of  
Carburetter  
complete—

# 49/-

plus 10% extra  
war cost.

**FIT ANY  
MACHINE.**

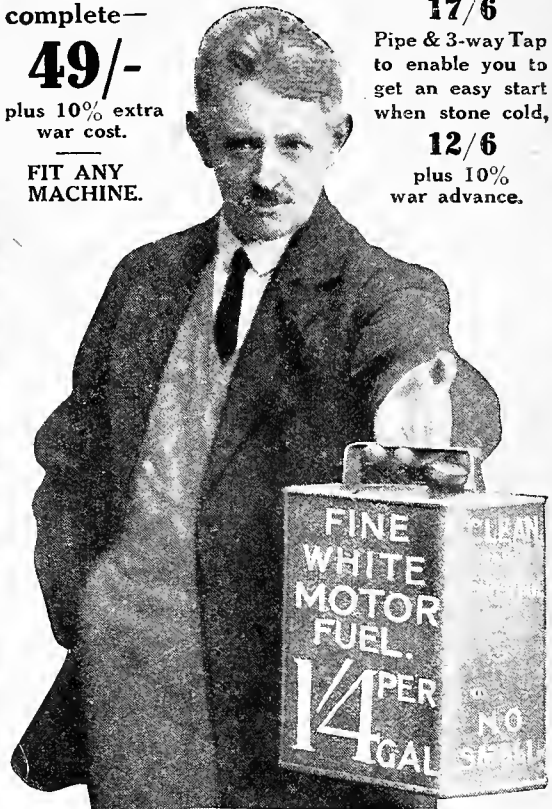
Small extra Tank  
to clip on Frame,

# 17/6

Pipe & 3-way Tap  
to enable you to  
get an easy start  
when stone cold,

# 12/6

plus 10%  
war advance.



## READ!

## MY 3-PHASE JET DAMPING CARBURETTERS

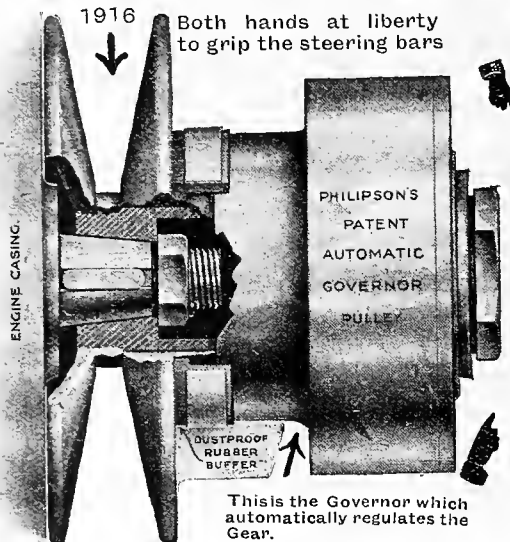
have such perfect vapourising properties that they enable you to use fuel at 1/4 per gallon in 42-gallon casks, which you are allowed to keep on your premises. Your engine will tick over dead slow, and pull dead slow in traffic, yet give the full power. It is almost impossible to tell you are not running on petrol at 2/6 a gallon. It cannot damage your engine or soot it up, and makes Motor Cycling possible in these times.

I give you my personal assurance of the truth of what is stated above. Please send at once for full particulars of the carburetter, and also for my Treatise on Carburation, and terms of One Month's Approval Trial.

# C. BINKS, Ltd., Eccles.

**YOU** cannot purchase a simpler or more perfect variable gear.  
**AS SUPPLIED TO HIS MAJESTY'S FORCES (MOTOR CYCLE SECTION)**  
**PHILIPSON'S Patent AUTOMATIC GOVERNOR PULLEY.**

(No holes or grooves in pulley flanges.)



This is the Governor which automatically regulates the Gear.

Douglas machines are wonderfully improved by fitting the Governor—Clutch models excepted.

See "The Motor Cycle," Jan. 7th, 1916, pages 4 and 5. Extract from article "Some Fads and Fancies," written by Captain A. B. Lindsay, M.B., writing of his 1914 and 1915 3½ h.p.—

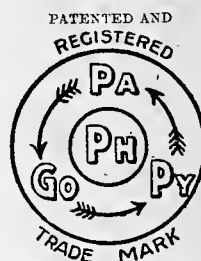
"A 'Philipson' Governor Pulley was the only gear used, and with its aid the Machine climbed some alleged roads in Glamorganshire and Breconshire, where no Motor Cycle had ever been before."

Also writing of his 1915 Brooklands Road Special—

"A variable Pulley Gear fitted gave good service, but being severe on the average rubber belt, I substituted for it a 'Philipson' Pulley and fitted up a handle-bar control. This gave a very fine variable gear, and I have yet to find the ordinary road hill that I cannot climb. Belt wear has been slight."

**ACCEPT NO GEAR AS GENUINE UNLESS IT BEARS THIS TRADE MARK**

**ENTIRELY FREE** from troublesome and weighty complications—only **2 working parts**—no levers, rods, wheels, etc., to worry about. Simply takes the place of the ordinary pulley (**one nut only secures the complete gear to the engine**)—can be fitted without any alteration to most engines in a few minutes—Send for booklet.



THIS GEAR HAS A WORLD-WIDE REPUTATION FOR SIMPLICITY AND EFFICIENCY.

SOLE MAKERS: **PHILIPSON & CO., Engineers, ASTLEY BRIDGE, BOLTON.**

Telegrams—"Safety, Bolton."

ESTABLISHED OVER 30 YEARS.

Telephone—147, Eagley.

# QUADRANT

— the

motor cycle of highest efficiency and highest value !

**CHAIN DRIVE MODEL**

Solo - £62

Combination

£74 : 10

There's no query about the 1916 Quadrant—we've made it absolutely "query-less." Note these leading features:—

**B.S.A. Countershaft 3-speed Gear**

4½ h.p. Quadrant Engine, Dunlop Tyres, Quadrant Spring Forks, Pan-seat Saddle, and Aluminium Footboards.

Now ask us for further details and—decide on a Quadrant, but order at once to ensure delivery.

**QUADRANT WORKS, Lawley St., Birmingham.**

LONDON DEPOT: - - 78, Great Queen Street, Kingsway.

**CHAIN-CUM-BELT DRIVE**

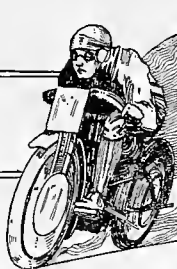
Solo - £60

Combination

£72 : 10



## QUESTIONS



## REPLIES

A selection of questions of general interest received from readers and our replies thereto. All questions should be addressed to the Editor, "The Motor Cycle," 20, Tudor Street, London, E.C., and whether intended for publication or not must be accompanied by a stamped addressed envelope for reply. Correspondents are urged to write clearly and on one side of the paper only, numbering each query separately, and keeping a copy for ease of reference. Letters containing legal questions should be marked "Legal" in the left-hand corner of envelope, and should be kept distinct from questions bearing on technical subjects.

## Removing Obsolete Screws.

**?** My machine is a 1915 counter-shaft three-speed gear model, which has only run a few hundred miles, and now requires taking down for cleaning the carbon deposit from the cylinder, but I cannot remove the exhaust pipe or the auxiliary exhaust pipe. The latter is secured to the cylinder head by two screws which have become burnt in and cannot be moved. The other pipe is a tight fit in the cylinder head, and also in the exhaust box. I tried to get the exhaust box itself off, but it would not leave the pipes. If you can give me any suggestions I shall be glad.—S.P.

The only thing you can do is to use plenty of paraffin, i.e., apply it at intervals with lubricating oil to give it a chance to soak in. If the screws have been too firmly embedded to be removed in any other way they must be drilled out. Try a pipe spanner on the exhaust pipe.

## A Motor Cycle Used for Business.

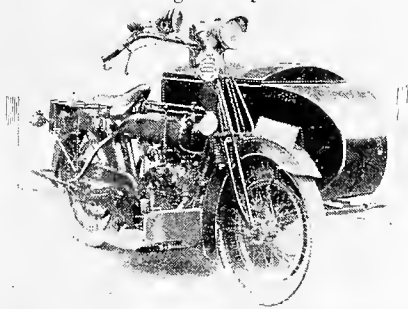
**?** I have a pedal cycle with a sidecar attached, similar to a motor cycle and sidecar, only that my carrier is a box for carrying milk cans. I have recently attached an Auto-wheel to this, now making four wheels to my machine. As I use this solely for trade purposes—the cycle and carrier being specially built—I have not yet taken out a licence. I have used it with the Auto-wheel attached for about three months. The police now threaten me with a summons for not having taken out a licence. Do you think I ought to take out a licence, seeing that I use it solely for trade purposes?—Auto.

No. Under the circumstances you are not liable to pay any local taxation licence if the machine is used entirely for business purposes—that is, the transport of goods and merchandise—and provided you have conformed to the law by painting your name and address on the vehicle in letters at least one inch in height. You could not use the motor attachment, however, at any time for your own pleasure. You must, of course, have the usual registration and driving licences.

## The Endorsement of Licences

**?** Will you kindly inform me whether one's licence can be endorsed for not having the lamps alight at the proper time? I was fined 15s. 6d. in Derbyshire for this offence, and my licence was also asked for for endorsement.—NA 3916.

We regret to say that, under the circumstances, your licence could be endorsed. This is the case with every offence under the Motor Car Act, except for the first two for exceeding the speed limit.



One of a fleet of Lea-Francis sidecarriers supplied to the Chiswick Polish Co., Ltd., makers of Cherry Blossom boot polish, for the use of their travelling representatives.

## Fitting a Switch.

**?** Would you please tell me: (1.) What is the object or advantage of a cut-out switch, and would you advise one to be fitted on a 4 h.p. 1912 model with sidecar? (2.) Is it compulsory to have front and rear lamps on a motor cycle and one on the sidecar? Also, must two brakes be fitted?—E.E.B.

(1.) The object of a cut-out switch is that you have a means of stopping the engine in the event of the throttle not closing properly or the exhaust lifter breaking. (2.) It is compulsory at the present time to have a front and rear lamp on a motor cycle. A side lamp on the sidecar, to show the width of the vehicle, is also compulsory in certain districts and desirable in every district. Two independent brakes must be fitted to every motor vehicle.

## Noisy Valve Mechanism.

**?** I have a 4½ h.p. 1916 chain-cum-belt driven motor bicycle. Would you be kind enough to enlighten me on the following: Is there any practical method of silencing noisy tappets? I have fitted light buffer springs under the heads of the tappets to keep them always in contact with the valve stems, but without success.—B.P.

There are no means of effectively silencing a noisy valve gear, though the interposition of fibre heads to the tappets diminishes the clatter. You may also partially cure noisy tappets in the way suggested in your letter, but most of the noise comes from the cams and rockers themselves. It is a most difficult matter to silence tappet gear on a highly efficient engine with quick lifting cams.

## Timing the Spark.

**?** Will you please be good enough to answer the following questions: Spark advanced: Is this when ignition takes place, say, when the piston is at the top of its stroke? Spark retarded: Is this when ignition takes place before, say, 15° of the top of the stroke? If the latter assumption is correct, what is the maximum retardation in degrees in a 2½ h.p. Douglas? What is the usual firing point (a) for level running and speed, and (b) for hill-climbing? These are elementary questions, but the misunderstanding as to the correct meaning of retarded and advanced ignition prompts me to ask your assistance.—W.F.B.

No; when the spark is advanced the ignition takes place before the piston reaches the top of the stroke. With the spark retarded the engine fires just past the top of the stroke. The period of advance and retard on the average magneto is 30°, and the method of timing a machine for general use is as follows: Place the piston exactly on top of the compression stroke and connect up the magneto with the points just about to break and the ignition lever two-thirds retarded. This will mean that the explosion when the ignition is fully retarded will take place when the piston has travelled about 1.5 mm down the firing stroke.

## PUBLISHERS' ANNOUNCEMENT.—THE RESTRICTED SUPPLY OF PAPER.

Readers of "THE MOTOR CYCLE" are urgently requested to assist in the working of the Government decision to limit the amount of paper material by always buying their copies from the same place, if possible, or by giving a definite order to a newsagent for the regular supply of the journal each week.



**Running on Paraffin.**

Q.

I shall be much obliged if you will let me know if I could satisfactorily run my 1914 6 h.p. twin motor cycle on paraffin. I have previously run a 3½ h.p. on this fuel in an emergency. Would it do any damage, and could any slight alterations be made to improve the running on this mixture? I presume for starting I could heat the carburettor. If I cannot use this I shall have to give up motor cycling.—W.B.C.

You can run the engine satisfactorily on paraffin, after first starting up on petrol, but it would be better to have a mixture of, say, two-thirds paraffin and one petrol, or, better still, half and half, since, unless the combustion is perfect, there is a liability to excessive carbonisation and pre-ignition. It would be necessary to take in hot air to the carburettor, so as to render the combustion as nearly perfect as possible. You would be well advised to study readers' experiences, which have appeared in our correspondence columns for some time past.

**Failure on Hills.**

Q.

I should be greatly obliged if you would tell me the reason for my motor cycle failing on hills. It is an old Excelsior, fitted with accumulator ignition. It goes all right on level roads, but generally fails on anything worthy of the name of a hill. I am told that the cylinder and piston are new. Do you think it is possible to have too much compression, as this really represents the symptoms when brought to a standstill on an incline? Everything, as far as I can see, is in good working order, and I can always get a good spark.—A.G.

The trouble is possibly due to over-heating. If the piston is new it is quite possibly a tight fit in the cylinder, and when the engine gets hot there is a

tendency for the piston to seize. Possibly, also, the piston rings are a shade tight. In either case the trouble will probably disappear after a little running. Are you giving sufficient oil? If doubtful, try a pumpful every eight miles until the new piston and cylinder are run in.

**READER'S REPLY.****Difficult Starting.**

I see endless queries in your paper re difficult starting, and some three weeks ago there was such a query from a reader with a similar gear to mine. He proposed fitting a decompressor. I am a novice, and I used to find starting an abomination. Many times I exhausted myself, and once or twice I had to give the job up. Perhaps my unorthodox plan may be of use to sufferers. I found the decompressor of little help, and for some reason the injection cock was removed from the cylinder head when the decompressor was fitted. I now unscrew the plug, inject a little petrol with an ordinary oiler, and turn the engine over a few times *with the plug out*. A drop of petrol on the plug points, the plug replaced, throttle about one-third open, air closed, spark almost fully advanced, and it fires first time. The whole job takes less than five minutes, and saves knuckles, energy, and language! Perhaps I am doing something silly, but if your correspondent will try the dodge he will probably find it as effective as I have done. The only thing I can see is that the plug asbestos washer may need more frequent renewal.—TYRO.

[It is a laborious method to remove the plug. The same effect would be obtained by injecting a squirt of paraffin occasionally whilst turning the engine over. We should therefore recommend our correspondent to remove the decompressor, which, he says, is of little use, and replace the compression tap.—ED.]

**RECOMMENDED ROUTES.****COVENTRY TO HEDNESFORD.—H.N.**

Coventry, Stonebridge, Castle Bromwich, Erdington, Brownhills, Cannock, Hednesford.

**WALKDEN (LANCS) TO WARSOP (NOTTS).—A.B.**

Walkden, Worsley, Patricroft, Stretford, Stockport, Chapel-en-le-Frith, Balstow, Chesterfield, Mansfield, Warsop.

**NEWPORT (MON.) TO MANCHESTER.—A.J.R.**

Newport, Usk, Raglan, Monmouth, Hereford, Leominster, Ludlow, Craven Arms, Church Stretton, Shrewsbury, Whitechurch, Tarporley, Northwich, Altrincham, Manchester. Approximately 160 miles.

**CASFLEFORD TO WIGTON.—E.C.**

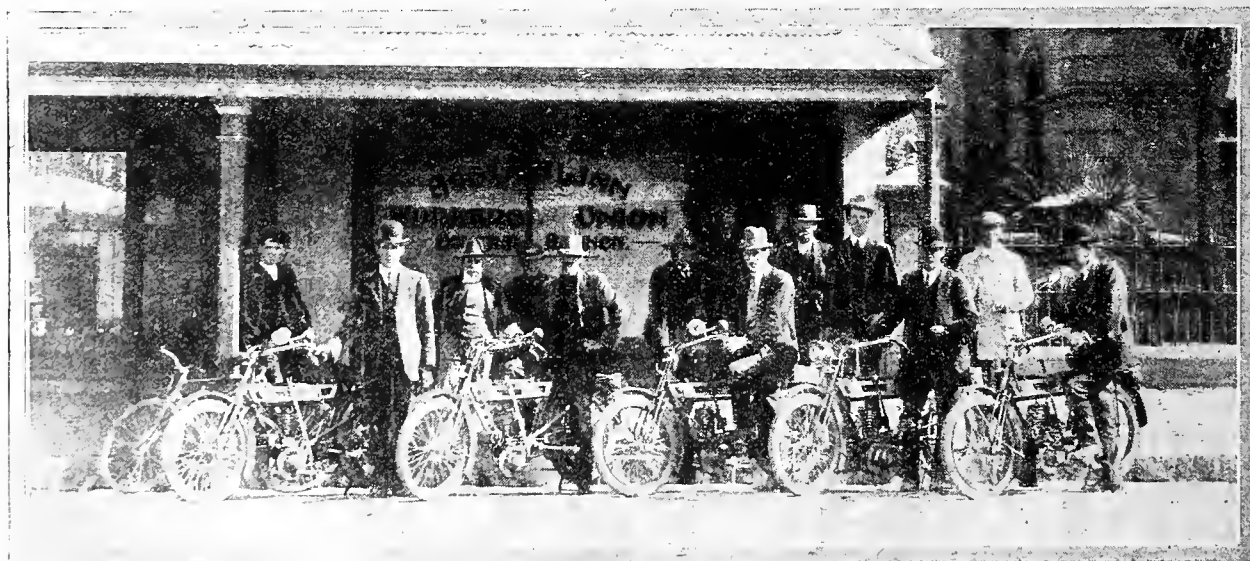
Castleford, Aberford, Wetherby, Boroughbridge, Leeming, Scotch Corner, Barnard Castle, Bowes, Brrough, Appleby, Penrith, Skelton, Sebergham, Wigton. Approximately 123 miles.

**WELLS TO PLYMOUTH.—C.B.**

Wells, Glastonbury, Dürston, Taunton, Wellington, Cullompton, Exeter, Chudleigh, Ashburton, Ivybridge, Plymouth. Approximately 58 miles.

**CLAPHAM COMMON TO CLACTON-ON-SEA.—R.J.S.**

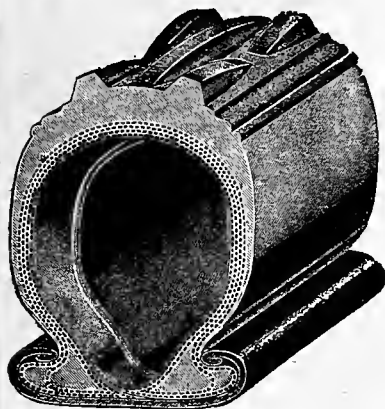
Clapham, Victoria Bridge, Buckingham Palace Road, Grosvenor Place, Park Lane, Oxford Street, Orchard Street, Marylebone Road, Albany Street, Seven Sisters Road, straight away to Tottenham, then make your way along the road leading to Epping Forest, past Blackhorse Road Station, and straight on till you come to Woodford, then go through Epping, Ongar, Chelmsford, Witham, Colchester, to Clacton.

**THE MOTOR CYCLE FOR BUSINESS PURPOSES IN AUSTRALIA.**

Five of the organisers of the Australian Workers' Union, with their L.M.C. machines, who travel to very remote parts of the Commonwealth. The long journeys over rough roads and through scantily populated country are a good test for the machines. On the carriers the men carry their "swags," weighing about 150 lb.

# TYRE ECONOMY

## SPECIAL CLEARANCE LINES (Discount allowed to the Trade.)



Continental Autobi for-voiturette Rims.

Specially suitable for heavy machines.  
650 x 65, 21/6 List Price, 39/6.

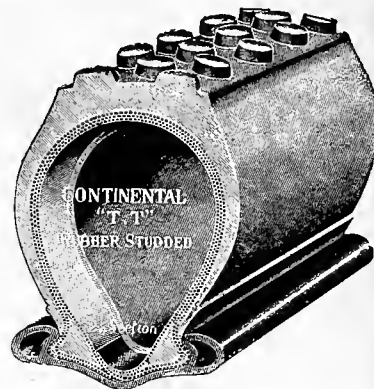
### TYRES for TRADESMEN'S SIDECARRIERS.

Extra heavy tyres are necessary to withstand the hard and constant work that a Sidecar is called upon to perform day by day.

Here is an opportunity to secure, at specially low prices, tyres that are eminently suitable for the purpose.

By purchasing either of these special lines, Tradesmen can ensure economy in running and freedom from tyre troubles.

Special attention is drawn to the thickness of the treads, which means long life.



Continental T.T. Studded Heavy.

26 x 2 1/2 .. 21/6. List Price 34/-

Elite Heavy.

Guaranteed 3,000 miles.

Suitable for 3 1/2 h.p. machines.

18/6. Special Offer.

#### COVERS.

CONTINENTAL.	Our Price.	List Price.
26 x 2 1/2 Standard .....	14/6	23/9
28 x 2 1/2 " .....	15/-	25/-
28 x 2 1/2 " .....	17/6	27/6
26 x 2 1/2 " wire-on .....	10/-	25/-
26 x 2 1/2 Model de Course .....	18/6	33/3
28 x 2 1/2 " .....	18/-	34/-
26 x 2 1/2 T.T., basket pattern .....	17/6	28/-
26 x 2 1/2 " heavy .....	21/6	34/-
650 x 65 Autobi .....	21/6	39/6
650 x 65 Fluted pattern .....	18/-	28/3
650 x 75 or 700 x 80 Autobi rub. stud.	27/6	44/3
650 x 65 Heavy Fluted ..	19/-	33/-

#### CLINCHER.

24 x 2 De Luxe Cover and Tube complete .....	17/6	—
26 x 2 1/2 De Luxe .....	21/-	32/-
26 x 2 1/2 " .....	23/6	36/3
26 x 2 1/2 for 2 1/2 De Luxe, wire-on ..	21/-	37/6
26 x 2 1/2 Dreadnought .....	27/6	40/-
26 x 2 1/2 x 2 1/2 " .....	32/6	40/-
26 x 2 1/2 A Woa, rubber-studded ..	19/6	32/-
26 x 2 1/2 " .....	22/6	32/-
26 x 2 1/2 " ribbed .....	14/6	27/6
26 x 2 1/2 B quality, rubber-studded	13/6	26/6
26 x 2 1/2 x 2 1/2 De Luxe, extra heavy	25/-	36/6

#### KEMPSTALL.

26 x 2 1/2 Heavy Anti-skid .....	22/6	32/6
26 x 2 1/2 " .....	26/-	37/6
26 x 2 1/2 " Non-skid .....	30/-	—

#### COVERS.

##### WOOD-MILNE.

26 x 2 Grip-ribbed, heavy .....	15/9	26/9
26 x 2 " extra heavy .....	20/9	32/-
26 x 2 Combination, extra heavy ..	24/6	45/-
26 x 2 Grip-ribbed, heavy .....	17/6	29/-
26 x 2 1/2 " extra heavy .....	22/6	36/-
26 x 2 1/2 " heavy .....	17/6	30/6
26 x 2 1/2 " heavy .....	22/6	32/9
(for 2 1/2 rims) " extra heavy ..	27/6	40/-
" Combination, heavy .....	30/-	48/-
26 x 2 1/2 Grip-ribbed, heavy .....	20/-	31/6
(for 2 1/2 rims) " extra heavy ..	25/-	39/-
26 x 3 Grip-ribbed, heavy .....	21/-	36/6
(for 2 1/2 rims) " extra heavy ..	26/-	44/-
28 x 2 1/2 " heavy .....	16/6	31/9
28 x 2 1/2 " extra heavy .....	21/-	39/-

##### HUTCHINSON.

28 x 2 1/2 Passenger .....	29/6	45/-
----------------------------	------	------

### SPECIAL FOR 28x3 AMERICAN RIMS.

Dominion (for back wheel work) .....	50/-	—
Clincher Dreadnought .....	42/6	—
Clincher De Luxe .....	35/-	48/6
Wood-Milne Grip Ribbed and Grooved ..	32/6	48/-

#### TUBES.

CONTINENTAL.	Our Price.	List Price.
26 x 2 Butted only .....	4/9	8/3
26 x 2 1/2 " .....	5/3	8/9
26 x 2 1/2 x 2 1/2 Endless only .....	5/9	8/9
650 x 75 or 700 x 80 (endless only) ..	6/-	14/-
28 x 2 1/2 (endless only) .....	7/-	10/6
Butted, 1/- extra.		

#### ELITE (fully guaranteed).

26 x 2 1/2 .....	5/9	7/9
28 x 3 .....	9/6	13/-
Butted, 1/- extra.		

#### CLINCHER.

24 x 2 .....	3/9	6/6
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#### BELTS.

CONTINENTAL.	per foot.	
1 1/2 in. section .....	1/3	2/2
2 in. " .....	1/-	1/11

#### CLINCHER FLEXIS.

	per foot.	
1 1/2 in. section (8' 6" lengths only) ..	1/6	2/6
1 in. " (7' 4" and 7' lengths only) ..	1/3	2/1
3/4 in. " (7' lengths only) .....	1/-	1/9

### RETREADING.

Special Heavy, 15/-; Heavy, 12/6; Medium 10/-; Sludded or Ribbed Retreads.

Sections on application.

TIME REQUIRED, 3 TO 4 DAYS FROM RECEIPT OF COVER.

We offer a 3/- Outfit free of charge to all purchasers of goods to the value of £1 and over.

ALL MAKES OF TYRES IN STOCK.

All goods sent on seven days' approval against remittance. Carriage forward, unless postage is sent.

**McGuarantee**

all these goods to be quite new, and are prepared to replace any tyre that proves faulty at a price proportionate to the mileage obtained.



These treads when fitted make the cover equal to the heaviest cover manufactured.



These treads when fitted make the cover equal to the heaviest cover manufactured.

**ELITE RUBBER Co., Ltd.,**

266, Vauxhall Bridge Rd., Victoria, S.W.

Phone: Victoria 6553.

One Minute Victoria Station.

In answering this advertisement it is desirable to mention "The Motor Cycle."

# MISCELLANEOUS ADVERTISEMENTS.

## PRICES.

**ADVERTISEMENTS** in these columns—First 12 words or less 1/6, and 3d. for every two words after. Each paragraph is charged separately. Name and address must be counted. Series discounts and special terms to regular trade advertisers will be quoted on application.

Postal Orders sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd., and crossed** & Co.

All advertisements in this section should be accompanied with remittance, and be addressed to the offices of "The Motor Cycle," Hertford Street, Coventry. To ensure insertion letters should be posted in time to reach the offices of "The Motor Cycle," Coventry, or London (20, Tudor St., E.C.), by the first post on Friday morning previous to the day of issue.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement, and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## NUMBERED ADDRESSES.

For the convenience of advertisers, letters may be addressed to numbers at "The Motor Cycle" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge. Only the number will appear in the advertisement. All replies should be addressed, "No. 000, c/o 'The Motor Cycle,' 20, Tudor Street, E.C."

## DEPOSIT SYSTEM.

Persons who hesitate to send money to unknown persons may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Motor Cycle," both parties are advised of this receipt.

The time allowed for a decision after receipt of the goods is three days, and if a sale is effected we remit the amount to the seller, but if not we return the amount to the depositor, and each party to the transaction pays carriage one way. For all transactions exceeding £10 in value, a deposit fee of 2s. 6d. is charged, when under £10 the fee is 1s. All deposit matters are dealt with at Coventry, and cheques and money orders should be made payable to Iliffe & Sons Limited.

The letter "D" at the end of an advertisement is an indication that the advertiser is willing to avail himself of the Deposit System. Other advertisers may be equally desirous, but have not advised us to that effect.

## SPECIAL NOTE.

Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post.

## MOTOR CYCLES FOR SALE.

### A.J.S.

A.J.S. New 1916 6h.p. Combination, and 2½h.p. sporting models here waiting.—Moss, Wem. [X2823]

A.J.S. 2½h.p., 3-speed, 1,700 miles used: £48.—Turpin, 22-29, Preston Rd., Brighton. [0716]

A.J.S. 2½h.p., 1912, splendid condition, speedometer: £15/10.—1, Priory Rd., Kew Green, W. [7429]

A.J.S. 1916 6h.p. Dynamo Combination, hood, screen, delivery from stock.—Parker, 71, Bradshawgate, Bolton. [X2745]

A.J.S. 6h.p. Combination, done about 1,000 miles; first-class lot: £82/10.—Pittman, 29, Hill Rd., Wimborbton. [7433]

A.J.S. 1914 6h.p. Combination, 3-speed, kick starter, Lucas lamps, spare tyre, tubes, etc., very little used: £75, or nearest.—Syed, 40, Victoria Rd., Oswestry. [7264]

A.J.S. Combination, 6h.p., 3-speed countershaft gear box, hand-operated clutch, kick starter, fitted with detachable and interchangeable wheels, with Avon heavy 650x65 tyres, spare wheel and new tyre, Lucas dynamo lighting set and 3 lamps, adjustable wind screen, large hood, luggage carrier, large pannier, Stewart mechanical horn, and full kit of tools: bought new late 1915, has done less than 500 miles, and condition practically as new: price £115; deferred payments arranged, 2% only extra.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [7218]

## Halifax Motor Exchange

68, HORTON ST., HALIFAX.

'Phone—766.

Telegrams—"Perfection."

### NEW MODELS.

MORGANS, Sporting and de Luxe Models in stock.  
LEVIS, 2½ h.p., 2-stroke ..... £32 0  
EXCELSIOR (American), 7 h.p., 3 speeds ..... £62 9  
EXCELSIOR (American), electrically equipped £71 10  
NEW IMPERIAL, 2½ h.p., variable magneto £38 0  
OVERLAND, 12 h.p., 4-seater, electric starting and lighting; new tax, 8 guineas .. £225 0  
RITZ 4-cylinder 2-seater Light Car ..... £145 0  
CONNAUGHT, 2½ h.p., 2-speed ..... £41 16  
ROYAL RUBY, 2½ h.p., 2-speed, 2-stroke .. £36 10  
ROYAL RUBY-J.A.P., 2½ h.p., 2-speed ..... £39 10  
ROYAL RUBY, 6 h.p., 3-speed, shop-soiled £67 0  
REX, 6 h.p., kick start, and Rex Sidecar .. £71 0  
WILLIAMSON Cy-cl-ca, W.C. Douglas engine £126 0

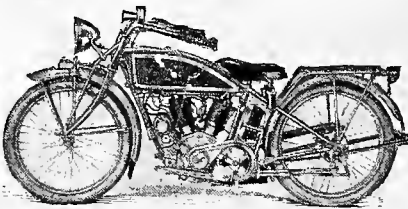
### (U.S.A.) EXCELSIOR.

7 h.p., twin, 84 x 89, mechanical and hand lubrication, kick starter, high-tension magneto, spring forks, 2-gallon petrol capacity, 3 speed countershaft gear, multiple disc clutch with hand and foot control, handle-bar control, spring seat-pillar, gin, non-skid tyre, finish Excelsior grey: £62. Or with electrical equipment: £71 10s. Tax £1.

Exchanges quoted. Easy payments arranged.

We are sole Yorkshire distributors. Liberal terms to trade.

Coachbuilt PERFECTION SIDECARS to suit, £13 10



### SOLO MACHINES.

DOUGLAS, War Office model, 1916 delivery £45 10  
1915 2½ h.p. 2-stroke 2-speed IVY ..... £26 10  
1915 SUN-VILLIERS, 2-stroke ..... £21 10  
1914 6 h.p. 3-s.p. GLYN, detachable wheels £39 10  
1913 3½ h.p. ROVER, Grado gear ..... £27 10  
1912 3½ h.p. ZENITH-GRADUA ..... £26 10  
1912 3½ h.p. 2-s.p. BRADBURY, chain drive £29 10  
RUDGE, 3½ h.p., F.E., good order ..... £19 19  
EXCELSIOR, 3½ h.p., 3-speed, Druid forks .. £19 19  
TRIUMPH, 3½ h.p., 1912 T.T. model (touring bars), very smart and speedy ..... £26 10  
KERRY, 3 h.p., magneto, Saxon forks ..... £9 15  
P. & M., 3½ h.p., 2-speed, very smart ..... £25 10  
REX, 1908, twin, 2-s.p., F.E., wants attention £12 10  
DOUGLAS, 2½ h.p., twin, spring forks ..... £15 10  
TRIUMPH, magneto spring forks, new tyres £18 10

### SIDECAR COMBINATIONS.

1914 6 h.p. ARIEL, chain drive, and Sidecar £45 0  
1914 6 h.p. REX Sidecar, almost as new ... £49 10  
1913 6 h.p. 2-speed REX and Sidecar ..... £43 10  
QUADRANT, 7-9 h.p., 2-speed, twin, chain drive, and coach Sidecar. Fine lot. .... £49 10  
1910 6 h.p. REX, 2-speed, and Sidecar ..... £24 10  
1912 3½ h.p. 2-speed PREMIER and Sidecar £33 10  
1910 3½ h.p. 2-speed REX and Sidecar ..... £24 10  
P. & M., 3½ h.p., 2-speed, and Sidecar ..... £19 19  
J.A.P., 8 h.p., F.E., and coach Sidecar .... £17 10

### MISCELLANEOUS.

G.W.K., 2-seater, all accessories ..... £92 10  
1915 4-cyl. ENFIELD, dynamo lighting ..... £175 0  
RENO 15 h.p. 4-cylinder Touring Car ..... £65 0  
ROVER, 8 h.p., 4-seater, all on ..... £39 10  
1914-5 MORGAN Grand Prix, well equipped £98 10  
MORGAN, 8 h.p., repainted, as new ..... £67 10  
BRAMBLE Coach-built Sidecar (new) ..... £15 10  
WILLIAMSON Sidecar, as new ..... £12 10  
1915 REX Coach Sidecar, with apron (new) £12 10  
New Mechanical Horns; usual price 25/- .. 17/11

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Under the provisions of the above Act, advertisers requiring workmen, and whose business consists wholly or mainly of engineering or the productions of munitions of war, or substances required for the production thereof, and whose works are situated within 30 miles of London, must include in every such advertisement the words, "No person resident more than 10 miles away, or already engaged on Government work, will be engaged."

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## MOTOR CYCLES FOR SALE.

### A.J.S.

A.J.S. 2½h.p., 2-speed, 1916, actually in stock: £55; Douglas part payment considered.—Campton Garage, London Rd., Derby. [7269]

### Alldays.

ALLDAYS Matchless, 3½h.p., single-speed: £18; 1913 model.—21, Tindal St., Chelmsford. [6976]

1916 Allon 2-speed, perfect: 33 gns.—Troward, 78, High St., Harpenden. Phone: 5392. [7397]

ALLDAYS Allon, 2-speed, new; special bargain, £38/17 cash; gradual payments 2%.—Referee Cycle Co., 332, High Holborn. [0763]

COLMORE Depot, 31, Colmore Row, Birmingham, can supply immediately all models of Alldays Allon. [0796]

ALLON, 2½h.p., 2-stroke, 2-speed model, splendid condition: £30; guaranteed.—Wauchope's, 9, Shoe Lane, London. [7448]

ALLON, 2½h.p., 1915 (Oct.), spare tyre, tube, belt, excellent condition: £28-5, Fern Cottages, Reading Rd., Farnborough, Hants. [7294]

ALLON, 1916, 2½h.p., 2-speed, clutch, kick starter: cost £47; only hidden few miles, like new: 39 gns.—Scott, 16, Elmstone Rd., Fulham, London, S.W. [X2728]

ALLDAYS Matchless, 2-stroke, 1914, Armstrong 3-speed, clutch, tyres (Dunlops) and condition excellent: £25, or offer.—Wilson, 1, The Schools, Shrewsbury. [X2665]

ALLONS, single speed £36, 2-speed £42, 2-speed clutch £45; actually in stock; also 1915 single-speed model with accessories. £26/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7328]

### Antoine.

ANTOINE, 3½h.p., m.o.v., B.B. carburettor, electric ignition, good running order: £7-455, York Rd., Wandsworth. [7422]

3½h.p. Antoine, Bosch, B. and B., m.o.v., Druids, 32 lamp, horn, leather belt, good low machine, running order: £10, officers.—Turley, 45, High St., Rust-hall, Kent. [7385]

### Ariel.

ARIEL, 3½h.p., Bosch mag., good tyres, horn, fast, good running order: must sell, £12.—Post Office, Little Downham. [7353]

COLMORE Depot, 31, Colmore Row, Birmingham, have in stock for immediate delivery all models of Ariel motor cycles, with or without sidecars. [0797]

ARIEL 1915 5-6h.p. Twin, 3-speed countershaft, hand-controlled clutch, kick start, condition perfect, lamps, and spares: £49.—Broomlee, Church Rd., Farnborough, Hants. [7375]

### Auto-Wheels.

AUTO-WHEEL for sale, in good condition, little used: £8, or near offer.—34, The Crofts, Witney, Oxon. [X2209]

AUTO-WHEEL, 1914, little used, very fast, £8/10; with lady's Rudge, £10.—Hartley, 57, Gloucester Gardens, Paddington. [7343]

WALL Auto-wheel, complete, little used, equals new; bargain, £8/10.—Murray, 37a, Charles St., Hatton Garden, Holborn. [X2753]

AUTO-WHEEL, perfect condition, just overhauled, engine cleaned (bell sent); sell £7/10.—Auto-Wheel, Constitutional Club, Leicester. [X2677]

## MOTOR CYCLES FOR SALE.

## Auto-Wheels.

**A**UTO-WHEEL, unpunctured tyre, spares, seen running by appointment; £7/10.—1, Oak Common Cottages, Hesthrow, near Hounslow, Middlesex. [7437]

## Bat.

**B**AT, 1913, 8hp. twin J.A.P., overhead, T.T., round tank, in nice order; £25.—Warren's, 6, Warren St., London. [7447]

**1914** Bat-Jap, 5.6hp., 3 speeds, countershaft, electric lamps and horn, fast; £45, or offer.—455, York Rd., Wandsworth. [7423]

**B**AT-J.A.P., 6hp. twin, 2-speed, free, chain drive, Canelet coachbuilt sidecar, speedometer, F.R.S. lamps, spares, perfect condition; £42, or near, or exchange lightweight and cash; reason, car.—Fancett, (Glenfield, Ightham, Sevenoaks, Kent. [7307]

**B**AT-J.A.P., 1912, or 1913, 8hp., Enfield 2-speed, spring frame, X'fall saddle, car tyres, coachbuilt sidecar, just upholstered and renovated, complete, large Lucas car lamp on sidecar, P. and H. lamp set, mechanical horn, watch, and mirror, 2 spare valves; £38; exchange entertained.—Ideal Cycle Co., Thundersley, Essex. [7359]

## Blackburne.

**B**LACKBURNE Coachbuilt Combination, 1914, 3-speed, handle-bar clutch, re-enamelled, 40 gns.; separate.—Troward, 78, High St., Hampstead. Phone: 5392. [7399]

## Blumfield.

**B**LUMFIELD, twin, 3½hp., single-speed, very fast; £17.—21, Tindal St., Chelmsford. [6977]

## Bradbury.

**1912** Bradbury, Lloyds 2-speed gear, excellent condition; £25.—Parker and Son, St. Ives, Hunts. [7352]

**B**RADBURY, 4hp., excellent condition; £18, reason, able offer.—Jarmain, Stratford St. Mary, Colchester. [7533]

**L**ATE 1914 4hp. Bradbury, 2 speeds, very little used, free engine; £29.—Harris, 16, Castle Green, Penistone. [7322]

**B**RADBURY, 1912, 4¼hp., tyres good, 2-speed; £20, or near.—Lt. Sherrard, 3/5th Essex, Halton Camp, Bucks. [X2615]

**1914** 3½hp. Bradbury, 3 speeds, wicker sidecar; £35; cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea. [0822]

**1912** 4hp. Bradbury, fine condition, new back tyre, inner tube, and belt; £20.—Bowden, 79, Holt Rd., Birkenhead. [X2711]

**B**RADBURY, 4hp., clutch model, late model, absolutely in splendid order; £20.—Speechley, 45, Church Rd., Acton. [7481]

**B**RADBURY, 4hp., Brampton variable pulley, coachbuilt light sidecar, splendid condition; £32.—Broom, 77, Marylebone Lane, London, W. [7286]

**B**RADBURY and Sidecar (adult and child), 4-point, Mabon clutch, good condition; £20, offers; also accessories.—Wall, 104, Lansdowne Rd., Dalston, London. [X2606]

## Brough.

**B**ROUGH, 1912, 3½hp., single-speed, just been rebuilt and enamelled; bargain, £20.—2, St. Ann's Well Rd., Nottingham. [X2785]

**3½**hp. Brough, 1916 open frame model, 3-speed engine, fast machine, 60 miles per hour road, 70 miles track; 60 gns.—Wauchopes, 9, Shoe Lane, London. [7462]

## Brown.

**B**BROWN, 2½hp., seen running; great bargain, £5/10.—Speechley, 45, Church Rd., Acton. [7482]

**1912** Brown, 3½hp., overhauled makers; 16 gns.—Troward, 78, High St., Hampstead. Phone: 5392. [7398]

## B.S.A.

**1916** B.S.A. Model K in stock.—Parker and Son, St. Ives, Hunts. [7348]

**C**OLMORE Depot, 261, Deansgate, Manchester, for immediate delivery of B.S.A. [0798]

**B.S.A.** Models H and K in stock; immediate delivery.—Colmore Depot, 261, Deansgate, Manchester. [6024]

**1914** 4¼hp. B.S.A. and Coronet sidecar, coachbuilt, 3-speed, chain drive, lamps, D.A. outfit, and horn, complete; 55 gns.—W. Roberts, Thame. [7474]

**1914** B.S.A., 4¼hp., chain-cum-belt 3-speed countershaft, coachbuilt sidecar, good condition; £50.—McNair, Meadowhill Rd., King's Norton, Birmingham. [X2683]

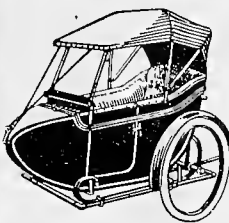
**B.S.A.** 1913½, 2-speed, chain drive, kick starter, footboards, torpedo sidecar and cape, perfect, just overhauled; £39.—"Whitecotte," Petersham Av., Byfleet, Surrey. [7534]

**B.S.A.** 4hp., 1914, chain driven, 3 speeds, countershaft, kick start, little used, all accessories, basket sidecar, all tyres as new; £45.—Lieut. Guy, New Ranges, Shoeburyness, Essex. [X2737]

**B.S.A.** Models H and K delivered from stock, also 1914 all-chain 3-speed £42, 1912 2-speed £30, 1914 all-chain drive and Corvette sidecar £49.0.0. generous deferred terms.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7331]

## CORONET SIDECARS.

We are building special models for Harley-Davidsons, Excelsiors, and Indians, enamelled either grey or red to match machines, and fitted with 28x3in. tyre and four point attachment.

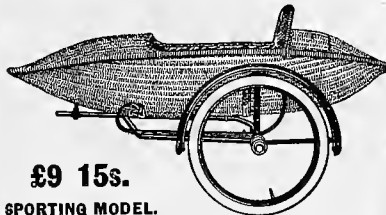


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## 7-9 h.p. HARLEY-DAVIDSON.

11J, electrically equipped, 3 speed ..... £76 13  
11F, standard 3 speed model ..... £68 5  
Cash Offers Wanted.

## CASH OFFERS WANTED.

7-9 h.p. INDIAN, 1915, 3-speed electrical model, and £18 Montgomery Sidecar .. £69 15  
1916 7-9 h.p. HARLEY-DAVIDSON ..... £80 15  
1916 ditto, electrical model ..... £89 0  
7-h.p. INDIAN, 1915, electric model, with Millford £18 18s. Sidecar, screen ..... £75 0  
8 h.p. ZENITH, 1913, Zenith gear ..... £29 15  
2½ h.p. WOLF, 1916, 2-stroke, 2-speed ..... £33 10  
20 h.p. FORD Van, new, 1916 model ..... £130 0  
20 h.p. FORD Van, 1915 model ..... £90 0  
6 h.p. REX, 1912, 2-speed model ..... £25 0  
2½ h.p. TYLER, 1915, 2-speed model ..... £24 15  
3 h.p. TRIUMPH, 1910 model ..... £18 15  
3 h.p. LINCOLN-ELK, 1912 model ..... £14 15  
5 h.p. INDIAN, 1915, 3-speed, finished red, beautiful condition ..... £55 0  
2½ h.p. ENFIELD, 1912, 2-speed ..... £15 15  
3 h.p. TRIUMPH, 1912, Phillipson pulley ..... £26 15  
3 h.p. GLYDE, M.O.V. .... £4 15  
4 h.p. NEW HUDSON, 1915, 3-speed model, with £13 coach Sidecar ..... £55 15  
2½ h.p. ENFIELD, 1912, 2-sp., chain drive ..... £15 15  
2 h.p. QUADRANT, spring forks ..... £3 15  
2½ h.p. Machine with P. & M. engine .... £2 15  
3 h.p. LINCOLN-ELK, 1911, magneto ..... £12 15  
3½ h.p. TRIUMPH, 1911, 2-speed model, with Sidecar, lamps, and horn ..... £23 15  
2½ h.p. PREMIER, 1912, 3-speed model ..... £20 15  
7-9 h.p. HARLEY-DAVIDSON, electrically equipped, complete with sidecar ..... £69 15  
3½ h.p. HUMBER, 1911, 2 speed ..... £17 15  
4 h.p. ZENITH, 1911, variable gear ..... £18 15  
1915 TRUMBULL Light Car, hood, screen, detachable wheels, speedometer, electric horn and lamps ..... £89 0

## MISCELLANEOUS BARGAINS.

New £5 Weatherproof Magneto, £3 10s.; B. & B. Carburettor, 12/6; Amac Carburettor, 12/6; Good complete Sidecar, £32/6; Burbury £13 Coach Sidecar, £6 5s.; 1½ h.p. Petrol Stationary Engine, 2 flywheels, electric ignition, £4 15s.; Coach Sidecar, underslung frame, £5 5s.; Wicker Sidecar, enclosed body, £42/6; Sidecar Chassis, with tyre, 27/6; Lightweight Coach Sidecar, new, £7 15s.; Jones Speedometer, 25/-; New Coach Sidecar Body, £3 5s.; New Sidecar Chassis, complete with all fittings, 65/-; 1916 Binks Carburettors (your old carburettor taken in exchange).

WANTED to buy 2 FORD CARS, bodywork unimportant.

**BOOTH'S MOTORIES,**  
PORTLAND PLACE, SKIRCOAT ROAD,  
HALIFAX.

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Close at 6 p.m.

## MOTOR CYCLES FOR SALE.

## B.S.A.

**F**OR Sale, B.S.A., 1916, 4¼hp., with sidecar, hood, screen, carrier basket, lamps, and Stewart, werner, and speedometer; price £75.—A. G. Bathard, North Elm Farm, Chew Magna, nr. Bristol. [7271]

**B.S.A.**, late 1915, 4¼hp., chain drive, countershaft 3-speed, clutch, kick starter, Dunlops, ridden under 350 miles as new; £50; seen in London, or at 87, Thornbury Rd., Osterley, Isleworth, W. [7192]

## Burford.

**B**URFORD-VILLIERS 2-stroke Motor Cycle, 1915, as new; bargain, £25.—Eastone's, 228, Pentonville Rd., King's Cross, London, N. [7217]

## Calthorpe.

**C**ALTHORPE, 2-speed, 2¼hp., 4-stroke, in good condition; £18.—Write, Brook, Burnham, Somerset. [7265]

**C**ALTHORPE, 2¼hp., 3-speed, free engine, splendid condition; ride 50 miles buyer.—Harness, Burgh, Lincs. [X2779]

**C**ALTHORPE Junior, 1915 model, run 800 miles, 2-speeds; as new.—Harford and Co., Station Rd., Canterbury. [6987]

**C**ALTHORPE-J.A.P., 2-speed, purchased last September, not ridden for some months; £26, or offers.—Parker and Son, St. Ives, Hunts. [7350]

**1914** Calthorpe, 2-stroke, 2-speed, tyres in good condition; very great bargain, 18 gns.—Julians, Broad St., Reading. Phone: 1024. [X2413]

**C**OLMORE Depot, 31, Colmore Row, Birmingham, have in stock all models of Calthorpes for immediate delivery; also at our Manchester Depot. [0799]

**C**ALTHORPE, 2¼hp. J.A.P., with Enfield 2-speed gear, brand new, shop-soiled only; list £36/15, accept £35.—P. J. Evans, John Bright St., Birmingham. [X2705]

**1916** 2¼hp. Calthorpe-Jap (nominally second-hand), Enfield 2-speed, run 100 miles; £35; cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea. [0825]

**C**ALTHORPE Motor Cycles, 1916 models.—Just arrived; 2-stroke 2-speed 31 gns., J.A.P. 2¼hp. 2-speed 36 gns.; easy terms arranged.—Storey's, 118, Gt. Portland St., W. [0777]

**C**ALTHORPE-J.A.P.'s and 2-strokes; immediate delivery from stock of all models; cash or exchange.—Colmore the Agents, Calthorpe the motor cycle, 261, Deansgate, Manchester. [0815]

**C**ALTHORPE-J.A.P.'s, with Enfield gears, actually in stock; £37/16; deferred payments by arrangement.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7325]

**C**ALTHORPE latest 1916 2-speed models in stock; cash or exchange; no waiting. Also a few brand new 1915 models, slightly soiled, at reduced prices.—Eagles and Co., High St., Acton. [X2724]

**C**ALTHORPE-J.A.P., 2¼hp., 1915, condition as new, T.T. bars, Enfield 2-speed gear, lamps, and all accessories, Stewart speedometer; £20, no offers.—Apply after 6 p.m., 173, Earl's Court Rd. [7259]

**C**ALTHORPE Lightweight, 2¼hp., brand new, Mosely tyres, Amac carburettor, handle-bar controlled ignition, aluminium footboards; £28/16, or £2/10 month.—Juno Showrooms, 248, Bishopsgate, London. [7469]

**C**ALTHORPE, new 1916 models, 2¼hp. J.A.P. engine, 2-speed Enfield gear, £37/16; 2-stroke models, 2-speed, £28/17/6; 2¼hp. single speed models, £32; also the sidecar combination, fitted with twin-cyl. 4-5 h.p. J.A.P. engine, 2-speed gear, handsome light coachbuilt sidecar, the combination 37 gns.; exchanges or easy terms arranged.—Wauchopes, 9, Shoe Lane, London. [7449]

## Camplon.

**C**AMPION-J.A.P., 6hp., 1914-15, equal new, but incomplete; must sell immediately; £18/10.—Speechley, 45, Church Rd., Acton. [7551]

**C**AMPION-J.A.P., 6hp., Jardine 3-speed, chain drive, cane 3-seat family sidecar, 3 Lucas lamp sets and horn, muffs, College shield, new tyres, spares, 7,500 miles, splendid order, go anywhere; cost £90, take £45; purchased car.—Liquorish, Evington Valley Rd., Leicester. [X2736]

## Centaur.

**3½**hp. Centaur, very low and fast, mag., etc., £11; 32 good wicker sidecar to fit same, 50/.—Smith, 199b, King St., Hammersmith. [7276]

**3½**hp. 1913 Centaur Motor Cycle and Sidecar, 3-speed and clutch, head lamp, etc., all complete, and ready for tour; a real bargain, £30 spot.—Ferndale, Enmore Rd., S. Norwood. [7370]

## Chater-Fafnir.

**C**HATER-FAFNIR, 3¼hp., mag., in splendid condition and running order, tyres and belt practically new; £14.—14, Dodbrooke Rd., West Norwood. [7510]

## Chater-Jap.

**C**HATER-J.A.P., 4hp. Combination, Jardine 2-speed countershaft, only done 600 miles; £45, bargain; owner enlisted.—Seen 30, Canterbury Rd., West Kilburn. [7344]

## Chater-Lea.

**8**hp. Chater-Lea, coach sidecar; trial given; £26; after 8.—180, Clapham Park Rd. [7532]



## MOTOR CYCLES FOR SALE.

## Chater-Lea.

CHATER-LEA 1915 8hp. Combination, fine condition, all accessories: £50.—24, Rolfe Rd., Charlton, S.E. [7342]

1913 6hp. Twin 2-speed F.E. Chater-Lea, all grey, coachbuilt sidecar, new back tyre and inner tube, Jones speedometer, mirror, large horn, B. and B. Bosch, F.R.S. head lamp, plating as new, engine just re-bushed. Whistle belt: £36/10.—52, Huxley Rd., Edmonton, London. [7308]

## Chater-Werner.

3hp. Chater-Werner, low, perfect, requires battery: £5. or exchange.—65, Campbourne Rd., Hornsey. [7368]

## Clyno.

CYLYNO Coachbuilt Combination, 2-speed, lamps, horn, wind screen, in fine order.—Richardson, Parade View, Dawlish. [X2800]

CYLYNO, 1914, 6hp., 3-speeds, clutch, and starter, detachable wheels, £35.—P. J. Evans, John Bright St., Birmingham. [X2704]

1914 Clyno Combination, 6hp., 3-speed, detachable wheels, spare wheel, all accessories, excellent condition: £65.—Sharp, Hurst Farm, Milford, Surrey. [7336]

CYLYNO 5-6hp. 1915 Combination, military model, and colour, spare wheel, screen, tools, spares, etc., Palmer tyres, little used: £70.—Davis, Ballymore, Love Lane, Pluner. [7313]

CYLYNO 1912 6hp. Combination, overhauled January, Binks carburetter, lamps, and speedometer: seen by appointment after 5.30 p.m.: bargain, £37/10.—Rice, 29, Waldeck Rd., Laton, Beds. [7359]

CYLYNO 5-6hp. Combination, 2-speed, kick start, hood, wind screen, 2 P. and H. lamps, tail lamp, horn, luggage grid, 2 spare tyres, spares, newly overhauled: a bargain for quick sale.—No. 562, c/o The Motor Cycle. [X2641]

## Connaught.

CONNAUGHT, T.T. model, latest type, immediate: exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [7298]

CONNAUGHT, 2½hp., 3-speed gear and clutch, splendid lightweight machine, and guaranteed: £26.—Colmore Depot, 31, Colmore Row, Birmingham. [X2623]

CONNAUGHTS in stock for immediate delivery, miniature, standard, and 2-speed models: prices from £28/17/6.—P. J. Evans, John Bright St., Birmingham. [X2705]

CONNAUGHT, 1915½, 2½hp., 2-stroke, 3-speed, clutch, kick starter, lamp, horn, etc., complete, run 300 miles: cost £55, sell £35 cash.—Masseo, 90, Green Gate St., Oldham. [X2799]

## Coventry Eagle.

COVENTRY Eagle 1915 2-stroke: cost £36/15, accept 25 gns.—Troward, 78, High St., Hampstead. Phone: 5392. [7400]

## De Dion.

2½hp. De Dion Motor Cycle, low frame, requires 2 overhauling: £4/10.—169a, Lower Clapton Rd., N.E. [X2721]

## Douglas.

DOUGLAS, single speed: £18.—103, Myddleton Rd., Bowes Park. [7312]

1915 4hp. 3-speed T.T. Douglas, like new: £50.—Wilkin, Hunter's Bar, Sheffield. [X2756]

DOUGLAS, 2½hp., 1914, little used, splendid condition: £36.—Alder, 56c, Patney Hill, S.W. [7549]

DOUGLAS, 1911, sound and reliable machine, cheap: £16.—11, Luna Rd., Thornton Heath, S.E. [7361]

DOUGLAS, 2½hp., splendid gear, and in good order: £15.—Colmore Depot, 31, Colmore Row, Birmingham. [X2622]

DOUGLAS, 2½hp., 2-speed, 1915, service model, only little used: £38.—Apply, H. Faber, 7, Idol Lane, E.C. [7441]

DOUGLAS, 1915½, T.T., 2½hp., all accessories, exceptional condition: £44.—23, Market Place, Kingston, S.W. [7439]

DOUGLAS, 2½hp., 1914½, 2 speeds, new Dunlops, all accessories, capital order: £32.—Stratton, Mount Pleasant, Redditch. [X2798]

DOUGLAS, 1913, 2-speed, footboards, perfect: £27, lowest.—Seen 9 to 6, Duvene, Side door, 312, Kiburn High Rd. [7529]

DOUGLAS, late 1914, 2 speeds, not used for 12 months, new condition: £36, or offer.—W.S., 34, A-hvale Rd., Tooting. [7395]

DOUGLAS, 1911, 2-speed, all in good condition, £16/10; 1911, with new tyres: £13/10. — 455, York Rd., Wandsworth. [7420]

DOUGLAS, 3½hp., late 1914 (Sept.), 2-speed, clutch, kick starter, spares, splendid condition: £38/10.—Hall, Miller, Kugeley, Stafs. [X2778]

DOUGLAS, 8hp., water-cooled engine, with Williamson sidecar, combination in perfect condition: £63.—3, Chatsworth Rd., Clifton, N.E. [7355]

DOUGLAS, new, latest pattern, 2½hp. models for immediate delivery, including War Office, black Douglas—Moffat, Yeovil, Tel.: 50. [5855]

DOUGLAS, late 1914, T.T., 2½hp., 2-speed, adjustable pull-in, not used much, and in first-class condition: £38.—Holland, Ashby-de-la-Zouch. [X2684]

## SECOND-HAND BARGAINS.

ALL GUARANTEED IN GOOD RUNNING ORDER.

## SIDECAR OUTFITS.

REX, 1914, 6hp. de Luxe, 3-speed model, coach-built Sidecar, chain drive, 650x65 tyres, just been overhauled ..... £50

MATCHLESS, 1914, 8hp., M.A.G. engine, 3-sp. countershaft gear, all chain drive, Lucas dynamo lighting outfit, 3 lamps, 650x65 tyres, Watford speedometer, and excellent outfit ..... £78

HARLEY-DAVIDSON, 7-9 hp., 1913, 3-speed, with Coronet Sidecar (coach built), head lamp, electric horn, and full complement of tools ..... £64

J.H., 1915, 6hp., M.A.G. engine, Sturmer-Archer countershaft gear, 3 speeds, chain drive, complete with best quality Canoelet Sidecar, with hood and screen, brand new, but last year's model: list price, £100 .... £82

REX, 1914, 6hp., 2-speed, Model de Luxe, handle starting, twin engine, 650x65 tyres, coach-built Sidecar, just been overhauled, excellent condition and a bargain at ..... £46

TRIUMPH, 3½hp., 1911, 2-speed countershaft gear, chain-cum-belt, complete with wicker Sidecar: cheap at ..... £30

NEW HUDSON, 1914, 6hp., 3-speed, kick start, complete with New Hudson coach-built Sidecar with screen, all accessories ..... £53

TRIUMPH, 1915, 4hp., 3-speed, with coach-built Sidecar, all accessories, including speedometer ..... £52

ZENITH, 1915, 6hp., countershaft, complete with Millford Sidecar ..... £68

NEW HUDSON, 1915, 3½hp., 3-speed countershaft, kick start, coach-built Sidecar, as new ..... £55

## LIGHT CARS, Etc.

G.W.K., 10hp., 4 speeds, 80 mm. tyres, 1914 model, just being repainted ..... £120

MORGAN, 1915, 8hp. G.P. No. 1, water-cooled, disc wheels, hood and screen, large tyres, all lamps, Binks carburetter, very fast ..... £125

FORD, 1913, 20hp., 4 seater, detachable wheels, make a splendid light van ..... £60

SIZAIRE-NAUDIN, 1914, 12-14hp. Compé, C.A.V. large size dynamo outfit, 5 lamps, 5 detachable wheels, just repainted and overhauled, like new ..... £310

CADILLAC, 1914, 20-30hp., 6-speed model, 7-seater, just overhauled, dynamo light and starting, just being repainted, make a very fine hire car ..... £320

G.W.K., 1915, only done 1,000 miles, and like new, detachable wheels, all accessories ..... £150

G.W.K., exactly as above, but just repainted. £153

A.C., 5-6hp., late 1913, hood and screen, lamps, all tyres new, splendid condition ..... £50

MINERVA, 28hp., 1910, 5-seater: £6 6s. tax; just being overhauled ..... —

KNIGHT Junior, 1914, 11hp., sporting body, excellent order ..... £185

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ENFIELD, 1916, 3hp., 2 speeds, Palmer tyres, T.T. bars, mechanical oiling ..... £46

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REX, 1913, 3½hp., clutch model, good tyres, magnets, spring forks ..... £20

DOUGLAS, 1911, 2½hp., 2 speeds, spring forks, Bosch magneto ..... £22

SUN-VILLIERS, 1914, 2-stroke, single speed, spring forks, footrests, stand, and carrier ..... £19

PORTLAND-J.A.P., 1915, 8hp., 3 speeds, B.S.A. gear box, chain drive, T.T. bars ..... £34

TRIUMPH, 1914 (late), original tyres, 3-speed, like new ..... £48

DOUGLAS, 1914, K, £5 worth of accessories, and like new ..... £42

RUBY-J.A.P., 1916, 2½hp., 2-speed, only done 500 miles ..... £36

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DOUGLAS, 2½hp., 1914, new condition, inclusive lamps, tools, free engine: £36, lowest: owner at Front.—Mr. Nurse, Ashdene, March, Cambridgeshire. [X2645]

DOUGLAS, 3½hp., with sidecar, all lamps and tools, perfect condition: £50: first cheque secures; owner called np.—16, Hamilton Rd., Longsight, Manchester. [7272]

COLMORE Depot, Birmingham, Manchester, Leicester, and Liverpool, have in stock complete range of all models Douglas for immediate delivery, also full range of spares. [6800]

1915 Douglas, 2½hp., T.T., 2-speed, with special long exhaust, semi-T.T. bars, very fast, in excellent condition: £42.—Robinson's Garage, Green St., Cambridge. [7492]

DOUGLAS, 1911, 2½hp., fitted with new engine, and overhauled by ankers, the whole in grand condition: £16, or near offer: seen any time.—Redington, 142, St. James's Rd., Croydon. [7371]

1914 Douglas, 2½hp., countershaft model, 2-speed, free engine, Aude carburetter, Clau sidecar with tail pipe, electric horn and lighting set: £37.—John Haddon and Co., Salisbury Sq., Fleet St. E.C. [7253]

LATE 1914 T.T. Douglas, excellent condition, 2 sets mudguards, 5 gn. speedometer, 2 Lucas lamps, horn, chain case, and spare tube in case, complete with spares, and nearly new Palmer tyres: £39.—Box L1, 681, c/o The Motor Cycle. [7554]

DOUGLAS Motor Bicycles.—2½hp. models. We have one or two brand new latest pattern machines in stock for immediate delivery. The number is very limited, and further supplies are almost impossible to obtain. We therefore suggest you order from us at once and obtain instant delivery.—Douglas Specialists, Robinson's Garage, Green St., Cambridge. Telephone: 388. Telegrams: Bicycles. [7486]

## Edmund.

EDMUND, adjustable spring frame motor cycles: price £46/4, early delivery. Some are financed by others, in our case, it is unnecessary: we garage motor cycles for 1/- per week.—Messrs. Green Taxis, Villier St. Garage, Charing Cross, London. [6639]

## Enfield.

ENFIELD, new 1916, 3½hp. M.A.G. engine: £44.—Digby, Mersea, Essex. [7535]

ENFIELD New 1916 6hp. Combination actually in stock: no waiting.—Moss, Wem. [X2808]

ENFIELD, 1914, 2½hp., lamp, horn, perfect: £24.—Metcalfe, 4, Bold Place, Chester. [X2612]

COLMORE Depot, 31, Colmore Row, Birmingham for immediate delivery of Enfields. [6801]

ENFIELD, 2½hp. twin, in good running order: £12/10.—Worsfold, King's Rd., Blandford. [X2670]

1916 2-stroke Enfield, new: what offers? exchanges entertained.—Taylor's Motor Works, Windsor. [X2740]

ENFIELD, 1914, 3hp., 2 speeds, chain drive, almost new: £34.—Warren's, 6, Warren St., London. [7444]

1916 Enfield Combinations actually in stock, latest models.—Celtic Motor Works, East Hill, Walthamstow. [6598]

ENFIELD 6hp. Combination, new, latest 1916 model, actually in stock: price 85 gns.—The Morris Garage, Oxford. [6811]

ENFIELD, 1915, 3hp., new condition, lamps, horn: or exchange 1915 3½hp., 3-speed, good make: H. Rowdon, Lyndhurst. [X2710]

3hp. Enfield, twin-cyl., chain drive, 2-speed, automatic lubrication, perfect order: £28.—Allworth, 12, Manor Park, Lewisham. [7372]

ENFIELD 1916 6hp. Combination, actually in stock: £89/5; exchange entertained.—Eagles and Co., High St., Acton, W. [X2726]

ROYAL Enfield, 2½hp., all-chain drive, splendid order: £22/10, genuine bargain.—Colmore Depot, 31, Colmore Row, Birmingham. [X2618]

1914 6hp. Enfield Combination, speedometer, P. and H. lamps, splendid condition: any severe trial: 60 gns.—280, Camberwell Rd., S.E. [7355]

ROYAL Enfield 6hp. Combination, coachbuilt sidecar, good order: £50, with accessories.—Colmore Depot, 31, Colmore Row, Birmingham. [X2625]

1914 Enfield Combination, coachbuilt, etc., good condition: bargain, £55.—Write, or call after 7 p.m., Clapham, King George St., Greenwich. [X2794]

3hp. Enfield, 1914, 2-speed, free engine, kick starter, complete with lamps, horn, and speedometer, not done 2,000: 32 gns.—Gilpin, Garage, Gildersome. [X2672]

ENFIELD 1915 6hp. Coachbuilt Combination, complete with lamps, horn, etc., excellent condition: £65.—P. J. Evans, John Bright St., Birmingham. [X2701]

1916 Enfield Combination, latest model, Lucas head, tail lamps, generators, horn, little used, splendid condition: £80.—30, Hollyfield Av., Friern Barnet, N. [7375]

ENFIELDS actually in stock for immediate delivery, 6hp. combinations, 3hp. and 2½hp. models, ready to drive away.—P. J. Evans, John Bright St., Birmingham. [X2702]

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Popular LEVIS	£32 0
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1913 MATCHLESS, 3½ h.p., twin, overhead valve, 3-speed	£35 0
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8 h.p. THOR, 2-speed, dynamo lighting set, speedometer, and Sidecar, run 750 miles	£65 0
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ENFIELD 1916 6 h.p. Combination, used for a few miles, Lucas lamp set, horn, speedometer, complete; £70.—Rice and Co., 15-16, Bishopsgate Av., Cannon St., E.C. [9551]

ENFIELD 1913 6 h.p. Combination, overhauled in March last (cost £7/13), new chains throughout, horn, lamp, speedometer; £45.—Watson, 24, Broadfield Rd., Cardiff, London. [X2729]

1915 Royal Enfield 2-stroke Lightweight, 2 speeds, chain drive, Palmer cord tyres hardly worn, lamps, and horn, in perfect condition; £50.—The Premier Motor Co., Aston Rd., Birmingham. [7540]

TRADESMAN'S Rare Chance.—Enfield 6 h.p. 1913 de luxe combination, lamps, horn, speedometer, very fine condition; £45; commercial box, interchangeable, £5 extra; makes very smart turnout.—Bunting, Harrow. [7500]

ENFIELD 6 h.p. Combination, late 1914½, mileage 4,300, lamps, 2 horns, watch, speedometer, car tyres, spare tyre and tube, very full kit spares and tools, perfect condition; genuine bargain, £59.—No. L1,669, c/o Photography and Focus. [7305]

ENFIELD 6 h.p., 889/5 combination, 3 h.p. £52/10; actually here; also 8 h.p. 1916 combination, hood, screen, and all accessories, ridden under 1,000 miles, bargain; deferred terms if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7327]

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EXCELSIOR Late 1914 Coachbuilt Combination, 7 h.p., 2-speed, clutch, kick-starter, all-chain drive, speedometer, electric lamps, screen, lovely condition, small mileage, very fast; £40, must sell.—29, Brigstock Rd., Thornton Heath. [7388]

AMERICAN Excelsior, 1916, 7-9 h.p., 3 speeds, coachbuilt sporting combination, hand and foot clutch, kick-start, dynamo electrically equipped, every conceivable accessory; cost £110, sacrifice £55, or offer.—3, The Mews, Victoria Rd., Clapham, S.W. [7473]

##### Fafnir.

3½ h.p. Fafnir, Bosch, Klaxon horn, lamp, first-class running; £12, or offers; must sell.—Roy, 23, Croham Rd., South Croydon. [7538]

##### F.N.

5 h.p. F.N., and coachbuilt sidecar, spares; £15; exchange 2-stroke.—10, Amity Grove, Raynes Park, Wembley. [X2781]

2½ h.p. 1913 F.N., 2-speed, Bosch, clutch, shaft, faultless; £18.—60, Oakfield Rd., Higham Hill, Walthamstow. [X2696]

F.N., 1914, 5-6 h.p., Bosch, 2 speeds, clutch, dropped frame; cost £68; called up; £33/10.—68, Elmleigh Rd., Wandsworth. [X2727]

1913 F.N., 4-cyl., 2-speed, F.E., lamp, horn, accessories, splendid order; £20, 00 offers.—106, Stafford Rd., Wolverhampton. [X2300]

##### Harley-Davidson.

BRAND New Harley-Davidsons.—See below.

MODEL F. 7-9 h.p., 3-speed; £68.—The Premier Motor Co.

MODEL J. 7-9 h.p., 3-speed, with dynamo electric lighting outfit; £75.—The Premier Motor Co.

THE Above are guaranteed brand new; standard specification and standard equipment.—The Premier Motor Co., Birmingham.

SPECIAL Gloria Sidecars, to match; 19 and 25 gns. You save £17 by purchasing your new combination direct from the recognised H.D. experts. Delivery carriage paid to any address.—The Premier Motor Co., Aston Rd., Birmingham. [7238]

1916 Harley-Davidson Model 16F in stock.—Parker and Son, St. Ives, Hants. [7349]

HARLEY-DAVIDSONS, 1916 models; immediate delivery from stock.—Colmore Depot, 261, Deansgate, Manchester. [6027]

1915 Harley-Davidson, new, complete, electric lighting, and coachbuilt sidecar; £86/15.—Bull, St. Giles' Sq., Northampton. [X2772]

COLMORE Depot, Birmingham, Manchester, Liverpool, Leicester, for immediate delivery of all models of Harley-Davidsons and spare parts. [0802]

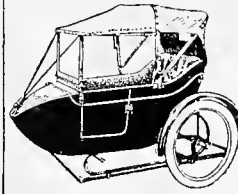
HARLEY-DAVIDSON, late 1915, thoroughly overhauled by makers; £66/10, with sidecar £80.—Colmore Depot, 31, Colmore Row, Birmingham. [X2621]

1915 Harley-Davidson, 7 h.p., electrical equipment, Coronet sidecar to match, speedometer; can be tried any time; £72.—Butterworth, Bushfield House, Milsbridge, Huddersfield. [X2614]

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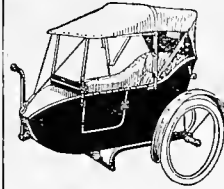


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Hood ..... £2 4  
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1916 6 h.p. J.H. Combination	90 gns.
1916 6 h.p. NEW HUDSON Combination	88 gns.
1916 2½ h.p. NEW HUDSON, 2-sp., 2-stroke	£38 0
1916 2½ h.p. OMEGA-J.A.P., 2-speed	38 gns.
1916 5-6 h.p. British EXCELSIOR, Sturmey countershaft 3-speed gear	68 gns.
1916 4½ h.p. British EXCELSIOR, Sturmey countershaft 3-speed gear	64 gns.
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1916 FORD Chassis, 20 h.p.	£115 0
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1916 20 h.p. FORD Ambulance	£135 0
1915 12 h.p. TRUMBULL Cycle Car, 4-cyl., water-cooled, detachable wheels, all on	£120 0

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3½ h.p. HUMBER, 2 speeds, fine gear	£20 0
4 h.p. BRADBURY, two speeds, and Sidecar	£20 0
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**HARLEY-DAVIDSON**, 7-9h.p., 1916 magneto model, also special Gloria sidcar, full equipment of accessories; £200, demonstration turnout, fully guaranteed; any trial.—Colmore Depot, 31, Colmore Row, Birmingham. [X2624]

**1916** Latest Harley-Davidson, just delivered from works, complete combination, fitted with £21 sidcar, with lighting set and booter; immediate delivery from stock; £105/19 cash; extended payments or exchange.—Wauchope's, 9, Shoe Lane, London. [7450]

**HARLEY-DAVIDSON**, electric model, £89, standard £80/15; delivered from stock; also sidecars to suit; deferred payments to suit individual requirements; also 1915 electric model, with Empress sidcar, £68/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7329]

**HARLEY-DAVIDSON**, the silent grey, 1916 models, immediate delivery from stock, with Gloria, Millford, or Canoelet sidecars; two only 1915 electrically equipped models at pre-Budget price, £76/13. Write or call.—Colmore Depot, 261, Deansgate, Manchester, and 31, Renshaw St., Liverpool. [0817]

**HARLEY-DAVIDSON**, 1916, and handsome coach-built sidcar with apron, 3-speed countershaft gear box, clutch kick starter, electric head and rear lamps, electric horn, Smith speedometer, Goodrich tyres 28x3, used as demonstration model only, and done under 50 miles, absolutely like new price £104, a bargain; deferred payments arranged, 2% only extra.—Wm. Whiteley, Ltd., Queen's Rd., London, W. [7219]

## Hazelwood.

**1914-15** Hazelwood-Jap, 2½h.p., Bosch mag., speeds, clutch, lamps, generator, new tyre and belt, horn, tools, etc., condition and order perfect; bargain, £20.—24, Tudor Gardens, Barnes, S.W. [7496]

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**HENDERSON** Combination, new November, 1915, carefully used by owner only; £80.—H. Wareing, 182, Portland St., Southport. [X2456]

## Hobart.

**1914** Hobart, 2-stroke, single gear, with mag., speedometer, etc.; £15; ready for running.—Till, 65, Eardley Rd., Streatham. [7256]

**HOBART-PRECISION** 2½h.p. Lightweight, 3 speeds, clutch, kick-start, splendid little machine, absolutely like new throughout; bargain, 18 gns.—3, The Mews, Victoria Rd., Clapham, S.W. [7472]

## Humber.

**31**h.p. Humber, 2-speed, with sidcar, and accessories; £17.—169a, Lower Clapton Rd., N.E. [X2722]

**32**h.p. Humber, 2-speed, in good condition, with accessories; £16/10.—169a, Lower Clapton Rd., N.E. [X2719]

**HUMBER** Lightweight, single, good order, 3 speeds, B. and B., Bosch, Hutchinson heavy, speedometer, lamp set; £16, no offers.—T, 32, The Terrace, Gravesend. [7291]

**HUMBER** 1912 3½h.p. Coachbuilt Combination, 2 speeds, clutch, and handle start, good condition; £25, complete.—P. J. Evans, John Bright St., Birmingham. [X2708]

**31**h.p. 1912 Humber, 2-speed, free engine, handle-start, sidcar, Cowey, lamps, horn, spares, recently overhauled, new gears, bearings; £30.—Robertson, 34, Jackson St., Sunderland. [X2804]

## Indian.

**INDIAN**, 1915, 5h.p., 3-speed, kick, accessories; £53 (sidcar if desired).—Barrow, New St., Lancaster. [7280]

**1915** Indian, 5h.p., 3-speed, speedometer, lamps; first offer over £43; joining.—Rutter, Chemist, Sydenham. [7267]

**INDIAN** (4ue), 7h.p., 2-speed clutch, and coachbuilt sidcar, lamps, horn, and spares, all perfect; £42, or near.—Bruce Joiner, Newnham-on-Severn. [X2785]

**7**h.p. Indian, model F, luxurious combination, Powerplus, spring frame, speedometer, 1916, never been ridden; £35.—R. F. Ayscough, Penarth Hotel, Penarth. [X2210]

**INDIAN**, 1914, 7-9h.p., 2 speeds, kick-start, 20 gns. Millford sidcar, electric lighting, horn, 3 lamps, new condition; £55, or offer.—W.S., 34, Ashvale Rd., Tooting. [7396]

**INDIAN** (August, 1915), 7-9h.p., 3-speed, spring frame, electric lights and horn, speedometer, coachbuilt sidcar; cost over £95; many spares; £70.—24, Esplanade Terrace, Jorja, Edinburgh. [X2610]

**INDIAN**, 5-6h.p., 1912, clutch model, and standard coachbuilt sidcar, enamel and plating unscratched, recently thoroughly overhauled, runs and pulls like new; £27.—14, Dodbrooke Rd., West Norwood. [7512]

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**B.S.A.**, 4½h.p., 3-speed, all-chain drive.  
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**BROUGH**, 3½h.p., twin, 3-speed, countershaft gear, Model H.C.  
3½h.p. Twin, 2-speed, Model H, T.T.  
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2½h.p. J.A.P., 2-speed.  
**ENFIELD**, 2-stroke, 2½h.p., 2-speed.  
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6 h.p. Coach-built Combination.  
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4½h.p., 3-sp., and James canoet Sidcar.  
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2½h.p., 2 speeds, and clutch.

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**CANOET**, coach-built ..... from 12 gns.  
**GOLETA**, coach-built ..... 10 gns.  
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**CLYNO**, 1914, 6 h.p. Combination, Lucas electric lighting set, speedometer, etc. £68  
**INDIAN**, 7 h.p., T.T., clutch model ..... £36  
**DOUGLAS**, 1915, 2½h.p., 3 speeds, lamps, horns, speedometer, etc. .... £45  
**BAT-J.A.P.**, 1914, 5 h.p., T.T. model, overhead valves ..... £35  
**BRADBURY**, 1912, 3½h.p., 2-speed, all accessories and cane canoe Sidcar ..... £25  
**O.K.**, 1916, 2½h.p., 2-stroke, 2 speeds ..... £30  
**MATCHLESS**, 1914, 8 h.p., 2-speed countershaft gear, all accessories ..... £40  
**ENFIELD**, 1915, 3 h.p., lamps and horn  
**NEW IMPERIAL**, 1916, 2½h.p. J.A.P., 2 speeds, clutch, and kick starter ..... £38  
**DOUGLAS**, 1913, 2½h.p., 2 speeds and kick starter, lamps, horn, and speedometer ..... £34  
**ROYAL ENFIELD**, 1915, 6 h.p. Combination, all accessories ..... £65  
**ZENITH**, 1913, 3½h.p., clutch model with Gradua gear, speedometer, head lamp, back lamp, and horn ..... £36  
**JAMES**, 1915, 2½h.p., 2 stroke, 2 speeds, Lucas lamp set, rear lamp, and horn ..... £33  
**DOUGLAS**, 1912, 2½h.p., 2 speeds and clutch ..... £25  
**DOUGLAS**, 1914, 2½h.p., 2 speeds, head light, and tail lamp ..... £36  
**ALLOM**, 1915, 2½h.p., 2-stroke, 2-speed ..... £31  
**CALTHORPE MINOR**, 1914, 2 h.p., 2-sp. CALTHORPE-J.A.P., 1915, 2½h.p., 2 speeds, head lamp, back lamp, and horn ..... £30  
**ARIEL** Coach-built Combination, 1916, 3½h.p., 3-speed countershaft gear and clutch, Watford speedometer, Lucas head light, back lamp and horn, wind screen, and luggage carrier on Sidcar ..... £68  
**NEW HUDSON** Coach-built Combination, 1915, 6 h.p., 3-speed countershaft gear and clutch, Lucas head light, rear lamp, and horn, and luggage grid on Sidcar ..... £65

DEFERRED PAYMENTS ACCEPTED FOR EITHER NEW OR SECOND-HAND GOODS.

## EASTERN GARAGE Co.,

Official Repairers to  
R.A.C., A.C.U., A.A. & M.U.,

418, Romford Road, Forest Gate, E.

Telephone—40, East Ham.

Telegrams—Egaraco, London.

## MOTOR CYCLES FOR SALE.

## Indian.

**1915** 7h.p. 3-speed Indian and Sidcar, perfect condition; £50.—Wilkin, Hunter's Bar, Sheffield. [X2755]

**A** REAL Snip.—Ideal combination, twin Indian, spring frame, 2 speeds, clutch, kick starter, 28x3 tyres, electric and gas lamps, horn, also £20 coachbuilt submarine sidcar, electric front and tail lamps, electric horn, aprons, spares; first £50 secures.—Brown, Gloucester Rd., Chesterfield. [X2744]

**INDIANS** in Stock.—Latest models, Powerplus combinations, sporting Powerplus 3 speeds models, standard 7h.p. overhead inlet combinations, with lighting set, the handsome 5h.p. 3-speed double-purpose mount, and 7-9h.p. clutch model road racer.—P. J. Evans, John Bright St., Birmingham. [X2699]

## Ivy.

**IVY-PRECISION** 4½h.p. Twin, Sturmer-Archer 3-speed hub, kick starter, lamps, horn, tools, etc., used only Sundays and Wednesdays when fine, economical, 80 m.p.g., good condition; £33.—Collins, 44, Kingston Rd., Portsmouth. [X2551]

## James.

**1913** James and Sidcar; £39, complete.—Cross, Agent, Rotherham. [X2732]

**JAMES** No. 6 Combinations in stock; no waiting.—Colmore Depot, 261, Deansgate, Manchester. [6026]

**COLMORE** Depot, 261, Deansgate, Manchester, have in stock complete range of James motor cycles. [6033]

**JAMES**, 4½h.p., 3-speed countershaft, cane sidcar, fine order; £42.—Collyer, 286, High Rd., Wood Green. [7314]

**JAMES**, 2-stroke, 2-speed, new lamp set, done 250, absolutely perfect; £32/10.—Cooper, Chemist, Halesowen. [7270]

**JAMES**, 2-stroke, September, 1915, practically new.—Write, Davis, 73, Esmond Rd., Bedford Park, London, W. [7224]

**JAMES** Late 1915 Combination, 4½h.p., fully equipped, in perfect order, spares, accessories; gift, £56.—Fisher, 94, Talbot Rd., East Ham. [7528]

**1915** 4½h.p. James Combination, ridden 800 miles; £68/10, war bargain; generous deferred payments if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7324]

**JAMES** 1916 3½h.p. Twin, 3-speed countershaft, h.b.c. clutch, kick start, Binks carburettor, Palmer cord tyres, T.T. bars, complete with Lucas head lamp, rear lamp, and Lucas horn; cost with accessories over £72; not run 200 miles, guaranteed perfect, and practically as new; will accept £63, T.P. machine considered in part payment.—Norton, Triumph, Douglas, or similar preferred.—Varty, Thundersley, Essex. [7360]

## J.A.P.

**4**h.p. J.A.P. and Sidcar, new 3-speed Armstrong gear, recently overhauled; £22/10.—Apply, Salsicte Tyres, 76, York St., Westminster. [7317]

**3**h.p. Twin J.A.P., Amac carburettor, Druid spring 32 forks, Roc 2-speed gear, handle start; any trial; £20.—Motor Exchange, 24, The Parade, Tooting, S.W. [7560]

## J.H.

**J.H.**, 3½h.p. twin M.A.G. engine, 3-speed gear box; immediate.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [7297]

## Juno.

**JUNO**, V.T.S., 2½h.p., 2-stroke, 1916 model, nearly new Dunlop tyres and belt, Brooks saddle, semi-automatic lubrication, aluminium footboards; price cash £26, or 12 monthly payments of 47/8.—Juno Showrooms, 248, Bishopsgate, London. [7470]

## Kerry.

**KERRY**, 3½h.p., dry cell ignition, new Dunlop belt, Senspray, head and rear light, seat low, good running order, fast; £6, or near offer.—Marchetti, 9a, Whitchee Place, Rochester Rd., Camden Rd., N.W. [7548]

## Lea-Francis.

**LEA-FRANCIS**, 1914, nearly new oversize tyres, in first-class running order, unused since autumn, owner on active service. Lieut. Hunter-Smith, c/o 31a, Broomfield Rd., Chelmsford. [X2662]

**LEA-FRANCIS**, 1914½, twin, 2-speed, mileage 1,440, Lucas lamps (unused), electric light fitted, Watford speedometer, new tyre, enamel unscratched, guaranteed 24-hour throughout; £50.—Kirk, Electricity Works, Birkdale, Southport. [X2760]

## Levis.

**LEVIS** Popular, 1915, new condition; £24.—Thurshy, 53, Grand Parade, Haringay. [7485]

**2**h.p. Levis, 1914, new tyres, Bosch, Amac; £15.—14 Lynton, Stockton Rd., Guildford. [X2594]

**1915** 2½h.p. Popular Levis, lamps and horn; £24.—Wilkin, Hunter's Bar, Sheffield. [X2757]

**LEVIS** Popular, 1914½, horn, original belt, tyres, £17/10.—Rundle, Cardinham, Cornwall. [X2784]

**LEVIS**, 2½h.p., 1915, just overhauled, splendid order; £22/10.—Potts, Barnards Green, Malvern. [X2786]

**2-SPEED** Countershaft Levis, perfect; 26 gns.—Troward, 78, High St., Hampstead. [7403]

We can supply  
FROM STOCK

also SIDECARS  
and CHASSIS.

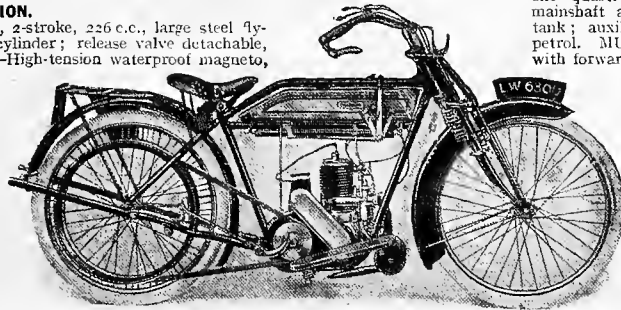
# VINDEC

## MOTOR BICYCLES.

### The "VINDEC" 2½ h.p. Two-speed Two-stroke Lightweight Model.

#### SPECIFICATION.

ENGINE—"Vindec," 2½ h.p., 61×70 mm., 2-stroke, 226 c.c., large steel fly-wheel; transfer port cast integrally with cylinder; release valve detachable, with auxiliary exhaust pipe. IGNITION—High-tension waterproof magneto, chain driven, in dustproof aluminium case. CARBURETTER—Amac. GEAR—2-speed, operated by dog clutch on countershaft; direct drive on both speeds, with simple adjustment for chains; ratio, 5½ to 1. FRAME—Loop type, very low saddle position; long wheelbase. SPRING FORKS—Girder type, Druid licence. BRAKES—Front rim brake, hand applied; rear belt rim brake, heel applied. TRANSMISSION—Chain drive (Hans Renold heavy, ½ in.×½ in.) from engine to countershaft; belt drive from 5½ in. pulley on countershaft to back wheel by ½ in. Dunlop.



CHAIN CASES—Pressed steel, enclosing entirely all chain transmission. WHEELS—26×2 in., N.P., heavy gauge, rims centred and lined. TYRES—26×2 in. Dunlop motor cycle. TANK—Strong tinned steel, with one longitudinal seam; large filler caps. Capacity: petrol, 1 gallon; oil, one quart. LUBRICATION—Direct forced feed to main shaft and big end bearing from hand pump to tank; auxiliary cylinder lubrication by oil mixed with petrol. MUDGUARDS—Front valanced whole length, with forward extension; rear wide section, with extension over belt rim. CARRIER—Strong tubular. REAR STAND—Fixed to back forks, independent of wheel spindle. SADDLE—Pan seat. FOOTBOARDS—Anti-vibratory. TOOLS—Complete set of special spanners, adjustable spanners, screw-driver, pliers, etc., in tool roll; celluloid inflator. FINISH—Black enamel, wheels plated, and enamelled black centres and red lined; tank, dark grey, with light grey panel and black and gold lines. Weight, 150 lb.

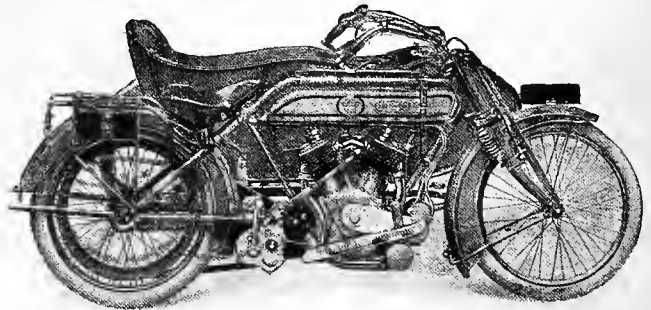
PRICE **38** GUINEAS.

*Write for the "Book of the Vindec."*

### The "VINDEC" 6 h.p. Motor Cycle and Sidecar Combination.

#### SPECIFICATION.

ENGINE—6 h.p. twin-cylinder J.A.P., side by side valves; patent forced lubrication, and internal exhaust lifter; 76×85 mm., 770 c.c. MAGNETO—Splitdorf, adjustable, handle-bar control. CARBURETTER—Latest model Amac. LUBRICATION—Best & Lloyd, semi-automatic, sight feed. GEAR—Sturmey-Archer 3-speed countershaft, clutch, hand-controlled; exceedingly efficient kick starter. TRANSMISSION—Renold's chain, and rim. Dunlop belt over large pulley. FRAME—Built with reinforced tubes, extremely strong head design. FRONT FORKS—Druid, heavy pattern. TANK—Tinned steel, with one longitudinal seam; large filler caps, with bayonet fastening. CHAIN COVER—Steel, designed to eliminate noise and rattle. MUDGUARDS—Special wide, with extra deep valances. STANDS—Front and rear tubular, independent of wheel spindles. CARRIER—Strong tubular, with two armoured pannier bags. TYRES—26×2½ in. Dunlop heavy (also on sidecar). SADDLE—Brooks' B170 pan seat. TOOL KIT—Comprising all tools necessary for ordinary adjustment. FOOTBOARDS—Distinctive solid aluminium, shaped to suit foot. FINISH—French grey, and lined red; sidecar painted and picked out to match.



PRICE **88** GUINEAS.

SIDECAR: CHASSIS—Scientifically designed to incorporate lightness and grace with strength; 4-point connections; quick-detachable fittings. WHEEL—Extra wide, heavy hub; fitted with Dunlop 26×2½ in. tyre. BODY—Panelled wood with solid-built back, luxuriously upholstered spring back, ample seating room; tool locker under seat and pockets in upholstery, with waterproof apron.

Head Offices:  
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STREET,  
LONDON,  
E.C.

Australian Showrooms.  
328, Flinders Street,  
MELBOURNE.

TRADE MARK

# BROWN BROTHERS LIMITED

*The Largest Motor Accessories House in the World*

Northern Depot:  
DEANS GATE,  
MANCHESTER.

And at PARIS.

South Africa:  
Representative:  
E. G. HIGGINSON,  
P.O. Box  
1269 Johannesburg.



# WHITELEYS

will supply any make of **MOTOR CYCLE** by **EASY PAYMENTS**.  
2 per cent. only is added to list prices for a year's credit. Should you select a Calthorpe two-stroke, two-speed (cash price 31 guineas), you pay 13/- extra only. The machine is delivered after payment of £6. 4s., to be followed by 12 monthly payments of £2. 5s.  
**WE HAVE THE BEST ASSORTED STOCK OF MOTOR CYCLES IN GREAT BRITAIN.**

New machines arrive from the works daily. It is therefore impossible for us to give a complete list. Among the machines in our Showrooms are the following:—

## SOLO MACHINES.

	£	s.	d.
7-9h.p. 16J 1916 HARLEY-DAVIDSON, dynamo electric lighting set	89	0	0
4-5h.p. ZENITH, clutch, Model D	73	18	0
4 h.p. No. 6 JAMES, 3-speed	66	5	0
2 h.p. N.U.T., twin, T.T. (late 1915, new)	65	0	0
2 h.p. ALLON, 2-stroke, 2-speed	42	0	0
2 h.p. CALTHORPE-J.A.P., 2-speed, variable ignition	37	16	0
2 h.p. ROYAL RUBY, 2-stroke	29	10	0
2 h.p. ROYAL RUBY, 2-stroke, 2-speed	36	10	0
2-3 h.p. WOLF, Model "A," 2-speed	33	10	0
2 h.p. CALTHORPE, 2-stroke (late 1915, new)	26	0	0
2 h.p. NEW IMPERIAL, 2-speed, variable ignition	37	18	0
2 h.p. HOBART, 2-stroke, 2-speed	37	16	0
2 h.p. LEVIS, latest model	32	0	0
2 h.p. ALLON, 2-stroke	36	0	0
2 h.p. O.K., 2-stroke	25	10	0
2 h.p. TYLER, 2-stroke, 2-speed	33	10	0

West End Agents for the famous JAMES Motor Cycles.

Sole London Agents for the IXION MOTOR CYCLES.

**WM. WHITELEY, LTD.,**

## SOLO MACHINES (continued).

	£	s.	d.
2½ h.p. IXION, 2-stroke	28	10	0
2½ h.p. IXION, 2-stroke, 2-speed	35	10	0

## COMBINATIONS.

7-9h.p. 16F HARLEY-DAVIDSON, special H.-D. Sc.	110	0	0
4½ h.p. JAMES Combination	80	15	0
6 h.p. ENFIELD Combination	89	5	0
4½ h.p. QUADRANT with B.S.A. 3-sp. countershaft gear, Canoelet Sidecar	72	10	0
4 h.p. CALTHORPE-J.A.P. Twin Lightweight Combination, Enfield 2-speed gear, handle starter	70	7	0
4½ h.p. JAMES Combination, with Lucas dynamo lighting and electric horn	93	16	6

## A few Bargains In Second-hand

### Machines and Combinations.

**THE BIGGEST STOCK—THE BEST BARGAINS.**  
 Packing Free. : : Carriage Paid to any address in the U.K.

**T.D.C. DE LUXE MOTOR CYCLES, INDIANS, B.S.A., and ROVERS,** by deferred payments on special terms, particulars on application.

**QUEEN'S ROAD, LONDON, W.**  
 Telephone—Park One. Telegrams—"Whiteley, London."

# MIDLAND

## MOTOR CYCLE TYRES.

## WHY IS IT

that you should insist on buying **MIDLANDS** when buying Motor Cycle Tyres?

Because "Midlands" are the last word in Motor Cycle Tyres. They are the result of years of investigation and practical experience. The product of manufacturers whose experts are not merely rubber and tyre experts but practical motor cyclists and that says a lot. Nevertheless the price is no more than you would pay for tyres of other makers.

## THE MIDLAND RUBBER COMPANY, LTD.

HEAD OFFICE and WKS.: RYLAND ST., BIRMINGHAM.  
 LONDON DEPOT: 31-34, Eagle Street, Southampton Row, W.C.  
 Coventry Depot: Priory Works, New Buildings, Glasgow  
 Depot: 451, Eglinton Street, Dublin Depot: 12, Gt. Brunswick Street, Cardiff Depot: Plymouth Street, Milan Depot: Via Sutorio 6, Amsterdam Depot: 50, Lange Leidsche Dwaars Straat





## "There's a good Time Coming!"

**Prepare for it NOW**

**T**HE Bradbury Factory, from the very early days of the war, has been utilised to its utmost capacity in meeting the demands of the Government, with the consequence that we have not been able to keep pace with the requirements of our numerous Motor Cycle customers.

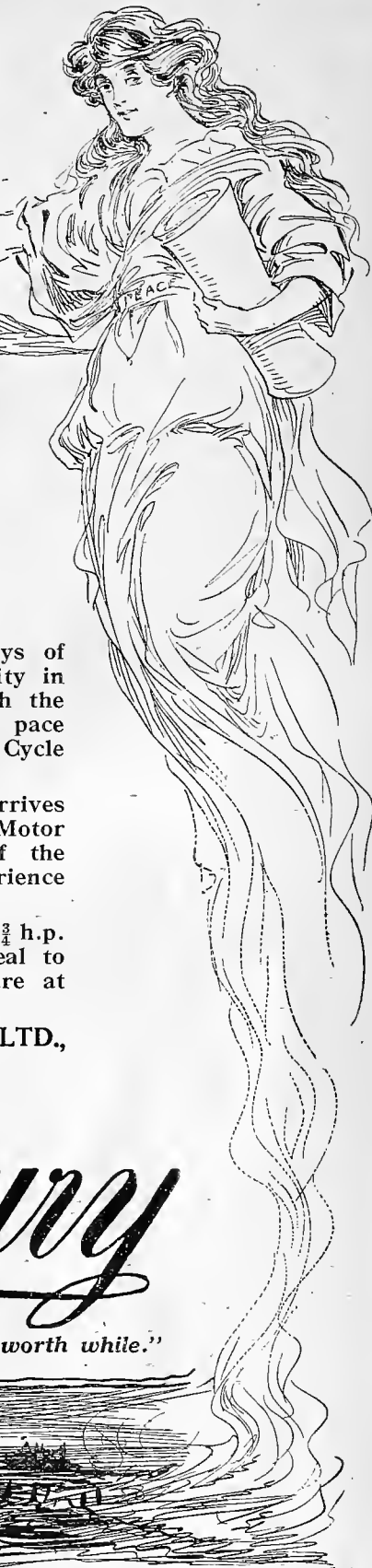
But "there's a good time coming," and when that time arrives many improvements will be embodied in the Bradbury Motor Cycles and their efficiency further enhanced because of the extensive experience we are gaining to-day. That experience will be at your disposal.

The new Bradbury Models—and particularly our new 2 $\frac{3}{4}$  h.p. Lightweight Model—will, we feel confident, strongly appeal to you. It will pay you to wait until these new Models are at your service. They will be found well worth waiting for.

**BRADBURY & CO., LTD.,**  
Wellington Works,  
OLDHAM.

# The Bradbury

*"The machine that makes waiting worth while."*



# *The BRITISH* "EXCELSIOR"



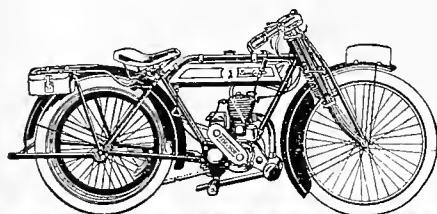
## The Most Economical

**T**HE most economical means of travel is the Motor Cycle. The most economical motor cycle is the British "Excelsior," because, being strongly built with a good sound engine, it lives long. It runs smoothly—wear and tear being the least possible. There is always an ample reserve of power. British "Excelsiors" are built for long service—and to give that service at the lowest cost. You may pay more for a motor cycle, but you cannot buy better value; you may pay less, but you may not save money—in the long run.

THERE is a British "Excelsior" to suit everybody — six models from 2½ h.p. to 8 h.p. The 2½ h.p. is ideal for either town or touring. Easy to control, inexpensive to buy and maintain, Early delivery.

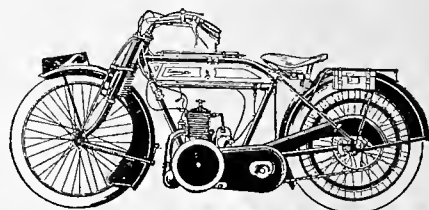
Price:

**£30 : 16s.**

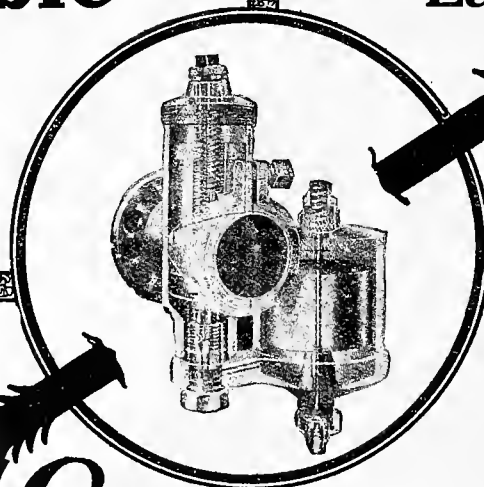


Complete details from  
**Bayliss, Thomas & Co.**  
Excelsior Works,  
**Coventry.**

Founded 1874.  
Sole London Agents: H. TAYLOR & CO.,  
Store Street, W.C.



## Inseparable



**Cool Running.**  
**Easy Starting.**  
**Low Petrol Consumption.**  
**Great Flexibility.**  
**Plenty of Power on Hills.**

*The*  
**AMAC**  
**CARBURETTER**

Write for Catalogue.

**Aston Motor Accessories Co., Ltd.**  
Aston Cross, Birmingham.



## The ROYAL ENFIELD Way Pays Best.

Royal Enfields are doing good service in the business world to-day. Under ordinary conditions, with loads averaging from 2 cwt. to 3 cwt., there is no more advantageous way of delivering goods than by means of a Royal Enfield Sidecar Combination.

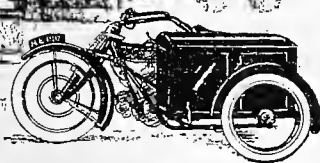
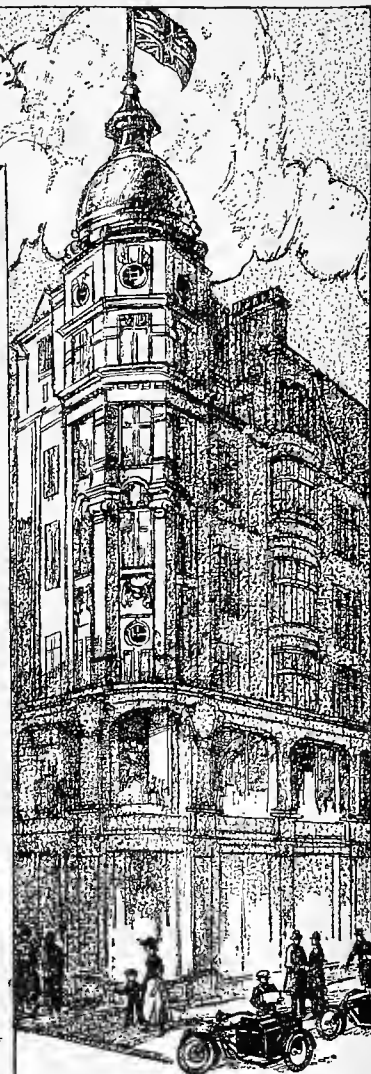
The all-chain driven Royal Enfield is specially suitable for this class of work. It is reliable to the highest degree, and its economy in petrol consumption and running costs is remarkable. Recent tests carried out with a Royal Enfield at Brooklands by "The Motor Cycle" gave an average of 76 miles to the gallon.

We can quote actual instances of where Royal Enfield Models are carrying goods of all descriptions—differing as widely as butcher's meat and builder's materials—and doing it day after day without trouble. We shall be pleased to send our catalogue, with full particulars of this model, on request. Mention "The Motor Cycle" when writing.

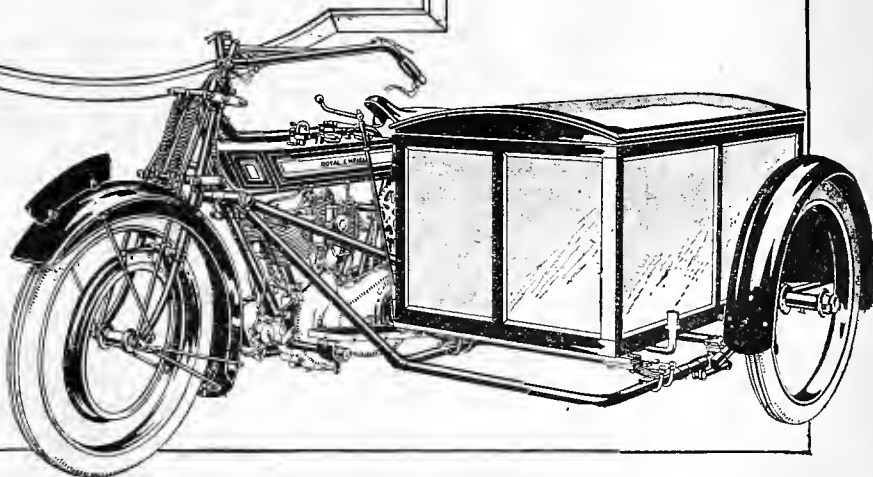
**The ENFIELD CYCLE CO., LTD., REDDITCH.**

London Office and Showrooms:

**48, Holborn Viaduct, E.C.**



*"Made like a Gun"*



*In answering this advertisement it is desirable to mention "The Motor Cycle."*





## Have you ordered your JAMES?

It will very considerably tend to lessen the waiting period if you make up your mind and order your JAMES immediately—because—

Although we are still working at high pressure on War Supplies a certain number of our machines are available from time to time and, of course, we uniformly observe the time-honoured plan of "First come, first served."

*Call at once on our Agent for the purpose of Inspection.*

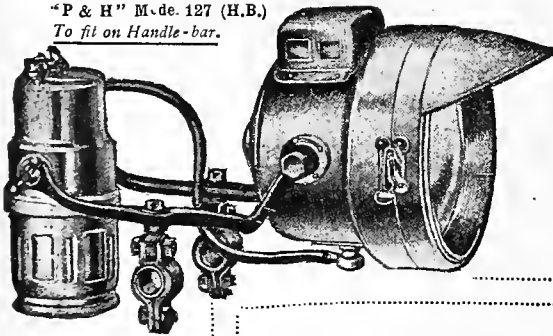
**The JAMES CYCLE Co., Ltd., GREET, BIRMINGHAM.**

LONDON DEPOT: 22, HOLBORN VIADUCT, E.C.

BIRMINGHAM: BROAD STREET CORNER.

R.H.S.

"P & H" M.de. 127 (H.B.)  
To fit on Handle-bar.



LAMP SELECTION is simplified for the rider who wisely chooses from the 'P & H' range — long since approved by experienced riders

Simplified, because "P & H" Reliability dates back 30 years—a Reliability since added to by the cumulative efforts of the most expert lamp designers.

Every contingency likely to arise on the road has been anticipated and fully provided for—hence the wide reputation of the "P & H" Lamps for Reliability.

Ask any "P & H" user—he knows! May we send you copy of our Art Catalogue fully describing.

**POWELL & HANMER, Ltd., Chester St., BIRMINGHAM.**

# — The RELIABLE Lamps

# HARLEY- DAVIDSON COMMERCIAL CARRIERS

ARE IDEAL FOR ALL BUSINESS PURPOSES

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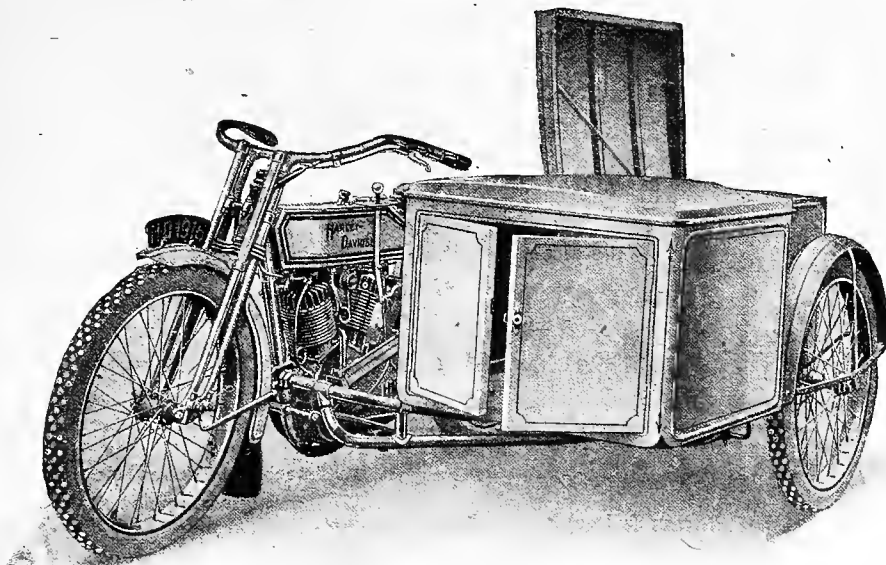
**Economical      Reliable**  
**Speedy              Attractive**

They form the finest Advertisement and  
Business Aid that any trader could utilize.

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INCREASE YOUR TRADE

DECREASE YOUR COSTS



WRITE TO-DAY FOR LEAFLET "C.C."

**HARLEY-DAVIDSON MOTOR COMPANY, LIMITED**  
**74 NEWMAN STREET. OXFORD STREET. LONDON, W**

*In answering this advertisement it is desirable to mention "The Motor Cycle."*

## The Merit of the A.J.S.

"Merit" secured that well-remembered win—First, Second, Fourth and Sixth—in the 1914 Junior T.T. Race, and "Merit" to-day still keeps the A.J.S. supreme! Mark this list of silent "merit-makers"—just a few from the comprehensive make-up of A.J.S. refinements:—

Interchangeable Detachable Wheels, with undisturbed Speedometer Drive; Rear, Front, Spare and Sidecar Wheels all Interchangeable; All-enclosed Weatherproof Chain Transmission; Three-speed Countershaft Gear; Handlebar-controlled Clutch; All-enclosed Foot-starter; Scientific "Straight Tube" Frame; Vertical and Horizontal Action Spring Forks; Special Protective Mudguards (enclosing Fork), and Weatherproof Finish.

—think of the service it suggests and then for outside Confirmation of A.J.S. worth first "ask the man who owns one."

**A. J. Stevens & Co. (1914), Ltd., WOLVERHAMPTON**

**STILL "WIN MAKING."**—Latest Records: Midland Easter Trial—GOLD MEDAL and FIRST-CLASS Certificate, Public Schools Championship, Snowhill: FIRST PRIZE (Class 2B). Cork St. Patrick's Day Trial: 4 GOLD MEDALS and Tied for SPECIAL PRIZE.

# A.J.S.

## The INSURANCE POLICY

*that Covers*

**Pillion Riding (with Sidecar attached) and the use of the machine for occasional personal business journeys.**

***Without Extra Premium.***

**Risks Covered:** Unlimited Third Party Claims and all Law Costs — Accidents to the Machine — Fire — Theft — and Transit Risks.

**Premiums:** 3 h.p., £3 - 7 - 6, 4 h.p., £3 - 12 - 6, 5 h.p., £3 - 17 - 6,  
6 h.p., £4 - 0 - 0, 8 h.p., £4 - 5 - 0.

**Including a Free Subscription to "The Motor Cycle" for Twelve Months**

### ENQUIRY FORM

(To be sent to address below).

Make of Machine.	H.P.	Date of Manufacture.	Present Value.	Registered Number.

Will machine be driven solely by owner? .....

Will passenger be carried on luggage carrier or pillion of motor cycle? .....

If so, will sidecar attachment be used? .....

Name .....

Address .....

.....

Fill in this form and send to "THE MOTOR CYCLE" INSURANCE DEPT., HERTFORD STREET, COVENTRY.



HAVE YOU OBTAINED A COPY OF OUR LATEST BOOKLETS ?

"HINTS & TIPS" (which deals mainly with four-strokes).

"ALL ABOUT TWO-STROKES" (which no two-stroke rider can afford to be without).

WE SHALL BE HAPPY TO SEND YOU EITHER OR BOTH POST FREE ON APPLICATION.

BROWN & BARLOW, Ltd., Westwood Road, WITTON, BIRMINGHAM.



## The Originality

which has secured for Sphinx plugs their position of Honour throughout the world also finds expression in the mode of their packing.

The arrangement is such that without breaking the seal which holds the

# SPHINX

plug in the box, the lid may be lifted, revealing a removable card fully descriptive of the type of plug. Thus the obvious merit of sealing is coupled with the equally essential advantage of knowing precisely whether the plug under the seal is the pattern suitable for the purpose in view.

Interesting booklet showing the various types of Sphinx plugs free on request.

## THE SPHINX

Manufacturing Co.,  
Dept. B/G,  
BIRMINGHAM.



**JOHN PIGGOTT'S**

The New Treasury Note Case. Real Leather. Sale Price, 2/4. Initialled Free. Post .. 2d.

**THE "TOURIST" OVERALL SUIT.**  
*For Dust, Rain, and Wind.*  
Made of extra stout double texture Fawn Government Twill. All seams sewn, cemented, and taped. The Jacket is made double-breasted. The Trousers are made in the Seatless Overall Style, with apron front.  
Usual Price, 45/6.  
Sale Price - 39/8  
Trousers only, 18/9  
Jacket only, 22/9  
Leather Belts, 1/6 each.



52 Pages. 52 Pages.

**SEND FOR SPECIAL SALE LIST**

Post Free.

**JOHN PIGGOTT, Ltd.,**  
117 and 118, Cheapside and Milk Street Buildings, London.

The "J. P." 3,000 Mile Motor Cycle Cover.



Write for FREE SECTION.

**YOUR TYRE ACCOUNT:**  
10 Miles for 1d.

GUARANTEED by using our

**ALL-BRITISH Motor Cycle Tyre.**  
The Cover that has stood the test of time. Guaranteed 3,000 miles, with or without Sidcar.

Sale Price .. 25/-  
Sizes stocked, 26 x 2, 26 x 2 1/2, 26 x 2 1/4.

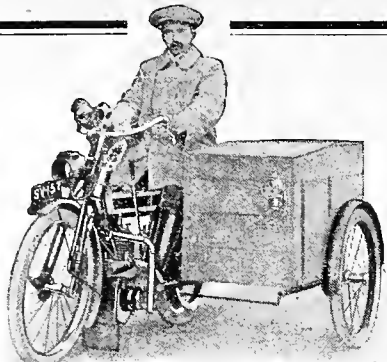
£1 for 15/6.

The "J. P." Wristlet Watch.  
Radium Figures and Hands.  
Usual Price, 20/-  
Sale Price, 15/6

JULY SALE

In answering these advertisements it is desirable to mention "The Motor Cycle."





L.M.C. with Sidecar Delivery Van.

## L.M.C. THE BEST IS L.M.C. REAL ECONOMY.

12,000 Miles in 12 months—NO REPAIRS.

Mr. Thomson, of Milnathort, reports: "Machine working every day for over a year, pulling sidecar delivery van with 2 cwt. of goods in it. Runs over 1,000 miles every month. Am well pleased. Engine never had any repairs."

For Art Catalogue and delivery dates apply:

Any Rudge-Whitworth Depot (Sole Agents)

or Makers:

The Lloyd Motor Engineering Co., Ltd.,

**L.M.C.**

132, Monument Road,  
Birmingham.

**L.M.C.**

# M-L

## Magnetos for Motor Cycles

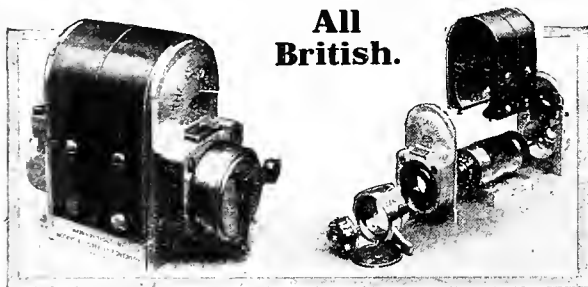
COMPLETE range of types for Lightweights and Standard-single and two-cylinder.

M-L Magnetos always start easily and are reliable and efficient at the highest possible speeds.



After the war our resources will be at the disposal of makers and users of British Motors.

The M.L. Magneto Syndicate, Ltd.,  
Victoria Works, Coventry.

All  
British.



**CAUTION.**  
See that the name 'FOX' is on the metal discs (right and left) attached to every genuine pair of FOX'S New Non-Fray Spiral Puttees, thus—


Patentees & Sole Manufacturers—  
FOX BROS. & Co., Ltd., (Lep. N)  
Wellington, Somerset

## FOX'S

### "F.P." PUTTEES

NEW NON-FRAY  
SPIRAL (Patented)

Agents for United States—  
Manley & Johnson,  
260-266, West Broadway,  
New York, U.S.A.



# Invicta

## TWO STROKE

WE CAN OFFER VERY GOOD DELIVERIES.

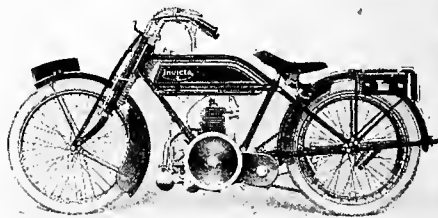
Manufacturers:

**A. BARNETT & Co.,** West Orchard, **COVENTRY**

A beautifully finished 2½ h.p. machine that will take you anywhere. Equally suitable for Home and Export.

**SINGLE-SPEED MODEL: 35 GNS.**

**TWO-SPEED MODEL: 42 GNS.**



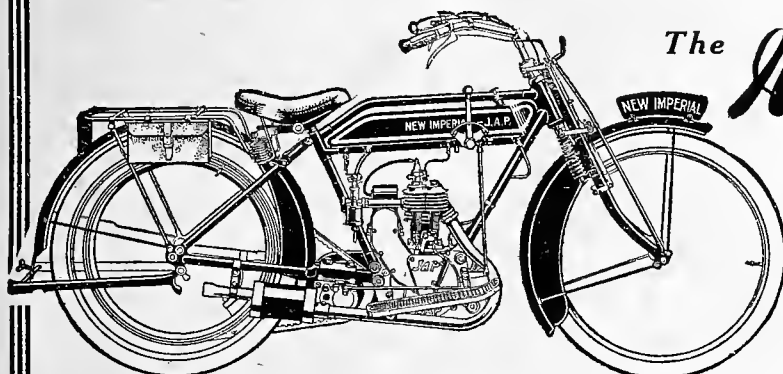
# Genuine Testimony

— is valuable to YOU — read this — which proves high claims made for the  
 “New Imperial Light Tourist” are easily within the actual facts.—

SOUTHSEA, MAY 29TH.

“I thought that you might be interested to know of a splendid run that I have just had on my ‘New Imperial’ 2½, from Southsea to Birmingham — a distance of 146 miles — on 7 pints of petrol, which you will find works out at 167 miles to the gallon. I should think this would constitute a *Record*, and I should be glad to know if you have a better. I may say that I can prove the above statement at any time. I may also add that since riding the machine, which I had new in January, 1915, I have done 4,000 miles, and have not had a single adjustment to the machine. This, coupled with the above petrol consumption, speaks well for the machine as a whole.”

Yours truly, E. C. HENLEY.



The *New Imperial*

is The Machine of  
 Perfect Dependability

Don't take risks—

Insist on a “New Imperial.”

NEW IMPERIAL CYCLES, LIMITED,  
 BIRMINGHAM.

(Estd. 1887).

Booklet, “Don't Take Risks and Why,” sent free on receipt of request.

## The Saddle

is a vitally important part of your motor cycle—upon it depends your degree of comfort and enjoyment a wheel. Then don't experiment—insist on having an

## EMPIRE-DE-LUXE

—the most comfortable and dependable saddle made. Ask your Agent to show you the Empire-de-Luxe models—you'll find one that just meets your need. Write for “The Leatheries” Catalogue, it will aid you in selecting a suitable model.

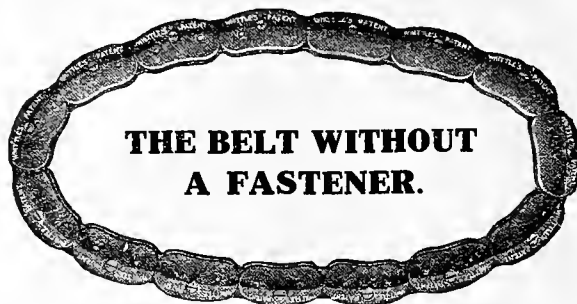
The LEATHERIES, Ltd., Sampson Rd. North, Birmingham.

Model 91.  
 Seat Size  
 13½ × 13½

# THE WHITTLE <sup>PATENT</sup> BELT

THE ECONOMICAL BELT.

FOR MOTOR  
CYCLES OF  
ALL POWERS,  
CYCLE CARS,  
FANS,  
AND DYNAMOS.  
  
CAN BE RUN  
QUITE SLACK.



THE BELT WITHOUT  
A FASTENER.

MANY WHITTLE  
BELTS HAVE  
RUN 20,000  
MILES AS  
TESTIFIED BY  
USERS IN  
ALL PARTS  
OF THE  
WORLD.

LENGTH CAN BE ADJUSTED IN ONE MINUTE.

BOOKLET FREE ON APPLICATION.

**THOS. WHITTLE & SONS, LIMITED,  
WARRINGTON.**

Telegrams:

"Belt, Warrington."

Telephone:  
365.

## AUTO-CYCLE UNION

PROTECTION, ADVICE, INSURANCE, CONVENIENCE, ECONOMY.

*Illustrated Booklet post free on application to—*

Secretary, Auto-Cycle Union, Royal Automobile Club Buildings, Pall Mall, London, S.W.



4 H.P. SINGLE-CYLINDER.  
6 H.P. TWIN-CYLINDER.  
3-speed Countershaft Gear.

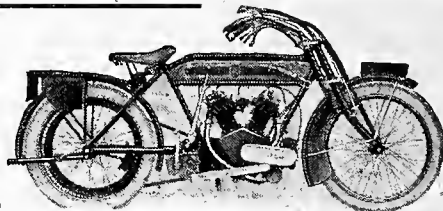
FOR COMMERCIAL WORK, RELIABILITY  
AND STRENGTH ARE ESSENTIAL.

**"OVER-SEAS" MOTOR CYCLES**

are designed to withstand the strains of rough  
Colonial roads.

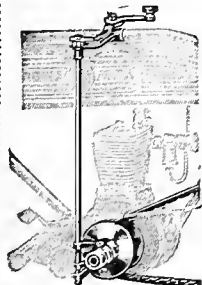
A T CATALOGUE post free from the Makers:

The OVER-SEAS MOTOR Co., Ltd., Johnstone St., Ladywood, Birmingham



## The 'GRADO' MULTI-PULLEY

with FREE ENGINE.



Starts your machine like a car!  
Takes your machine and sidecar up hills  
impossible without!  
Gets you safely through thickest traffic!  
Ensures safety over greasiest roads!  
In fact, it turns work and danger into a pleasure!  
Just half a turn of the handle on top tube  
changes from top gear to free engine.

Price up to 4 h.p. .. £3 3 0

" 6 h.p. .. £3 10 0

10" extra to suit Engines with crank

bosses, like J.A.P., old Rex, etc.

Lightweight Model - - - £2:10:0

Pulleys with new ball thrust bearings: Lightweight,

£3 5s.; up to 4 h.p., £4; up to 6 h.p., £4 10s.

THE GRADO MANUFACTURING CO.,

Pershore Street, Birmingham.

NO MATTER WHAT  
YOUR REQUIRE-  
MENTS IN THE WAY  
... OF ...

## TRANSFERS

For  
Motor Cycles  
and  
Sidecars.

Write to  
**ILIFFE & SONS Ltd.,**  
TRANSFER  
SPECIALISTS, **COVENTRY.**  
London: 20, Tudor Street, E.C.  
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**THE BEST**

**RELIABILITY**  
of the

**RICH**  
**DETACHABLE**  
**Tubes & Covers**

4,500 miles on a RICH Tube without using the pump. This absolutely unsolicited testimonial can be seen with a thousand others, at our office; also hundreds of ends of all other makes—British and Foreign—with the opinion of the riders.

**ON EARTH**

**GUARANTEED AIR-TIGHT, with Free Air Passage.**

**PRICES:**

	24in. or 26in.	28in.
1 1/2 in. ....	8/-	9/-
2 in. ....	11/-	12/-
2 1/2 in. ....	12/-	13/6
3 in. ....	13/-	14/6
3 1/2 in. ....	14/6	16/6
3 in., 650 x 65	20/-	23/-
3 1/2 in. ....	26/-	30/-

PEDAL CYCLE, 26 or 28in., 1 1/2, 1 3/4, 1 1/2, 6/-.

Not sold under the above prices.

Cyclists' own tubes fitted with Detachable Joint. 1 1/2, 2/3; 2, 5/-; 2 1/2, 5/-; 3, 6/-; 3 1/2, 7/-; 3 3/4, 8/-.

Pedal Cycle, 1/6.

Always send size of Cover.

Write for Booklet.

**The Thames Rubber & Leather Co.**  
199, Upper Thames St., London, E.C.

**Testimonial.**  
Gentlemen, Highgate.  
Please send me a Rich Tube. I must mention the one I tried and have in use since 1911 is still acting splendidly, and I am now transferring the present one to the front, and fitting a new one to the back. They are a boon.

**SAVE !  
SAVE !  
SAVE !**

You do not help either the tyres or your pocket when you repair them in such a way that the work has to be done again and again.

**There's no saving there !**

You are not practising economy when, because of the failings of the repair outfit or the rubber solution, you spend hours on a repair which should only take minutes. Time is more than ever, now, money.

**There's no saving there !**

But if, on the other hand, you have always a

**'CHEMICO'**

**RELIANCE  
REPAIR OUTFIT**

AND SOME

**'CHEMICO'  
RUBBER  
SOLUTION**

handy you will be more than surprised at the ease with which tyre repairs can be carried out, and at the permanency of those repairs.

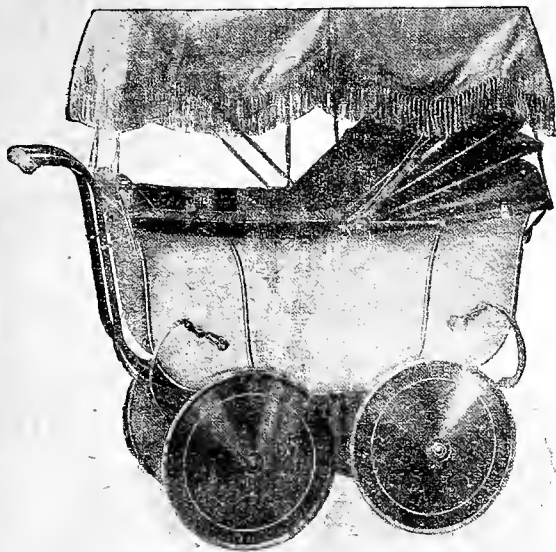
**There's real saving there !**

They WERE first,  
They ARE first,  
They WILL REMAIN first  
for quality and quantity.



Your  
dealer  
stocks  
them

**DUNKLEY PRAMS.**



**DUNKLEYS, LIMITED.**

Established 40 Years.

Manufacturers of Aeroplane Wheels.  
Houndsditch, LONDON, E.C. Jamaica Row, BIRMINGHAM.

In answering these advertisements it is desirable to mention "The Motor Cycle."



# Clyno Utility

## As a Passenger machine

the CLYNO'S supremacy is indisputable. Designed and built as a complete unit—efficient and dependable in the highest degree—it offers a service that is quite exceptional, and well merits its title "THE Sidecar Combination."

## As a Commercial vehicle

the CLYNO has proved of great value. Its marked simplicity, efficiency, and economy are features that have made it essentially THE machine for speedily and economically "delivering the goods."

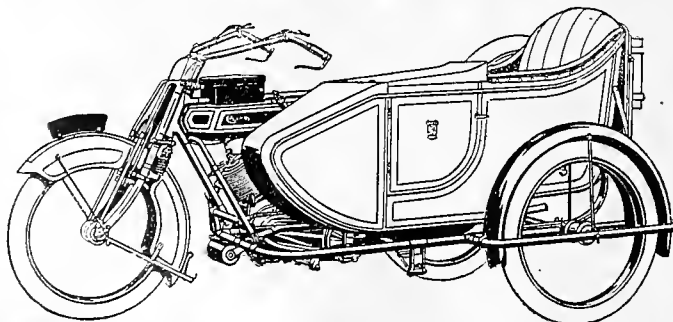
## As a War Service machine

the utility of the CLYNO has been most strikingly demonstrated—it is being utilised for carrying quick-firing guns, for conveying wounded soldiers, for despatch work, and many other Military duties—and its exceptional service has won for it a great reputation as THE Military motor cycle.

To-day our entire output of CLYNOS is required for War Service—but in the future CLYNO supremacy will be greater than ever, and—whether you require a Passenger machine, or Commercial vehicle, you'll find the CLYNO perfectly meets your requirements. Keep the CLYNO in mind.

**CLYNO Engineering Co., Wolverhampton.**

Telegrams: "CLYNO, Wolverhampton."  
Telephone: 992 Wolverhampton.



## MOTOR CYCLES FOR SALE.

## Levis.

**COLMORE** Depots, Birmingham and Leicester, for delivery of all models of Levis motor cycles from stock. [0804]

**LEVIS** 1916 Popular Models from stock: £32 cash, or gradual payments.—Vauchope's, 9, Shoe Lane, London. [7451]

**LEVIS**, 1916, 2½ h.p., shop-soiled only; £33, list price £40, bargain.—Colmore Depot, 31, Colmore Row, Birmingham. [X2617]

**LEVIS**, 1914 (late), 2½ h.p., complete, Lucas accessories, excellent condition; £25.—P. J. Evans, John Bright St., Birmingham. [X2703]

**LEVIS**, 2½ h.p., new, done 400 miles, lamps, horn, cyclometer, etc.; £25, or offer.—35, Palmerston Rd., Forest Gate, Essex. [X2766]

**LEVIS** Popular, new; special bargain; cannot repeat; £28 cash; gradual payments 2%.—Referee Cycle Co., 332, High Holborn. [0764]

**LEVIS** Populars, £32, with Enfield gears £47/10; actually in stock; deferred terms if desired.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7326]

**LEVIS** 2-stroke Motor Cycles, latest 1916 models.—Sole London and district agents. Cars and Motor Sundries Ltd., 175-177, Shaftesbury Av., London, W.C. Phone: 1432 Regent. [0711]

## L.M.C.

**L.M.C.**, absolutely new, 2-speed countershaft gear, chain and belt; £52/10, guaranteed.—Colmore Depot, 31, Colmore Row, Birmingham. [X2616]

## M.A.G.

**M.A.G.**, 1915, 3½ h.p. twin, practically new, enamel and plating unmarked, spring forks, Enfield 2-speed gear, free engine and kick-start, Bosch waterproof; £39.—14, Dodbrooke Rd., West Norwood. [7513]

## Martin.

**MARTIN-J.A.P.**, 2½ h.p., adjustable pulley, forced feed Amac, Bosch, nearly new tyres and belt, lamp and generator, new tools, etc.—Vincent Motor Co., Rugeley, Staffs. [X1760]

**MARTIN-J.A.P.**, latest 1916 models, delivery from stock; single gear £32/10, if fitted with the famous Enfield 2-speed countershaft gear, £37/10.—Sole London and District Agents, Cars and Motor Sundries Ltd., 175-177, Shaftesbury Av., W.M. Tel.: Regent 1432. [0760]

## Matchless.

**MATCHLESS**, 1915, 7-9 h.p. M.A.G., 2 spare tyres; £75.—S., 64, Macoma Rd., Plumstead, S.E. [7295]

**MATCHLESS** 8B Combination, late 1914, 3 lamps, good tyres, splendid condition; £65.—1a, Bloomfield Rd., Plumstead. [7440]

**MATCHLESS** Combination, 7-9 h.p. J.A.P., 2-speed, 1913, speedometer, lamps, spares, competition machine in topping order; £45.—Yuki, Dingwall Gardens, Golder's Green. [7261]

**MATCHLESS**, model 8B, 7 h.p., 3-speed countershaft gear, kick start, 1915 Empress sidcar; £65; part exchanges considered.—"Bramlea," Charlton Rd., Shepperton-on-Thames. [7505]

**MATCHLESS**, 8 h.p., 1913, with 2-seater sidcar, fast, powerful, and allent, practically new, all new tyres May, 1916.—Woollett, 19, Queen's Rd., Peckham. Tel.: 1551 New Cross. [6353]

**MATCHLESS**, 1915, 8 h.p., beautifully fitted up, and in fine order, with Montgomery sidcar; deferred terms if desired; £73/10.—Lamb's, 151, High St., Walthamstow, and 50, High Rd., Wood Green. [7331]

**MATCHLESS** Combination, 7-9 h.p. M.A.O. engine, perfect condition, splendid tyres unpunctured, Stewart speedometer, lamps, etc., outfit looks nearly new; £68, first comer.—6, Lorenzo St., Pentonville Rd., King's Cross. [7504]

**MATCHLESS**, 8 h.p., T.T. model, late 1913, very fast, only run 4,000 miles, variable gear, new Grosvenor streamline sidcar, accessories, guaranteed perfect, appearance as new; £50, no offers.—Mill, 201 Sandfields, Lichfield, Staffs. [X2751]

**MATCHLESS** 8 h.p. Combination, 1913 model, new 1914, 2 generators, 3 lamps, speedometer, accessories, Bluenel screen, tyres as new, many spares, including new Dunlop, complete tools, mileage 3,000; £50.—Cpl. Gibbons, c/o 27, Waterloo Rd., London. [7341]

## Minerva.

**MINERVA**, 2½ h.p., mag., m.o.v., good condition, reliable; £10/10.—Bird, High St., Daventry. [X2768]

**MINERVA** 4½ h.p. Twin, fine condition, new 28x2½ tyres, tubes, belt, T.T. low, fast; bargain; £17.—Riekie, R.N.A.S., Crystal Palace. [X2605]

**MINERVA**, 3½ h.p., 2-speed, kick starter, spring forks, low, excellent condition; bargain; £18, offers.—Graham, 27, Wandale Rd., Upper Tooting. [7495]

**1909** Minerva, 4 h.p., m.o.i.v., variable gear, free engine, new tyres, B. and B., Bosch, smart appearance, very fast; £15, offers.—Canning, 33, Salford Rd., Warwick. [X2829]

## Motosacoche.

**MOTOSACOCHE**, 2½ h.p., new, variable gear, free engine, Druids; 20% off.—46, Hanover St., Islington, N. [7425]



**Sole London and District Agents for -  
A.J.S. & British Excelsiors.**

**Sole District Agents for Calthorpes.**

**Contracting Agents for all other Makes.**

**TERMS: CASH, EXCHANGE, or  
EXTENDED PAYMENTS.**

## NEW MODELS.

6 h.p. A.J.S. Combination .....	£102 18
4 h.p. B.S.A. Combination .....	£80 0
7 h.p. HARLEY-DAVIDSON, electric equipment	£89 0
2½ h.p. 2-str. EXCELSIOR, 2-sp., & clutch	£44 2
Coach-built Sidcar for same .....	£10 10
8 h.p. British EXCELSIOR, 3-speed .....	£78 15
2½ h.p. ALLONS, 2-speed .....	£42 0
4 h.p. CALTHORPE Combination .....	£70 7
6 h.p. ENFIELD Combination .....	£89 5
2½ h.p. CALTHORPE-J.A.P., 2-speed .....	£37 16
2½ h.p. CALTHORPE, 2-stroke, 2-speed .....	£32 11
2½ h.p. lady's CALTHORPE, 2-speed .....	£35 14
ROVER Sidcar .....	£15 15

**Write for Full List of Shop-soiled and Second-hand Bargains ready for Immediate Delivery.**

## SELECTIONS.

	Cash.	De-	And 12
	£ s.	posit.	Pay-
		£ s.	ments of
1915 4 h.p. A.J.S., detach-	46 10	16 10	53/9
able wheels .....			
1915 2½ h.p. EXCELSIOR,	36 10	10 10	44/9
2 speed, and clutch .....			
1915 3½ h.p. T.T. RUDGE	45 0	15 0	53/9
Multi, Isle of Man Mod. .....			
1915 4 h.p. B.S.A., Mod. H.I.	50 0	—	—
1913 6 h.p. A.J.S. and Sc. .....	40 0	—	—
1914 6 h.p. A.J.S. and	70 0	25 0	80/8
Canolet, hood and			
screen .....			
1915 5-6 h.p. HAZLE-	60 0	20 0	71/8
WOOD-J.A.P., 3 speed,			
and Sidcar .....			
1914 8 h.p. ZENITH,	62 0	18 0	78/10
c/shaft, and Sidcar .....			
1915 HARLEY-DAVID-	50 0	—	—
SON, electric equipment .....			
1913 3½ h.p. ARIEL, 3-sp.	40 0	10 0	53/9
and Sidcar .....			
1914 3½ h.p. SUNBEAM,	65 0	25 0	71/8
3-sp., and Sidcar .....			
1914 3½ h.p. SUNBEAM .....	46 10	—	—
1914 8 h.p. BAT and Sc. .....	50 0	15 10	71/8
1915 4½ h.p. EXCELSIOR,	59 0	—	—
soiled only .....			
1915 CALTHORPE-J.A.P.	32 0	10 0	40/-
2-sp., new, cost £36 15s. .....			
1915 3½ h.p. ARIEL and	59 0	19 10	71/8
Sidcar .....			
1913 2½ h.p. PREMIER .....	13 0	—	—
1916 Coach-built Body	6 6	—	—
only, grey finish .....			
1916 Sidcar, coach, cigar	9 18 6	—	—
shape body, s.s. .....			
Wicker Sidcar .....	2 5 0	—	—

1916 Tyre Catalogue now ready, post free.

**SPECIAL AGENTS for REX and J.A.P. PARTS.  
TRADE SUPPLIED.**

**H. TAYLOR & CO., LTD.**

**Showrooms: 21a, STORE STREET, W.C.**

**Wholesale: 38, ALFRED PLACE, W.C.**

Garage: 12, Tottenham Mews, W.C.

Phone—Museum, 1240.

Telegrams—"Dynametro, Westcent London."

## MOTOR CYCLES FOR SALE.

## Motosacoche.

**MOTOSACOCHE** 1913 3½ h.p. Twin, Enfield gear; 26 gns.—Troward, 78, High St., Hampstead. Phone: 5392. [7402]

**MOTOSACOCHE**, 2½ h.p., new piston, and belt, Bosch mag., lamps, horn, and tools complete; £15.—Williams, 10, College St., Lampeter. [X2549]

## New Hudson.

**NEW** Hudson, late 1913, 3½ h.p., 3-speed, kick, good condition; £25.—J.D., 60, Bankfield Rd., Huddersfield. [X2769]

**1915** 3½-4 h.p. New Hudson, coachbuilt sidcar, 3-speed gear box, new condition; £60: cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea. [0821]

**1915** New Hudson, 4 h.p., countershaft 3-speed, handsome coachbuilt sidcar, complete set of lamps, usual spares, etc., reliable outfit, new condition; take lightweight New Hudson or other good machine part payment; sell £57/10.—Newham, 225, Hammersmith Rd., W. [7434]

## New Imperial.

**NEW** Imperial-Jap, 1916 models, in stock: £38 and £44/8.—Crow Bros., Guildford. [6450]

**NEW** Imperial 1915 2-speed; 24 gns.—Troward, 78, High St., Hampstead. Phone: 5392. [7403]

**NEW** Imperial-Jap, 1916 models, in stock: £38 and £44/8.—Rose, Imperial Agent, Uxbridge. [7515]

**COLMORE** Depots, Manchester and Leicester, for immediate delivery of New Imperial motor cycles. [7085]

**IMPERIAL-J.A.P.**, 1916, 2½ h.p., 2 speeds, brand new; owner called up.—Naylor, Goxhill, Lincs. [X2763]

**NEW** Imperial, 1916, 2½ h.p., light tourist, 2 speeds, hardly soiled; £35.—P. J. Evans, John Bright St., Birmingham. [X2700]

**1916** New Imperial-Jap, 2-speed, variable ignition, run under 200 miles; £32.—17, St. Philips Rd., Dalston, London. [7310]

**NEW** Imperial, 2-speed, new; special bargain, £36/15 cash; gradual payments 2%.—Referee Cycle Co., 332, High Holborn. [0765]

**NEW** Imperial, 1916, 2-speed, only done 100 miles, as new, fully equipped; £32, must sell.—29, Brigstock Rd., Thornton Heath. [7390]

**NEW** Imperials, latest models in stock; 2-speed, also kick-starter hand-controlled clutch models.—P. J. Evans, John Bright St., Birmingham. [X2707]

**1915** New Imperial-Jap, 2½ h.p., 2-speed, splendid condition throughout, not ridden 7 months; £28.—Brodey, 88, Clemeats Rd., East Ham. [7356]

**1916** New Imperial-Jap's, 2-speed models, from stock, £38; also clutch and kick start models, £44/8.—Vauchope's, 9, Shoe Lane, Fleet St., London. [7452]

**NEW** Imperials, the handy lightweight, with J.A.P. engine and 2-speed gear. We are the accredited agents for Manchester and Liverpool districts, and can offer immediate delivery from stock; extended terms and exchanges arranged. Call or write.—Colmore Depot, 31, Renshaw St., Liverpool, and 261, Deansgate, Manchester. [0814]

## New Ryder.

**NEW** Ryder-Jap, 2½ h.p., 2 speeds, lamp, horn, etc., like new; £27/10.—Taylor, 70, Heath St., Hampstead. [X2739]

**NEW** Ryder, late 1914, practically new, 2½ h.p., 2-speed, Miller lamp, generator, rear lamp, horn, foot-rests: 25 gns.—7, Wrotham Rd., Gravesend. [X2454]

## Norton.

**1916** Norton T.T. in stock.—Parker and Son, St. Ives, Hunts. [7347]

**NORTON** 1916 Big Four Practically New Combination, run 1,600 miles, speedometer; 70 gns.—Warren's, 6, Warren St., London. [7446]

**NORTON**, 3½ h.p., good condition; £30; may be seen by appointment in Blackheath.—Reply to A. Branch, 15, Edmunds Place, Aldersgate St., E.C. [7353]

## N.S.U.

**N.S.U.**, 1911 twin, F.E. Bosch, perfect condition, tyres nearly new, lamps, horn, etc.; 12 gns.—428, Camden Rd., N. [7354]

**N.S.U.**, 3½ h.p., 2-speed, free engine, m.o.i.v., just overhauled; £18, or offers.—C/o Manager, School of Mechanics, Eton College, Windsor. [7262]

**BARGAIN**—3½ h.p. 1911 N.S.U. 2-speed free engine motor bicycle, also sidcar, in excellent condition; sell for £15, nearest offer.—Job, Gwynant, Crowborough. [7477]

## O.K.

**O.K.**, 1914, 2-speed; £22, offers.—Parker and Son, St. Ives, Hunts. [7351]

**1914** O.K. Junior, 2hp., 2-speed, perfect condition; £16.—Apply, Gorbald, 47, Landown Rd., Canterbury. [X2464]

**O.K.** Junior, 2½ h.p., 2-speed, handle-bar clutch, only done 300 miles, unspratched; £27, no offers.—Wilkinson, Oakleigh Rd., Clayton, Bradford. [X2741]

**O.K.**, 1915½, 2½ h.p. J.A.P., 2-speed, tyres, enamel, plating, practically new condition, 4-40 m.p.h., 110 m.p.g., lamps, accessories; any trial; £26.—41, Braemar Av., Wood Green. [X2793]

## MOTOR CYCLES FOR SALE.

P.M.

P.M. 3½ h.p. Combination, new Aug., 1914, new condition throughout; £27/10.—Stevens, Goxhill, Lincs. [X2762]

P. and M.

P. and M. 3½ h.p., late 1913, little used, perfect; £32.—Vicar, Silkstone, Yorks. [7279]

P. and M. Combination, 1913, 2 speeds, perfect; £24.—11, Luna Rd., Thornton Heath, S.E. [7380]

1914½ Phelon-Moore Combination, fully equipped; bargain, £62/10.—Abson, 49, Kirkgate, Wakefield. [X2776]

1913½ P. and M. Combination, in thorough order; nearest £35.—Toogood, Langford, Wellington, Somerset. [X2644]

1914 3½ h.p. P. and M., 2-speed, wicker sidcar, in perfect condition; cash or easy terms; £45.—R. E. Jones (Garages), Ltd., Swansea. [0721]

P. and M., 2-speed, 1911, splendid order, C.B. under-lung sidcar, Cowey, P. and H., etc.; £28.—Clonette, 44, Kilburnia Av., N. Croydon. [7288]

1913 P. and M., coach sidcar, 3 new tyres, recently renovated and overhauled by makers, splendid machine; £35; exchanges considered.—Waltou, Dawson Sq., Barnley. [X2674]

Peugeot.

PEUGEOT, 5.6 h.p., twin, mag., B.B. carburettor, spring forks, good running order; £10.—455, York Rd., Wandsworth. [7421]

Pierce.

PIERCE-ARROW, 5 h.p., 4-cyl., 1913 show model, 2-speed, hand clutch, sump oiling, new tyres and tubes, unpunctured, electric horn and spares; £37; by appointment.—Wood, Cottage, Wembley Park, N.W. [7543]

Premier.

PREMIER and Sidcar, 1913, running order; bargain, £20.—511, High Rd., Ilford. [7364]

1914 3½ h.p. Premier, 2 speeds, coachbuilt sidcar; £45; cash or easy terms.—R. E. Jones (Garages), Ltd., Swansea. [0823]

1912 Premier, 3½ h.p., 2 speeds, clutch, kick-start, lamp, horn, coachbuilt sidcar, etc.; bargain, £25.—Earl, 5, Heath St., Hampstead. [7416]

PREMIER, 3½ h.p., free engine, B. and D. carburettor, perfect condition, tyres good; cheap; wounded soldier, no further use.—1, Derby Villas, North Finchley. [7561]

PREMIER, late 1913, 3½ h.p., twin, 3-speed, clutch, not done 2,000 miles, as new, fully equipped; £30, or with cane sidcar £35, must sell.—29, Stock Rd., Thornton Heath. [7389]

LATE 1912 3½ h.p. Premier, 3 speeds, just been thoroughly overhauled and enamelled at cost of over £11 (bill produced), very fast, and in fine mechanical order, tyres and tubes excellent; exchange with cash for B.S.A. or James, 41½ h.p., or other good make, or sell £28, bargain.—Fabery, 9, Ledsam St., Birmingham. [X2735]

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P.V., spring frame, 1913, 3½ h.p. twin J.A.P., 2-speed, just overhauled by expert, many new parts fitted, including tyres and belt; little beauty; only got to try it; £34.—Box 563, c/o The Motor Cycle. [X2806]

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RADCO, 1914, 2-speed 2-stroke; £16; bargain.—21, Tindal St., Chelmsford. [6981]

RADCO, 2½ h.p., 2-stroke, excellent order and condition; bargain, £21.—14, Dodbrooke Rd., West Norwood. [7519]

RADCO, 1915, lamps, horn, etc., like new; £22, or exchange.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [7300]

Rex.

REX 4 h.p. twin and sidcar, 2-speeds; £24.—21, Tindal St., Chelmsford. [6980]

1914 6 h.p. 3-speed Rex and Sidcar, as new; £50.—Wilkin, Hunter's Bar, Sheffield. [X2758]

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REX, 6 h.p. twin, sidcar, first-rate condition, accessories, Stewart speedometer; £35.—Vicarage, Southgate, N. [7522]

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REX, 3½ h.p., 1913, 2 speeds, free engine, Bosch, new Dunlop tyre and belt, lamps, tools; £26.—Lieut. Dewhurst, Forton Barracks, Gosport. [X2671]

1913 6 h.p. Rex Combination, lovely turnout, lamps, horn, speedometer, just overhauled; £30; take Douglas or Triumph in part.—Bunting, Harrow. [7501]

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6 h.p. Rex, F.E., kick start, new Bosch mag., B. and H., Druids, good tyres, splendid condition, with new C.B. sidcar; £27.—Pittack, Railway Station, East Ham. [7557]

REX Twin, 5.6 h.p., and sidcar, 1912, mag., 2-speed, free engine, handle starting, in good order, and most reliable; £22.—14, Dodbrooke Rd., West Norwood. [7511]

REX, 6.8 h.p., 1913, clutch, 2-speed, handle-start, mirror, speedometer, Lucas lamp, tools complete, coachbuilt sidcar, all in splendid condition; £50.—Apply, 19, Bow Lane, Leyland. [7410]

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ROVER, 3½ h.p., free engine; £22; good tyres.—21, Tindal St., Chelmsford. [6979]

ROVER, 1913, 3½ h.p., 3-speed, driven only by owner since new; £36.—W. Ball, 72, Sydney St., Chelmsford, S.W. [7336]

ROVER, 1914, 3½ h.p., 3-speed, and C.B. sidcar, first-class condition; £46.—R.B.B., 8, Albert Sq., Clapham, S.W. [7296]

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1913 3½ h.p. 3-speed Rover, new extra heavy R.S. Dunlop back tyre, low saddle position, engine recently overhauled, Lucas lamps and horn; £28.—The Premier Motor Co., Aston Rd., Birmingham. [7539]

Royal Ruby.

ROYAL Ruby, 1916, 2½ h.p., 2-stroke, perfect, done 400 miles, beautiful condition, fully equipped, numerous spares; £26/10, offers.—Booth, Paddington Infirmary, London. Phone: 4503 Paddington. [7363]

Rudge.

£20.—1913 Rudge racer, gear, clutch, lamps, spares.—17, Hamilton Terrace, N.W. [7366]

RUDGE, free engine, 1912, just done up by makers, £26.—21, Tindal St., Chelmsford. [6975]

1912 3½ h.p. Rudge, free engine, good condition; £25.—R. E. Jones (Garages), Ltd., Swansea. [0785]

1912 Rudge Combination, in perfect order; after 8 o'clock; £25.—Smith, 180, Clapham Park Rd. [7431]

RUDGE Multi, 3½ h.p., nearly new, all accessories; £35.—Muswell Hill Garage and Motor Works, Ltd., Muswell Hill. [7340]

3½ h.p. T.T. Isle of Man Rudge Multi, fast machine, 32 fitted with all accessories; £55.—Wanchope's, 9, Shoe Lane, London. [7461]

3½ h.p. Rudge Multi, 1915 model, free engine, smart machine; £45; accessories complete.—Wanchope's, 9, Shoe Lane, London. [7454]

1916 5.6 h.p. Rudge Multi and Sidcar, Cowey speedometer, Lucas head and rear lamps, etc.; £70.—21, New Bond St., Leicester. [X2767]

1915 Rudge Multi, 3½ h.p., delivered August, done 600 miles, Miller's lamp and horn complete, unpunctured; nearest £46.—The Garage, Whitland, S. Wales. [7518]

RUDGE Multi, 3½ h.p., T.T., actual winner of the last Isle of Man T.T. race, very fast, sound and reliable solo mount; £50.—Elee and Co., 15-16, Bishopsgate Av., Cannon St., E.C. [0552]

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**COLMORE** Depots, Birmingham and Manchester, for Scott motor cycles. [0806]

**1913-14** Scott Combination, excellent condition, £15  
1915 Canelet sidecar: £36/10; want cash.—Box  
L1,682, c/o *The Motor Cycle*. [7553]

**SCOTT**, 1913, and Canelet, Binks, sight feed oil, other 1915 improvements, the whole in splendid condition; trial; £40, bargain.—32, Princess Gate Mews, South Kensington. [7383]

**SCOTT**, 1914 model, fitted with new Mills-Fulford sidecar, complete with all accessories, runs slow and fast, a nice, superior combination; £55.—Wauchope's, 9, Shoe Lane, London. [7455]

**1913** Scott and Gloria Sidecar, speedometer, full equipment, fine condition; any reasonable trial given; £35/10.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, [5660]

## Singer.

**1914** Singer Light Car, dynamo lighting set; £155; Douglas part.—Cross, Effingham Sq., Rotherham. [X2734]

**SINGER**, 1913, 3½ h.p., free engine, and coachbuilt sidecar, nice order; £25.—Warren's, 6, Warren St., London. [7443]

**SINGER**, T.T., 3½ h.p., speedometer, perfect condition; £23, or exchange Douglas.—108, Broadway, Cricklewood. [7523]

## Simplex.

**SIMPLEX**, 2½ h.p., 2-stroke, condition like new throughout; £21/10; any trial.—Colmore Depot, 31, Colmore Row, Birmingham. [X2619]

## Sparkbrook.

**LATE** 1914 6 h.p. Sparkbrook Combination, 2 speeds, foot clutch, kick-start, everything guaranteed in perfect condition, very little used; owner has bought car; £60, or near offer.—T. V. Lister, Hotel Burlington, Dover. [X2827]

## Sun.

**SUN**, 2-strokes; all models from stock from £29/10.—Colmore Depot, 261, Deansgate, Manchester. [6025]

**SUN-VILLIERS**, 1915, 2-stroke, single-speed; £19/10.—Robson, Coronation Rd., Cheltenham. [X2765]

**COLMORE** Depots, Birmingham and Manchester, for delivery from stock of all models of Sun motor cycles. [0807]

**SUN** 2-strokes, 1916 models, single and 2-speeds; delivery from stock.—Jackson Wright, 10, Pudding Chare, Newcastle-on-Tyne. [6611]

**SUN-VILLIERS**, 1915, 2 lamp sets, horn, auxiliary tank, footboards, T.T. bars, condition as new.—Parker, 1, Wiloughby Rd., Acton Vale. [7430]

**1916** Sun, 2½ h.p. V.T.S. engine, 2-stroke, 2-speed; original net price £37, not ridden 50 miles, genuinely new as list; £33.—Robinson's Garage, Green St., Cambridge. [7488]

**1913** Sun, 3½ h.p. Precision engine, 2-speed, powerful, reliable, complete lamps, etc.; £30; pay cash difference for 1914 combination.—Newham, 223, Hammersmith Rd., W. [7436]

## Sunbeam.

**SUNBEAM**, new 1916 3½ h.p. standard model actually in stock.—Moss, Wey. [X2809]

**2½ h.p.** Sunbeam, 1914 model, 2-speed gear and chain drive; £32/10.—Wauchope's, 9, Shoe Lane, London. [7459]

**SUNBEAM**, new 1916, 3½ h.p., standard model, actually in stock.—Rose, Sunbeam Agent, Uxbridge. [7516]

**SUNBEAM**, 3½ h.p., 1915 (July), big F.R.S. lighting set, etc.; £58.—7, Blenheim Av., Whalley Range, Manchester. [X2613]

**SUNBEAM** 1914 Combination, new condition, ridden very little; £69.—Morris, 32, Fairbourne Rd., Levenshulme. [X2791]

**1914** 6 h.p. Sunbeam and sporting Fitsu coachbuilt sidecar, 2 head lamps, etc., magnificent outfit, in fine condition; £69/10.—Crow Bros., Guildford. [7114]

**1916** 3½ h.p. Sunbeam, with Mills-Fulford Skiff sidecar, usual black-gold finish, with 2 lamps, horn, etc., latest improvements; instant delivery, little used; £87.—Robinson's Garage, Green St., Cambridge. [7487]

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**TORPEDO-PRECISION**, 2½ h.p., Clincher tyres, B. and B. mag., adjustable pulley, in practically new condition, hardly scratched; bargain, £26; exchanges.—Ideal Cycle, Thundersley, Essex. [7361]

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**1911** Triumph free engine, complete; £21.—Cross, Jeweller, Rotherham. [X2733]

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**TRIUMPH**, 3½ h.p., F.E., clutch, with accessories, perfect order; 26 gns.—Railway Garage, Staines. [7545]

**TRIUMPH**, 3½ h.p., clutch model, horn, lamps, in good condition; £20.—Hicks, 67a, High St., Maldon. [X2202]

**1913** 3½ h.p. 2-speed Triumph and Sidecar, just been re-enamelled; £35.—Wilkie, Hunter's Bar, Sheffield. [X2759]

**T.T.** Triumph, enamelled and plated, new tyres; £22.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [7299]

**TRIUMPH**, 1912, clutch model, lamps, accessories, perfect condition; £22/10.—456, Whitehorse Rd., Thornton Heath. [7332]

**3-SPEED** Triumph and Sidecar, 1914 model, all accessories; any trial; £47.—Harford and Co., Station Rd., Canterbury. [6988]

**TRIUMPH**, 3½ h.p., clutch, with Godiva coachbuilt sidecar, spares, splendid condition; £40.—Capern, Crimchard, Chard. [X2693]

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**TRIUMPH**, 1911, 3½ h.p., clutch model, combination, good tyres, Montgomery sidecar, excellent condition; £26.—J. Shelton, 44, Park Rd., Wolverhampton. [X2451]

**TRIUMPH**, 1911, 3½ h.p., new tyres, newly enamelled and plated, many improvements, complete with accessories; £18/10.—3, The Mews, Victoria Rd., Chatham, S.W. [7483]

**1915** Countershaft Triumph, 4 h.p., 3-speed, coachbuilt torpedo sidecar, speedometer, lamps, equal to new, 1,500 miles only; £68.—Willson, 22a, Princes Sq., Bayswater. [7521]

**1913** 3½ h.p. Triumph, 3-speed Sturmer-Archer gear, with coachbuilt sidecar, and accessories; owner gone to France; £36, complete, bargain.—Robinson's Garage, Green St., Cambridge. [7491]

**TRIUMPH**, 3½ h.p., and sidecar, free engine, and N.S.U. 2-speed gear, latest type spring forks, just overhauled, and in beautiful condition; £30, or near offer.—S. S. Nevill, 79a, Parkhurst Rd., Holloway, N. [7257]

**1914** Triumph, 4 h.p., Sturmer-Archer 3-speed, Montgomery coachbuilt sidecar, completely equipped, very smart outfit; bargain, £49/15; take light solo machine part payment.—Newman, 223, Hammersmith Rd., W. [7435]

**TRIUMPH**, 1913½, clutch, Philipson pulley, Milford coachbuilt sidecar, new tyres, spares, fine condition; £39; exchange T.T. Triumph, or 2-stroke, and cash.—Jackson, 125, Belgrave Rd., New Maston, Manchester. [X2789]

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**1915** Villiers 2-stroke, in splendid condition, very fast; exchange for 1913 2-speed Douglas, or with cash for 1914.—S., 22, Hatfield Rd., Stratford. [7374]

## White and Poppe.

**WHITE** and Poppe, 3 h.p., mag., Senspray, Druid forks, etc.; bargain, £14; exchange 2-stroke, cash adjustment.—Butlin, 116, Fortess Rd., Kenton Town. [X2664]

## Williamson.

**8 h.p.** Williamson, water-cooled engine, 2-speed gear and clutch, fitted with a 2-seated side-by-side sidecar, complete, including hood and screen; £55.—Wauchope's, 9, Shoe Lane, London. [7460]

## Wolf.

**2½ h.p.** 2-stroke Wolf, free engine, 2 speeds, fine 2nd order; £22.—Motor Exchange, 24, The Parade, Tooting, S.W. [7559]

**WOLF**, 4 h.p., 1916, 3-speed countershaft gear, kick starter, chain drive, hand-controlled clutch; £55/10/6; exchanges entertained.—Eagles and Co., High St., Acton, W. [X2725]



## MOTOR CYCLES FOR SALE.

## Zenith.

3 $\frac{1}{2}$  h.p. Zenith, variable gear, and coachbuilt sidecar, good running condition; £52.—G., Hill View, Cheddar. [7551]

ZENITH-GRADUA, 1915, 5b.p., countershaft, kick-starter, clutch; bargain, £46.—Leeming, Back Lord St., Halifax. [X2764]

ZENITH-GRADUA, 3 $\frac{1}{2}$  h.p. J.A.P., T.T. bars, lamp, horn, all in perfect order; £25; exchanges considered.—Bruce, Joiner, Newnham-on-Severn. [X2782]

## Ladies' Machines.

LADY'S Royal Ruby-Jap, 2 $\frac{1}{2}$  h.p., 2-speed; £38/5.—Hucklebridge, 133, Sloane St., London, S.W. [X2747]

DOUGLAS, 2 $\frac{1}{2}$  h.p., lady's, free engine, handle start, condition good; £19/10.—Jones, c/o 52, Broad St., Worcester. [X2748]

LADY'S 2-speed 2-stroke Motor Cycle, 2 $\frac{1}{2}$  h.p., countershaft gear; £26/10.—Colmore Depot, 31, Colmore Row, Birmingham. [X2620]

1916 O.K., lady's open frame, Mark 3, 2-speed, clutch, not ridden 20 miles; £37/10.—Robinson's Garage, Green St., Cambridge. [7489]

FOR SALE, the fastest and most powerful lady's motor cycle yet produced. It is made for the sporty lady who will have the best that money can buy. The 3 $\frac{1}{2}$  h.p., horizontally opposed Brough with overhead valves, 3-speed countershaft, h.b.c. clutch, and kick starter, is dug out entirely for a lady's use. It is "the" lady's model. £65 complete. Done 600 miles only.—Apply, Box 556, c/o The Motor Cycle. [X2465]

## Miscellaneous.

1913 3-speed Triumph, tyres as new; £34.

1913 3-speed Triumph and Cowey speedometer, and lamps, and wicker sidecar; £38/10.

1915 Sun 2-stroke, 2-speed, as new; £27.—Bull, St. Giles' Sq., Northampton. [X2775]

HEBDEN'S have actually in stock for immediate delivery:

NEW 1916 Royal Enfields, 2 $\frac{1}{2}$ , 3, 6, and 8 h.p. models.

NEW 1916 Brough, 3 $\frac{1}{2}$  h.p. twin, 3-speed countershaft gear, and 16 ga. sidecar, a beauty; £85.

HARLEY-DAVIDSON Combination, 7-9 h.p., brand new; list price £95, to clear £85.

1916 2 $\frac{1}{2}$  h.p. Jap-New Imperial, 2-speed, clutch, and kick starter; £44/8.

1916 2 $\frac{1}{2}$  h.p. Jap-New Imperial, 2-speed; £38.

1916 2 $\frac{1}{2}$  h.p. Jap-New Imperial Lady's 2-speed, clutch, and kick-starter; £46/8.

1915 2 $\frac{1}{2}$  h.p. Wolf, 2-stroke, 2-speed; £33/10; accept £28; a gift, brand new.

1915 2 $\frac{1}{2}$  h.p. Wolf, Peco engine, 2-speed; £35/10; accept £30 to clear; brand new.

1914 Clyno, 2 $\frac{1}{2}$  h.p., 2-speed, guaranteed just like new; £28.

1914 3 h.p. Enfield, grand condition; £30.

1915 2 $\frac{1}{2}$  h.p. Calthorpe-Jap, 2-speed, splendid order; only £26.

2 $\frac{1}{2}$  h.p. Premier, 3-speed, clutch, perfect condition, a beauty; £21.

NEW Williamson Cycle Car, 8 h.p. Douglas engine, and 3-speed gear; £126 list, no reasonable offer refused.

HEBDEN'S Motor Mart, St. James' St., Burnley. Tel.: 488. [6491]

EAGLES.—Douglas, 2 $\frac{1}{2}$  h.p., 1914, 2 speeds, free engine, kick-starter, new condition; £38.

EAGLES.—Triumph, 1913, 3 $\frac{1}{2}$  h.p., T.T. model, hand controlled, Philpotts pulley, fine condition; complete, £29.

EAGLES.—Levis, 2 $\frac{1}{2}$  h.p., 1915, Popular 2-stroke, single speed; £19/10.

EAGLES.—Triumph, 3 $\frac{1}{2}$  h.p., 1911-12, clutch model, N.S.U. 2-speed gear, with Montgomery £14/14 sidecar; £32.

EAGLES.—Wolf, 2 $\frac{1}{2}$  h.p., 1914, overhead inlet valve, variable mag., fine condition; £17/10.

EAGLES.—Wolf, 2 $\frac{1}{2}$  h.p., 1916, 2-stroke, as new; £23/10.

EAGLES.—Sun-Villiers, 2 $\frac{1}{2}$  h.p., 2-stroke, T.T. handlebars, fine condition; £19/10.

EAGLES.—N.S.U. 6-7 h.p. latest pattern twin, loop frame, rear springs, heavy type 2-speed gear, kick starter, fine sidecar machine; £33/10.

EAGLES.—Levis 2 $\frac{1}{2}$  h.p. 1915 Popular 2-stroke, perfect condition, fully equipped; £22/10.

EAGLES.—Any of the above can be had on approval "The Motor Cycle" deposit system.—Eagles and Co., High St., Aston, W. [X2723]

MOTOR Cycle, 3 h.p., mag., requires slight repairs; £6.—169a, Lower Clapton Rd., N.E. [X2718]

4/10.—3 $\frac{1}{2}$  h.p. Automotor engine Chater-Lea, dropped frame, tyres perfect, coll.—Railway Garage, Staines. [7546]

## NEW MACHINES IN STOCK, 1916's.

7-9 h.p. HARLEY-DAVIDSON and Sidecar, Model 16F ..... £101 15

7-9 h.p. HARLEY-DAVIDSON Combinat'n, electric equipment ..... £110 0

7-9 h.p. HARLEY-DAVIDSON, elec. model, solo ..... £89 0

6 h.p. ENFIELD Comb'n, standard outfit ..... £89 5

3 h.p. ENFIELD, 2-speed, kick starter ..... £52 10

6 h.p. ENFIELD Tradesman's Carrier (box alone 15 gns.) ..... £89 5

4 $\frac{1}{2}$  h.p. B.S.A., chain drive ..... £64 0

4 $\frac{1}{2}$  h.p. B.S.A., belt-cum-chain ..... £62 0

5 h.p. INDIAN Com. (machine alone £70) ..... £86 10

7-9 h.p. INDIAN, Model G, Powerplus ..... £75 0

3 $\frac{1}{2}$  h.p. ARIEL Combination ..... £82 10

6 h.p. NEW HUDSON Combination, fawn finish, 3-speed ..... £92 8

2 $\frac{1}{2}$  h.p. NEW HUDSON, 2-speed, Model C ..... £38 0

2 $\frac{1}{2}$  h.p. NEW HUDSON, 2-speed, de luxe ..... £42 0

7-9 h.p. INDIAN, Model F, Powerplus, electric, and Sidecar ..... £106 10

2 $\frac{1}{2}$  h.p. LEVIS Popular ..... £32 0

2 $\frac{1}{2}$  h.p. LEVIS, No. 1, Model E, 2-speed ..... £47 10

2 $\frac{1}{2}$  h.p. CALTHORPE-J.A.P., 2-sp. Enfield ..... £37 16

2 $\frac{1}{2}$  h.p. ALLDAYS ALLON ..... £36 0

2 $\frac{1}{2}$  h.p. ALLDAYS ALLON, 2-speed ..... £42 0

2 $\frac{1}{2}$  h.p. ALLDAYS ALLON, 2-speed, clutch ..... £45 0

2 $\frac{1}{2}$  h.p. NEW IMPERIAL light tourist, 2-sp. ..... £38 0

2 $\frac{1}{2}$  h.p. NEW IMPERIAL, 2-sp., kick starter ..... £44 8

NEW 1915 MODELS (Shop-soiled only)

2 $\frac{1}{2}$  h.p. CONNAUGHT, single-speed ..... £32 0

2 $\frac{1}{2}$  h.p. HOBART, 2-speed, 2-stroke ..... £33 10

## SECOND - HANDS.

1914 4 $\frac{1}{2}$  h.p. B.S.A., 3-speed, and Corvette Sidecar ..... £49 10

1912 2 $\frac{1}{2}$  h.p. DOUGLAS, 2-sp., kick starter, good appearance ..... £26 10

1915 8 h.p. MATCHLESS Comb'n, M.A.G. engine, Montgomery Sidecar, Lucas accessories, Jones speedometer ..... £73 10

1915 7-9 h.p. HARLEY-DAVIDSON, elec. model, and Empress Sidecar ..... £68 10

1913 3 $\frac{1}{2}$  h.p. REX, 2-speed, and Sidecar, good condition ..... £35 0

4 $\frac{1}{2}$  h.p. 1915 JAMES Combination, 800 m. 1916 ENFIELD Combination, 8 h.p., hood, screen, all Lucas accessories, ridden approx. 1,000 m. .... £95 0

1915 4 $\frac{1}{2}$  h.p. WOLF Combination, 3-speed, kick starter ..... £52 10

INDIAN, Model C, spring frame, electric equipment, best coach Sidecar, and wind screen, scarcely used ..... £68 10

1915 ALLON, single-speed, and accessories ..... £26 10

1914 4 $\frac{1}{2}$  h.p. B.S.A., 3-speed, all-chain drive ..... £42 0

1912 2 $\frac{1}{2}$  h.p. SERVICE-PRECISION, single-speed ..... £16 10

1913 3 $\frac{1}{2}$  h.p. P. & M., 2-speed ..... £39 10

1915 2 $\frac{1}{2}$  h.p. NEW IMPERIAL-J.A.P., 2-sp. (ridden 1,000 m.) ..... £21 10

1912 B.S.A., 2-speed, 3 $\frac{1}{2}$  h.p., Hutchinson and Avon tyres, Dunlop belt, nearly new ..... £30 0

## SIDECARS.

WATSONIAN, PHOENIX, INDIAN, CANOELET, MILLFORD IN STOCK.

DEFERRED PAYMENT TERMS 5% extra, payable quarter down and balance in 12 monthly instalments. Substantial discounts if account is cleared in one, three, or six months.

WANTED, a few first-class Solo and Combination Outfits. Cash on acceptance. Call with them if possible.

FORD new Nov., 1915, rear wind screen, shock absorbers back and front, Steptey wheel and tyre, speedometer, exhaust whistle and syren, special running boards and tool chest, oil lamps, carefully used ..... £128 10

151, HIGH ST., WALTHAMSTOW, N.E. Phone: Walthamstow 169. 5 minutes Hoe St. (G.E.R.)

50, HIGH RD., WOOD GREEN, N. Phone: Hornsey 1956. Hours—9 to 8-30. Thursdays, 1 o'clock.

LAMB,

## MOTOR CYCLES FOR SALE.

## Miscellaneous.

COLLIER'S Motories for cash bargains or exchanges.—Address, Deal St., Halifax.

COLLIER'S.—Triumph, 3 $\frac{1}{2}$  h.p., mag., new tyres, £15/10; 1909 3 $\frac{1}{2}$  h.p. Triumph, £19/10.

COLLIER'S.—1912 3 $\frac{1}{2}$  h.p. 2-speed Humber, £26/10; 1912 3 $\frac{1}{2}$  h.p. 2-speed chain-drive Bradbury, £22/10.

COLLIER'S.—Royal Ruby, 2 $\frac{1}{2}$  h.p., 2-speed, 2-stroke, slightly shop-soiled; £31/10.

COLLIER'S.—1915 2-speed Ivy 2-stroke, wants tuning up, £21/10; Douglas, 2 $\frac{1}{2}$  h.p., single-speed, £12/10.

COLLIER'S.—New electrically-equipped American Excelsior; pre-tax price, £71/10, cannot repeat.

COLLIER'S.—Humber, 3 $\frac{1}{2}$  h.p., wants attention, £37/6; 1912 3 $\frac{1}{2}$  h.p. 2-speed Premier, £22/10; sidecar, £3/10 extra.

COLLIER'S.—1913 3 $\frac{1}{2}$  h.p. 2-speed Torpedo and sidecar, £29/10; 2-speed twin Minerva and sidecar, £19/10.

COLLIER'S.—1912 3 $\frac{1}{2}$  h.p. Zenith-Gradua, £24/10; 1915 2 $\frac{1}{2}$  h.p. 2-speed Wizard, 2-stroke, wants repairs, £19/10.

COLLIER'S.—Rex brand new 6 h.p. sidecar combination, £71, offers wanted; new Rex sidecar, £12/10.

COLLIER'S.—Twin Minerva, 2-speed, coach sidecar, £17/10; 1913 3 $\frac{1}{2}$  h.p. Rover, Grado gear, £25/10.

COLLIER'S.—Motosacoche mag. lightweight, excellent machine, £9/15; 1913 2 $\frac{1}{2}$  h.p. mag. Precision, £15/10.

COLLIER'S.—1915 Rex twin sidecar combination, £43/10; 1914 combination, almost as new, £49/10.

COLLIER'S.—1908 5 $\frac{1}{2}$  h.p. free engine twin Rex, £13/10; Royal Ruby, 6 h.p., 3-speed, merely soiled, £67, makers' price £87.

COLLIER'S.—N.S.U., 3 $\frac{1}{2}$  h.p., 2-speed, £19/10; 6 h.p. 2-speed twin Rex and sidecar, £22/10; 3 $\frac{1}{2}$  h.p. mag. Humber, vertical m.o.v. engine, £12/10.

COLLIER'S.—3 $\frac{1}{2}$  h.p. free engine Rudge, £19/10; 3 $\frac{1}{2}$  h.p. free engine Triumph, £19/10.

COLLIER'S quote the keenest exchanges. Send for full list.—Address, Deal St., Halifax. [0826]

WANDSWORTH Motor Exchange.—Greatest bargains ever known; whole stock must be sold.

WANDSWORTH.—Easy payment system, only quarter down secures, balance 12 monthly instalments.

WANDSWORTH.—Brand new Imperial-Jap, 2 $\frac{1}{2}$  h.p. mag., 2 speeds countershaft; £35/15; exchanges.

WANDSWORTH.—P. and M. (late), 3 $\frac{1}{2}$  h.p. mag., 2 speeds countershaft, practically new; £35; exchanges.

WANDSWORTH.—Martin, 1915, genuine racing machine, 4 h.p., mag., very fast; £38/10; exchanges.

WANDSWORTH.—Zenith, 1912, 4 h.p. J.A.P., Bosch, Gradua gear, good order; £21; exchanges.

WANDSWORTH.—Premier (late), 3 $\frac{1}{2}$  h.p. mag., 3 speeds, clutch, nice order; £30; exchanges.

WANDSWORTH.—Alldays Allon, 1916, 2 $\frac{1}{2}$  h.p., 2 speeds, clutch; cost £45, offers: exchanges.

WANDSWORTH.—Ivy, 1915, 2 $\frac{1}{2}$  h.p. mag., nice little machine; only £23/10; exchanges.

WANDSWORTH.—Rover, 1914, 3 $\frac{1}{2}$  h.p. mag., 3 speeds, clutch, nearly new; £38/10; exchanges.

WANDSWORTH.—Bradbury, 1913, 3 $\frac{1}{2}$  h.p. mag., 2 speeds, F.E., new tyres; £26/10; exchanges.

WANDSWORTH.—F.N., latest 5-6 h.p., Bosch 2 speeds, clutch, practically new; £35; exchanges.

WANDSWORTH.—Clyno 1912 5-6 h.p. twin, Bosch, 2 speeds countershaft, powerful; £27/10; exchanges.

WANDSWORTH.—Royal Enfield lightweight twin, mag., nice little machine; only £15/10; exchanges.

WANDSWORTH.—Rex, with coach sidecar, 5-6 h.p. twin, mag., 2 speeds; £25; exchanges.

WANDSWORTH.—Albington King Dick, 1912, 3 $\frac{1}{2}$  h.p. mag., 2 speeds, kick; £23/10; exchanges.

WANDSWORTH.—Rex, 1911, 3 $\frac{1}{2}$  h.p. mag., 2 speeds, dropped frame, nice condition; £14/10; exchanges.

WANDSWORTH.—Motosacoche, 1 $\frac{1}{2}$  h.p. mag., Druid spring forks, running order; £9/15; exchanges.

WANDSWORTH.—Easy terms.—Wandsworth Motor Exchange, Ebner St., Wandsworth Town Station. Phone: Battersea 327. [X2752]

W. BUNTING, North View, Wealdstone, has a large stock of motor cycles for cash or exchange; enquiries invited. [7517]

TRIUMPH, 1910, good order, £16; Rover, accumulator ignition, 3 $\frac{1}{2}$  h.p., low, good goer, £8; Vindee 2-speed and sidecar, 5-6 h.p., £18.—Particulars, V.E.W.S., 160, Norwood Rd., W. Norwood. [7260]

2-STROKE Lightweights.—We have a stock and can offer delivery of Sun, Calthorpe, Diamond, Wolf, Levis, all models; cash or exchange.—Colmore Depot, 261, Deansgate, Manchester, and 31, Renshaw St., Liverpool. [0816]

## MOTOR CYCLES FOR SALE.

## Miscellaneous.

**RIDER TROWARD** has in stock, Allon, Blackburne, Brown, Coventry Eagle, Lewis, New Imperial, New Hudson, New Ryder, Motosacoche, Enfield, Royal Ruby, and others; £10 to £50. See separate advertisements; exchanges, open 9 p.m. and Sundays.—78, High St., Hampstead (one minute tube). [7405]

**MUST be Cleared;** on muctions; room wanted.—£5 to £10.—For a real bargain in second-hand motor cycles, cycle cars, gears, magnetos, etc., you cannot do better than call or write Morgan and Maxwell, The London Motor Mart, 80, High Rd., Streatham, who can positively save you pounds, shillings, and pence. At the moment we have Bat, Brough, B.S.A., Bradbury, Calthorpe, Chater-Lea, Dot-Jap, Enfield, F.N., Humber, Matchless, New Imperial, Premier Combination, Peugeot, R. and M., Rover, Ruger, Singer, Sun-Villiers, Triumph, Lewis, Williamson, Wolf; several cheap sidecars; six 2-speed countershaft gears, new, £5/10 each. Lists free. Trade supplied. [0748]

## TRICARS FOR SALE.

**TRICAR**, 2 speeds, free, 4h.p., water-cooled, complete, perfect order; offers.—Box 564, c/o The Motor Cycle. [X2801]

**31 h.p. Fafnir**, w.c., 2-speed, kick starter, Amac, Bosch, 32 Brooks, new belt; £16; any trial.—13, Waldegrave Rd., Horsey, N. [7268]

**TWO 1913 Autocarrs**, auction prices; offers.—Call 9 to 9, Liquidator, 6c, Lansdowne Hill, West Norwood. Also several vins. [7379]

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**BASTONE'S**—New cigar pattern sidecars, complete with Michelin tyre, £7/10.

**BASTONE'S**—New coachbuilt latest underslung sidecar, complete with Michelin tyre, £7/15.

**BASTONE'S Sidecar Dept.**, 228, Pentonville Rd., King's Cross, London, N. Close 6.30, Saturdays 1 o'clock. [6227]

**MIDDLETON Sidecars**—27, Stroud Green Rd., Finsbury Park, N. [3633]

**LIGHT** Coachbuilt Sidecar, complete, perfect; 5 gns.—Troward, 78, High St., Hampstead. [7404]

**SIDECAR**, perfect condition, fit any machine; £2/10.—Smith, 199b, King St., Hammersmith. [7277]

**UNDERSLUNG** Coachbuilt Sidecar, tyre good; 55/-; appointment.—Rodgers, 9, Mansell Rd., Acton. [X2452]

**WICKER** Sidecar, complete, splendid condition; 35/-.—Broom, 77, Marylebone Lane, London, W. [X2787]

**GROSVENOR 12 gn.** Coachbuilt Sidecar, luggage grid, like new, mileage 100 only; £8.—21, Rupert St., Bolton. [7427]

**EMPIRE** Lightweight Sidecar, complete, perfect condition; £5/10.—MacEwen, Ravenstone, Whitthorn, Wigtownshire. [X2697]

**SIDECAR** or Carrier (convertible), latest new underslung coach, light; £6/10.—Taylor, 637, Seven Sisters Rd., Tottenham. [7478]

**SIDECAR**, Mills-Fulford fittings, low, roomy wicker, side door, good tyre and tube, paint new; 60/-.—Searle, The Cleve, Guildford. [7544]

**SIDECARS**—Several bullet-shaped coachbuilt bodies, with or without chassis, cheap.—Write, Stokes and Holt, Ltd., Belgrave Rd., Leicester. [0718]

**SIDECAR**, light, strong, fit any machine, large cane body, with side door; £4, or near offer.—Oliver, Snadlands, Waltham-on-the-Hill, Surrey. [7428]

**ROVER** Torpedo Sidecar, with 4-ply Dunlop and band brake, £4/10; also Juno wicker sidecar, £3/10.—Juno Showrooms, 248, Bishopsgate, London. [7467]

**WATSONIAN** and Juno Sidecars, 9 models, immediate delivery; cash, or gradual payments from 10/- monthly.—Juno Showrooms, 248, Bishopsgate, London. [7468]

**SPECIAL** Sidecars to suit American Excelsior and Harley-Davidson; Cape hoods 30/-, wind screens 17/6; splendid value in lightweight model at £8.—Melville Sidecars, Halifax. [X1034]

**PHENIX** Sidecars, highest grade; immediate delivery. Send for our 1916 catalogue. Special models for Harley-Davidson, Indian, Yale, and other American motors. Large stock of second-hand sidecars. Special weekly list published. Sidecars on hire. Exchanges made.—Phoenix Motors, Ltd. (Motor Cycle Depot), 736, Holloway Rd., N. Tel.: Horsey 449. [0135]

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**BASTONE'S**—New cigar pattern bodies; £2/5.

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**BASTONE'S Sidecar Dept.**, 228, Pentonville Rd., King's Cross, London, N. [6228]

**2-SEATER** Williamson 1914 coach body, perfect condition; offers.—Innes, Annfield-Paol, Durham. [X2698]

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OUR BIG FACILITIES	6	Enfield Combination	89	5
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OF ALL	6	Enfield, dynamo, Com'n	105	0
SCARCE 1916	3	Enfield, Mods. 140 & 150	52	10
MAKES	2 1/2	Enfield 2-strokes	40	0
& CARRIERS	5	Indian, Model B, 3-sp.	70	0
FROM 3 CWT.	7	Indian, Model G, 3-sp.	75	0
UP.	7	Indian, Model F	83	and £90
WRITE US	7	Indian, Model C	78	0
YOUR		All Indian Sidecars in Stock.		
WANT AND	2 1/2	Calthorpe, 2-str., 2-sp.	32	11
RECEIVE	4	Calthorpe-Jap, 2-speed	37	16
OUR OFFERS.	4	Calthorpe-Jap Comb'n	70	7
	2 1/2	Excelsior, 2-stroke	30	16
	2 1/2	Excelsior, 2-str., 2-sp.	44	2
	2	O.K. Junior, 2-speed	33	1 6
	2	O.K. Junior, 2-stroke	25	10
	2 1/2	B.S.A., 2-sp., M.A.G.	42	10
	4 1/2	B.S.A., Model H	64	0
	4 1/2	B.S.A., Model K	62	0
	4 1/2	Levis Popular	32	0
	2 1/2	Levis de Luxe, 2-sp., ch'n	47	10
	2 1/2	Diamond, 4-str., 2-sp.	38	17
	2 1/2	Diamond, 2-stroke	31	10

STUDY THESE LOW PRICED BARGAINS NEW 1915 REDUCED AND SECOND-HAND MACHINES. THE BIGGEST VALUES ON OFFER.

2 1/2 h.p. DOUGLAS, 1915 War Model	£42	10
2 1/2 h.p. 1914 DOUGLAS, kick start	£38	0
4 h.p. 1914 TRIUMPH, 3-speed, like new	£39	10
8 h.p. 1915 HARLEY-DAVIDSON & Sear	£60	0
3 h.p. 1915 ENFIELD, T.T., 2-speed	£37	10
7 h.p. 1914 INDIAN, 2-sp., spring frame	£47	10
7 h.p. 1915 INDIAN Combination, electric, speedometer, spring frame, new £99, for	£88	0
5 h.p. 1916 INDIAN, 3-sp., used 40 miles	£59	10
2 1/2 h.p. 1915 HOBART, 2-stroke, new	£31	10
2 h.p. 1915 O.K., 2-speed, new	£29	10
1915 ENFIELD, 2-stroke	£26	10
1915 ROYAL RUBY, 2-stroke, as new	£24	0
3 1/2 h.p. 1915 Twin 2-sp. MOTOSACOCHE, new	£48	0
1914 B.S.A., 3-speed, and Sidecar	£45	0
3 1/2 h.p. HUMBER and Sidecar	£28	10
3 1/2 h.p. TRIUMPH, 2-speed	£23	0
2 1/2 h.p. 1916 OMEGA-J.A.P., 2-speed, used 20 miles	£32	0
1915 RABDO, 2-stroke, 2-sp., almost new	£26	0
1916 NORTON, Brooklands Special, as new	£48	10
1916 ENFIELD, 180 Combination, used few miles	£76	10
7 h.p. 1916 INDIAN, Powerplus, and Sear, as new	£79	10

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**COACH** Bodies, latest; great sacrifice, 25/-; brand new.—Venus Sidecars Co., 746, Seven Sisters Rd., Tottenham. [3723]

**COACH** Bodies, 2-seaters, 1916 bargains, 70/-, direct from Venus Sidecar Factory, 746, Seven Sisters, Tottenham. [17309]

**COACH** Bodies made to any model; repairs, re-painting, re-upholstering; estimates free.—Venus Car Factory, Tottenham. [5594]

**SIDECAR** Bodies.—Coloured sketches of original designs and working drawings supplied; first-class work guaranteed.—Cooper's Vehicle Journal, Ltd., 19, Garrick St., Long Acre, London, W.O. Tel.: Gerrard 2425. [0818]

**250** Bodies always in stock. Practical 2-seater bodies, coach, cigar bodies, 87/6; cane ditto, 52/6; wicker cigar bodies, 40/-; lightweight coach bodies, underslung, beautifully finished, 55/-; featherweight bodies, 50/-.—G.K. Sidecar Co., Loreano St., Pentonville Rd., London, W.C. [7503]

## RUNABOUTS AND CYCLE CARS.

**CHASSIS**, 3-wheel, with tyres, worm drive back wheel; £3/10.—169a, Lower Clapton Rd., N.E. [X2717]

**MORGAN**, July, 1915, sporting, done 3,000, practically new condition; £85, near offers.—48, Woodfield Rd., Ealing. [7369]

**CYCLE** Car Chassis, underslung, complete with 2-speed gear and brakes; £7/10.—169a, Lower Clapton Rd., N.E. [X2716]

**1915** Morgan Runabout, sporting model, fitted with M.A.G. twin-cyl. engine, disc wheels, lamps, and Klaxon hooter; £85.—Vauchope's, 9, Shoe Lane, London. [7457]

**10 h.p.** De Dion Engine Cycle Car (Treasury rating 6 2-5 h.p.), 2-seater, belt drive, variable pullers, very fast, in good condition; £39.—Apply, S. Coleman, 54, Sandwell Rd., West Bromwich. [7282]

**SMART** Little Cycle Car, single, 2-stroke, mag., Car-den, 60 m.p.g., brass lamps, horn, etc.; £35, or exchange 2-cyl. or modern combination, cash adjustment.—C.W.L., 351, North End Rd., Fulham. [X2628]

## CARS FOR SALE.

**SINGER** 10h.p. Light Car, 1913, real little gem; £130; trial.—Buckingham, Tindal St., Chelmsford. [6983]

**TRUMBULL** 13.2h.p. Light Car, brand new, late 1915 model; special reduced price, £125.—Crow Bros., Guildford. [7115]

**£15**—Darracq, 10-12h.p., 2-cyl., screen, and mag., make van, exchange second-hand cycles.—Bevington, Herts. [X2609]

**TRUMBULL** Light 2-seater Car, new, list price, £155; accept £115; complete, electric horn, lamp, spare wheel and tyre, tools.—21, Tindal St., Chelmsford. [6982]

**ARGYLE** 12-14h.p. Chassis, Aster engine, Solex carburettor, coil ignition, just off road; bargain, £12/10, offers; room wanted.—Apply, 2-6 any evening, Fish-Skins, Barbours Rd., Bow Bridge, Stratford, London. [7526]

**BARGAINS**. Absolutely must clear.—10h.p. Adams, 2-seater, mag., £25; 8h.p. Darracq van, £25; 6 h.p. Rover, 2-seater, mag., side change, £35; 6h.p. Gordon, streamline 2-seater, mag., Solex, £35; Cyclone cycle car, £35; Jackson sporting 2-seater, £45; 10h.p. 1910 Adams, 4-seater, £45; De Dion 15 cwt. van, solids, £65; 1914 Humberette, £85; 8h.p. 1913 cycle car, 4-cyl. Monobloc, enclosed valves, £90; 12-15h.p. ultra sporting boat-shape torpedo, 4-seater, £95; 12h.p. Rover, sporting streamline 2-seater, 4-cyl. monobloc, enclosed valves, disc wheels, £125; 14h.p. Sheffield-Simplex sporting coupe, £135; 15h.p. Standard torpedo, £145; 12-15 h.p. F.I.A.T. torpedo, 4 speeds, £165; several other cars, £25 to £385; absolutely must clear; what offers? Auction prices accepted; exchanges considered. Please call, hours 9 to 9.—Liquidator, 6c, Lansdowne Hill, West Norwood. [7376]

## EXTENDED PAYMENTS.

**EXTENDED** Payments.—All makes supplied; lowest terms.—Service Co., 292, High Holborn, London. [0618]

**INSURANCE**—Lloyd's motor policies payable monthly. Before insuring elsewhere write for prospectus.—Manager, General Insurance Co., 199, Piccadilly, London, W. [0810]

## ENGINES.

**PRECISION** Engine Repairs and Spares.—Grandex Motor Cycles, 86, Gray's Inn Rd., W.C. [X2107]

**ENGINE**, 7h.p., 2-cyl., water-cooled, with clutch; £7/10.—169a, Lower Clapton Rd., N.E. [X2720]

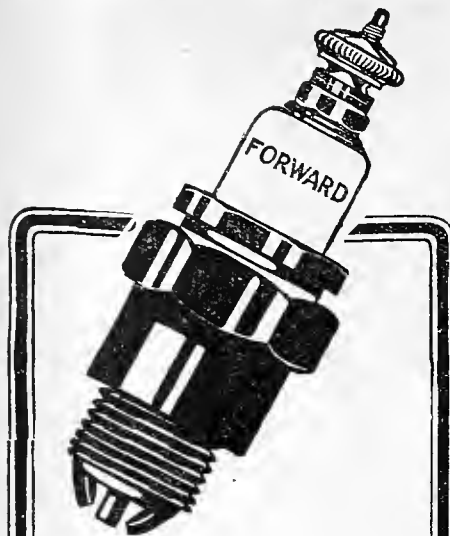
**8 h.p.** Aster, single, water-cooled, splendid for stationery plant; bargain, £4/10.—Banting, Harrow. [7499]

**4 h.p.** Antoine, mag., adjustable pulley; £6; stamp, reply.—Hart, 27, Walpole Rd., New Cross, S.E. [7382]

**3 1/2 h.p.** Engine, Bosch mag., Brown and Barlow carburettor; £7/10.—Tom Woodman, Peterborough. [X2750]

**PETROL** Engine for sale, 2-cyl., 10-12h.p. Darracq, magneto, suit boat or picture house plant; £12.—McCrindle, 11a, Princess St., Kilmarnock. [X2547]

**4 h.p.** Precisio Twin Engine, as new, done little running, complete with induction pipe and magneto hanger; accept £10.—Dene Motor Cycle Co., Haymarket, Newcastle-on-Tyne. [X2004]



“—just the goods for the two-stroke”

thus “Ixon,” in “The Motor Cycle” last week, describes the FORWARD (Type D).

Explaining that after having to discard over £5 worth of Plugs on account of their “business ends” being “extremely foul,” “Ixon” says—

“I am now using a FORWARD Plug which has a detachable insulator . . . it seems to be just the goods for two-strokes, which soil their plugs so quickly.”

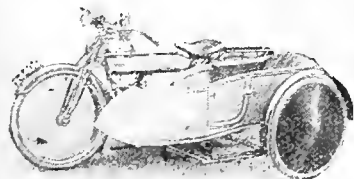
Type D, illustrated above, is the plug referred to. It can readily be taken apart for cleaning. Price 3/-

**FORWARD**

MOTOR COMPANY,

55 Summer Row, BIRMINGHAM.

#### GROSVENOR SIDECARS.



No. 7, Sporting Model Lightweight Sidecar, specially designed for racing, or for use with Douglas and other lightweight machines.

Standard Model. Price complete, £9 15 0. Special Model. With side door and apron, £10 10 0.

Catalogue free.

The GROSVENOR MOTOR CO.

Phone, 1571. Bradford Street West, BOLTON.

#### ENGINES.

BRITON Engine, 10-12h.p., 2-cyl., water-cooled, complete with Bosch mag., carburetter, flywheel and clutch; £19.—Tuke and Bell, Ltd., Motor Dept., Carlton Engineering Works, High Rd., Tottenham, N. [6661]

J.A.P., 6h.p., mechanical valves, Bosch mag., and B. carburetter, complete, £12/10; Ilston, 8h.p., mechanical valves, overhead inlet, Bosch mag., and Amca carburetter, £14; 3½h.p. Minerva, 1½cylinder, £1; 4h.p. Roc cylinder, damaged, £1; Peca 2½h.p. 2-stroke, new, £6/10.—Firth, Woodbridge Rd., Moseley, Birmingham. [X2803]

#### IGNITION APPLIANCES.

PARKER and Rice, Magneto Specialists; experts on all magnetos, Bosch, Eisemann, etc.

PARKER and Rice.—Re-winding, re-magnetising, overhauling, etc.; repairs executed with expedition and unapproachable workmanship; low quotations.

IMPORTANT.—Parker and Rice give 12 months' written guarantee with each repair, and deliver magnetos to time.

PARKER and Rice have a large stock of spare parts for all makes and types of magnetos.

PARKER and Rice have some good new and second-hand magnetos for sale, which will be guaranteed for 12 months.

PARKER and Rice have taken over larger premises at Acton. Their address now is 75, Park Rd. North, Acton, London. Phone: Chiswick 1518. State your trouble. Let us quote you. [4605]

CLOCKWISE Magneto for sale, 50/-, or exchange for gear box, suit 3½h.p.—44, Perkins St., Coventry. [X2828]

SEND Your Magneto Repairs to the Runbaken Magneto Co., Ltd., Camp St., Works, Deansgate, Manchester. Phone: 8266 City (3 lines). T.A.: Runmag, Manchester.

REPAIRS.—The Runbaken Magneto Co., Ltd., have the largest and best equipped works in this country for dealing with this class of work. Moderate charges. Car return within 24 hours.

SPARKS Department.—We can supply from stock all spare parts for Bosch, Eisemann, Mea, U.H., etc. Send for illustrated booklet.

THE Runbaken Magneto Co., Ltd., Camp St. Works, Deansgate, Manchester. Phone: 8266 City (3 lines). T.A.: Runmag, Manchester. Call or write. [0404]

MAGNETO Repairs and all spare parts.—The Runbaken Magneto Co., Ltd., Camp St. Works, Deansgate, Manchester. Tel.: 8266 City (3 lines). T.A.: Runmag, Manchester. [0715]

JEBRON, registered 291298, greatly superior to platinum, unequalled for blades, screws, etc.; cures misfiring; 3/6 each rivet; Jebron screws, fit Bosch magentos, 8/- pair; old screws Jebronised, 3/6 each.

JEBRON Contacts, used by Messrs. Collier Bros., Colver, Martin, making world's records.—Jebron, 58, Herbert Rd., Woolwich, London, S.E. [X4331]

MAGNETO Repairs of Every Description. We have had some years' experience with the Bosch Co., and are entirely British, and give same guarantee at half their prices in 24 hours. We stock all spare parts, also new and second-hand magnetos.—The Magneto Repairing and Winding Co., 158, Seymour St., Euston, London. Phone: Museum 1158. [7547]

#### TANKS.

TANKS.—Tanks any shape to order, repaired, or enamelled; all-metal sidecar bodies; general sheet metal work; lists free.—Attwoods, 86, Rosebery Av., E.C. Tel.: Central 12445. [5591]

#### TYRES.

TYRES.—See our Bancroftian advertisement, under Miscellaneous. [0766]

BASTONE'S.—Presents free a 3s. repair outfit to purchasers of Goodyear, Henley, Peter Union, and Michelin clearance covers, as below:

BASTONE'S.—Goodyear heavy rubber-studded covers, B.E., 26x2¼, 21/-, list 32/6.

BASTONE'S.—Henley rubber-studded covers, 26x2, 14/-, list price 30/-; 26x2¼, 16/-, list 32/-; 26x2½, 18/-, list 33/-.

BASTONE'S.—Michelin standard heavy covers, 26x2, 16/6, list 29/-; 26x2½ or 650x65, 19/6, list 36/6.

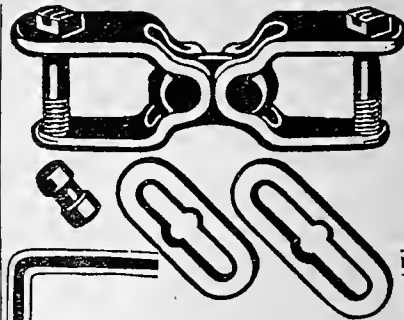
BASTONE'S.—Peter Union twin-ribbed heavy covers, 26x2, 19/6, list 29/3; 26x2½, 26/6, list 34/3.

BASTONE'S.—Guaranteed red tubes, 26x2, 4/6; 26x2¼, 4/9; 26x2½, 6/-; 26x3, 7/6.

BASTONE'S.—New 1916 Michelin covers (not clearance), banded, 26x1½, 11/6, 26x2 14/9, 26x2¼ 16/-, 26x2½ 18/-, 28x2 16/6, 28x2¼ 17/-; also wired edge in stock.

BASTONE'S, 228, Pentonville Rd., King's Cross, London, N. Close 6.30 o'clock, 1 o'clock Sat. days. [6225]

EXCEPTIONAL Offer for month only, in order to advertise British made motor tyres and belts, absolutely new, direct from works, with makers' guarantee. We will supply any size tyre or tube at reduced prices. Agents wanted for Kumpel, the famous petrol substitutor.—Kemp's Rubber Works, Hardman St., Manchester. [7527]



## FORWARD Fasteners

bring and hold the ends of the belt close together.

Belt-end protectors — necessary with fasteners which fail in this respect — are not needed; hence, an outlay often equal to the cost of the fastener itself is entirely obviated.

Further, in bringing the ends close together the FORWARD ensures a greater length of belt beyond the rivets, thus avoiding the likelihood of strain and the consequent risk of the rivets pulking through.

The strongest fastener on the market — made in five sizes, 5in., 7in., 7½in., 1in., and 1½in. Price 1/6 each.

**FORWARD MOTOR CO.,**  
SUMMER ROW,  
BIRMINGHAM.

### Auto-Vac

PETROL ECONOMISER

Patent applied for.

**A SAVING OF 20%**

**1/9** Post free.

**MORE POWER. EASY STARTING.**

Full Particulars: Dept. A., GORDON MOTOR WORKS, ROYSTON, HERTS.

## TYRES.

**LEGGATE'S**, Edinburgh, for Tyre Value.

**LEGGATE'S**, Edinburgh.—For great reductions in brand new clearance tyres. See below for approval terms. Prompt despatch guaranteed.

**LEGGATE'S**, Edinburgh.—Clearance.—1916 new pattern Clincher Dreadnought, 6-ply fabric, extra heavy, rubber-studded, beaded covers, 26x2½ 51/-, list 22; 26x2½ to fit 2½ rims, 51/6, list 22; 26x2½ 32/6, list 22.

**LEGGATE'S**, Edinburgh.—Clearance.—1916 new pattern Clincher de luxe, heavy rubber-studded, beaded covers, 26x2 21/-, 26x2½ 21/-, 26x2½, to fit 2½ rims, 23/6, 26x2½ 25/6.

**LEGGATE'S**, Edinburgh.—Clearance.—1916 new Clincher de luxe, beaded edge, 4-ply fabric, special heavy, rubber-studded covers, 26x2½, for 2½ rims, 27/6, list 21/16/6. A customer writes: "I have covered over 8,500 miles on one of your extra heavy Clincher De Luxe tyres fitted on my Triumph. It is the best value I have ever struck."

**LEGGATE'S**, Edinburgh.—Standard 1916 Clincher Dreadnought, 3-ribbed, 6-ply fabric, beaded covers, 650x65 39/3, 700x80 44/9, 700x80 for 650x65 rims 44/9; specially made for voiturette rims of extra powerful passenger outfits and light cars. A customer writes: "Your 700x80, for 650x65 rims, is truly marvellous value."

**LEGGATE'S**, Edinburgh.—Standard 1916 Dunlop 4-ply, extra heavy, rubber-studded, beaded covers, 26x2½ 37/9, 26x2½ 39/-, 26x2½ for 2½ rims 40/-, 26x3 for 2½ rims 40/9, 650x65 41/-.

**LEGGATE'S**, Edinburgh.—Clearance.—1916 extra heavy, 4-ply, rubber-studded, beaded covers, 28x2½ (for Indians) 31/-, list 41/3; 28x3 (for Indians of Harley-Davidsons) 33/-, list 44/-.

**LEGGATE'S**, Edinburgh.—1916 Dunlop tubes, best quality, extra heavy, fully guaranteed, 24x2 6/6, 24x2½ 7/-, 26x1½ 6/6, 26x2 6/9, 26x2½ 7/9, 26x2½ 8/6, 26x2½ 8/9, 26x3 9/6, 650x65 10/6, 28x2½ 9/-, 28x3 10/6.

**LEGGATE'S**, Edinburgh.—These goods are all brand new, and sent anywhere on 7 days' approval against remittance, cash refunded in full if goods not approved of.

**LEGGATE and Co.**, Motor Cycle Specialists, 15, Slatford Rd., Edinburgh. 'Phone: Central 8693. [X2688]

**ECONOMIC**.—Free. We present where stated below a fully guaranteed Simms plug.

**ECONOMIC**.—Commercial users note. We are prepared to quote special terms for business purposes. Send requirements.

**ECONOMIC**.—Kempshall clearance non-skids, 26x2½ 30/-, specials 32/6, 26x2½ 35/-, 26x2½ 40/-, 26x3 for 650x65 52/-, including plug.

**ECONOMIC**.—Kempshall clearance deepened tread 26x2½ anti-skids, 23/-; special for Douglases and 26x2 rims, including plug.

**ECONOMIC**.—Kempshall clearance anti-skids, 26x2 18/-, 26x2½ oversize 25/-, 26x2½ 27/-, 28x2½ 27/-, 28x3 30/-, including plug.

**ECONOMIC**.—Kempshall 28x2½, 2½ special racing cover, for Indians, 25/-; as used in the T.T. races.

**ECONOMIC**.—Clincher 24x2 heavy 4-ply De Luxe, 17/6; 26x2½, 2½, 6-ply Dreadnoughts, shop-soled only, 37/6.

**ECONOMIC**.—Continental 26x2½, wired, oversize for 26x2, 10/6; heavy studded ditto, 17/6.

**ECONOMIC**.—Continental Model de Course, 26x2½, 2½, oversize, 23/-, listed 35/-; including plug.

**ECONOMIC**.—Large numbers of odd 26x2½ and 26x2½ covers from 7/6 to 17/6 to clear.

**ECONOMIC**.—Continental 26x2½ steel stud combinations, 36/-; basket pattern, 26x2 15/-, 26x2½ 16/-, 26x2½ 17/6.

**ECONOMIC**.—Special clearance of 26x2½ Wood-Milne covers; special rubber-studded 20/-, listed 31/6; special grip-ribbed, 25/-, listed 39/-, including plug.

**ECONOMIC**.—Wood-Milne 28x2½, Grip-ribbed specials 16/6, listed 31/9, extra heavy 21/-, listed 39/-; including plug.

**ECONOMIC**.—Wood-Milne 26x2½, 2½, oversize for 26x2½, rubber-studded special 22/6, listed 32/9; extra heavy Grip-ribbed 27/6, listed 40/-; including plug.

**ECONOMIC**.—Wood-Milne, 28x3, for Indians, heavy grip-ribbed 30/-, heavy grooved 30/-.

**ECONOMIC**.—Avon 26x2 Druids 15/-, 26x2½ Invicta 16/-, 26x2½ triear 25/-, 26x2½ 27/6; free plug with triear.

**ECONOMIC**.—Tubes, fully guaranteed, not clearance, 26x2½ 7/6, 26x2½ 8/6, 26x2½ 9/6; Continental 28x2½, 2½, 7/6, 650x65 6/-; Clincher, 24x2 3/6.

**ECONOMIC**.—Enfield riders note. Continental, 650x65, 27/6; special for driving wheels.

**ECONOMIC**.—Pedley Belts, latest pattern, fully guaranteed, ½ in. 1/5, ¾ in. 1/8, 1 in. 1/11, 1½ allowance for old belts.

**ECONOMIC**.—Clincher Flexis belting, 8ft. 6in. 1½ in. 1/6, 7ft. and 7ft. 4in. 1½ in. 1/3, Continental ¾ in. 1/-, fastener free.

**ECONOMIC Tyre Co.**, 137, Lewisham High Rd., New Cross. 'Phone: New Cross 1393. Open till 9. [X7316]

## YORKSHIRE'S

**HODGSON**  
10, HORTON RD.  
BRADFORD.  
TELEP. 5361

MOTOR CYCLE DEALER.

NOTE THIS PRICE  
**£35**

It is the actual value of a motor cycle which I am offering for sale. The price will be reduced £2 10s. per week until sold. First cheque received in any one week secures the bargain, and the machine will be sent on appro. for two clear days, and can be returned if not as stated.

The machine is as follows:—

**ENFIELD** 3 h.p. twin, 1913, two-speed gear, all chain drive, mechanical lubrication, tyres good, appearance, plating, and enamelling good; thoroughly overhauled and all mechanically sound, ready to ride anywhere.

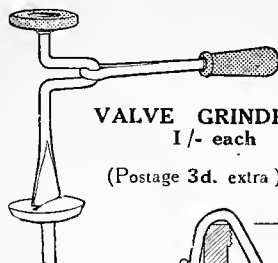
NEXT WEEK'S PRICE  
**£30 - 0 - 0**

## NO MORE

## 'Valve Trouble'

AN INDISPENSABLE ADDITION TO  
YOUR TOOL KIT.

From all Agents and Factors, or  
direct from Manufacturers:



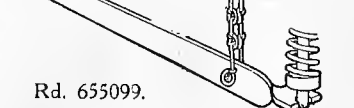
VALVE GRINDER,  
1/- each

(Postage 3d. extra.)

Pat. 2577/16.

VALVE REMOVER, 1/- each.

(Postage 3d. extra.)



Rd. 655099.

**A. T. AUSTIN & CO.,**  
339, High St., Stirchley, Birmingham.

## TYRES.

**7/6** Allowance Guaranteed for old tyre towards nearly all new motor cycle covers.—Particulars to Taylors'. Tyre Stockists, Store St., London, W.C. [0626]

## PATENT AGENTS.

**HENRY SKERRETT**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs. Motor patents a speciality. [0636]

## GARAGES.

**STORAGE**.—Owing to our taking over five additional premises as extensions to this garage, we are now able to store motors, not in use, at the following nominal charges: Motor cycles, 1/- per month; motor cycles and sidecars, 2/- per month; 3-wheeled cycle cars, 3/- per month; light cars (short wheelbase), 5/- per month; Ford cars 7/- per month, motor cars 10/- per month. For landaulets and extra long wheelbase cars there is a slightly higher charge.—Messrs. Green Taxis, Villiers Street Garage, Charing Cross, London. [6916]

## INSURANCE.

**FOR** Insurance of all kinds (especially motor), apply, Ernest J. Bass, Insurance Broker, Bishops Stortford. [0693]

**WHY** Pay Your Insurance Premium a year in advance when you can pay monthly without extra cost? Lowest rates for motor cycles. Before insuring elsewhere write for prospectus of Lloyd's Motor Policies payable monthly.—Manager, General Insurance Co., 199, Piccadilly, London, W. [7754]

## SITUATIONS VACANT.

**WANTED**, motor and motor cycle mechanics; good work need apply.—Apply nearest Labour Exchange, quoting No. A1959. [0819]

**PATTERN** Makers (wood) required for immediate Government work. Experience of high-class petrol motor work an advantage. Good wages and prospects, war bonus, and overtime. No man on Government work can be engaged.—Write, or apply in first instance to your nearest Board of Trade Labour Exchange, mentioning this paper and No. A2016. [7502]

## LOST AND FOUND.

**LOST**, May 6th, from motor cycle, about 10 miles east Basingstoke, London Road, small leather suit case containing officer's khaki slacks, other clothing, and two pocket Kodaks. Reward to finder returning to Whitaker, Insurance Commission, Buckingham Gate, W. [7311]

## TUITION.

**HOW** to Use Paraffin. Careful individual instructions. A course of lessons.—Jackson Bros., Maze, Hillsborough. [7418]

**LESSONS** in Sidecar Driving on P. and M., ladies and gentlemen; also for hire.—41, Ashford Rd., Cricklewood. [7415]

**RIDER TROWARD** can accept several more pupils for tuition; fee, £1 for 5 lessons.—78, High St., Hampstead. 'Phone: 5392. [7407]

## AUCTION SALES.

**WE** May Not go in sixpenny three farthing bargain sales, but we can place your motor in auction sale on commission basis.—Messrs. Green Taxis, Villiers Street Garage, Charing Cross, London. [6914]

## WANTED.

**WANTED**, Roc gear.—No. 359, c/o The Motor Cycle. [X2548]

**GOOD** Magneto, for 2-hp. single F.N.—Walley, Rosethorne, Knutsford. [X2686]

**ENFIELD** Luggage Grid, for combination.—Binder, Weldon, Kettering. [X2680]

**3 1/2** h.p. 3-speed Norton, Sunbeam, Triumph; cheap.—Else, Derwent Mill, Matlock. [X2682]

**DOUGLASES**, 1912-16, spring forks for big twin.—Troward, 78, High St., Hampstead. [7408]

**SPEEDOMETER**, magneto, and Sturmer-Archer gear, for cash.—64, Staines Rd., Hounslow. [X2795]

**100** Motor Cycles Wanted; spot cash paid.—Bring or send, Palmer's Garage, Tooting. [7475]

**PHILLIPSON** Pulley, good as new, suit 1911 Triumph.—Oliver, Liberton House, Midlothian. [X2552]

**SWAN** Sporting Sidecar or Sporting Canelet wanted.—C. White, Warren Farm, Guildford. [7394]

**WANTED**, gear, fit Triumph, new, unused; 45/-.—Clonette, 44, Kilmarin Av., Norbury. [7286]

**BOSCH** DA2 or ZE1 wanted, also N.S.U. gear, cheap, cash.—Box L1,673, c/o The Motor Cycle. [7556]

**MODERN** 2-stroke, cheap for cash.—Wyll Ingham, 26, Co-operative St., Haslingden, Lancs. [7283]

**RADIATOR** wanted, for w.c. motor cycle.—Ratcliffe, Appleby Lodge, Rusholme, Manchester. [X2678]

**WANTED**, motor cycle, cheap for cash.—W.M., c/o 392, Coldharbour Lane, Brixton, S.W. [7419]

**WANTED**, motor cycle, with or without sidecar; cash.—Homestead, Hayes End, Middx. [7426]



## WANTED.

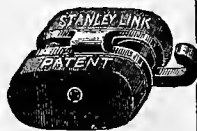
- WANTED, cam wheel, m.o.v., Fafair 3½ h.p.—Deacon, Sydenham Hill, Cotham, Bristol. [7520]
- WANTED, good lightweight, must be in perfect order.—Reply to Box L1,646, c/o *The Motor Cycle*. [7274]
- WANTED, A.J.S. motors, 2½ h.p. and 6 h.p.; half profit to secure.—Cross, Agent, Rotherham. [X2731]
- WANTED, motor cycle, any condition if cheap.—Grove, 224, Fore St., Upper Edmonton, London. [7391]
- DETACHABLE Spare Wheel, for 4 h.p. A.J.S. 1915 combination.—Jameson, Kenton, Northumberland. [X2646]
- WANTED, sidecar, suitable for Harley-Davidson.—Hastehurst, Elphinstone Barracks, Plymouth. [X2463]
- WANTED, lightweight spring forks: Bowden magneto control, 5/—Brown, Colonial Rd., Slough. [X2714]
- WANTED, featherweight sidecar, good condition, quick detachable.—Campbell, 16, Main St., Stroud. [X2713]
- WILLIAMSON Motor Bicycles and Combinations purchased for cash.—Williamson Motors, Coventry. [X1707]
- £20 offered for motor cycle or combination; send fullest particulars.—Box L1,683, c/o *The Motor Cycle*. [7552]
- WANTED, Indian Combination, 1915-16; private buyer, no dealers.—Brookside Cottage, Bath Rd., Slough. [7524]
- WANTED, cylinder for 2½ h.p. Precision, good order; cheap.—Dunlop and Co., Gresham St., Belfast. [X2826]
- WANTED, enquiries from commercial users; special quotations. See advertisement Tyres column, Economic. [7319]
- WANTED, Douglas, Triumph, or 2-speed lightweight.—Full particulars, West, Starlings Motories, North Walsham. [6645]
- WANTED, motor cycle, with or without sidecar, exchange freehold land.—99, Montague Rd., Leytonstone. [X2626]
- WANTED, 1910 P. and M. cylinder and piston, new or good second-hand.—Syd. Thomas, Plumber, Cardigan. [X2761]
- NEW Imperial-Jap wanted, not later 1914, particulars for cash; also small lathe.—Barnett, West St., Farnham. [7266]
- COMBINATION, modern clutch model preferred; price moderate; letters only.—Woodcraft, 26, Methley St., Kennington. [7337]
- WANTED, N.S.U. 2-speed gear for Triumph, lamp set, mechanical horn; approval, deposit.—Cooke, 69, Southend, Croydon. [X2694]
- MOTOR Cycle, not earlier than 1914, 4 h.p. (upwards), countershaft gear.—Stonehouse, c/o Sibthorpe, Raphael Park, Romford. [7316]
- SECOND-HAND Motor Cycles, purchased for cash. Send particulars and lowest prices.—Service Co., 292, High Holborn, W.C. [0679]
- NORTON, 1913-1914, countershaft geared, or Douglas, for spot cash; no dealers; what offers?—Lewis, 9, Orsett Rd., Grays, Essex. [7281]
- GOOD Make Roomy Coachbuilt Sidecar, in first-class condition, suit 4½ h.p. B.S.A.—F. W. Marriott, Market Sq., Wellington. [X2640]
- WANTED, 3-speed wheel for 6 h.p., 26×2½ rim, 7½ in. between bottom stays, controls, approval.—Gelder, Longmarton, Carlisle. [X2738]
- WANTED, Flywheel and Clutch off old Wolsley 8 or 12 h.p. car; also chain and gear box sprocket.—Nixon, Brampton, Cumberland. [X2771]
- WANTED, for spot cash, Triumphs, Douglases, B.S.A.'s, Royal Enfield, and others.—Wanchepet, 9, Shoe Lane, London. [7463]
- MAGNETOS wanted, especially Dixies, second-hand, any condition, for cash; best prices given.—Parrie, 13, Hardwick Rd., Chiswick, W. [7338]
- WANTED, 2 h.p. Humber, Centaur, or lightweight, condition immaterial, very cheap.—William Jennings, Bezeat, Wellington. [7384]
- MOTOR Cycle and sidecar wanted, all latest improvements: Ariel, 1914, 3½ h.p., for preference.—Waggett, Pipers End, Harpenden. [7258]
- WANTED, 2-stroke, cash or exchange 3 h.p. White and Poppe, mag., Senspray, cash adjustment.—Butlin, 116, Fortess Rd., Kentish Town. [X2663]
- GOOD Allowance for your present machine against new model; send particulars.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [7303]
- WANTED, 1914-15 3-speed 4½ h.p. Triumph, B.S.A., or Japco, also sporting C.B. sidecar.—Clonette, 44, Kilmartin Av., Norbury. [7287]
- DOUGLAS, 1915-16, T.T., 3-speed, or W.D., or 4 h.p. A model, new condition; cash.—Wright, E., 14, Fairfax Rd., Hampton Wick, Middlesex. [7289]
- 6 h.p. Enfield, New Hudson, Sparkbrook, or Sunbeam combination, 1916, cash or new Royal Ruby, 2½ h.p. J.A.P., part exchange.—Jackson, Agent, Lyth, Westmorland. [X2629]

OUR  
WEEK-BY-WEEK

TALKS ON

B E L T  
D R I V EJUNE  
29.

ONCE AGAIN we beg leave to draw attention to a little filament that gives big results in added efficiency, increased speed, and longer wear of the belt. Every rider knows the familiar "click" made by the belt fastener as it passes over the engine pulley: it indicates wear on both, whilst the belt ends suffer from being insufficiently supported. These troubles can be cured by fitting a

STANLEY  
"SPARE  
LINK."

Try it yourself; it costs but 1/-, which will be saved over and over again in longer wear of belt, of fastener, and of engine pulley, as well as in the increased freedom from trouble. The illustration shows it in use.



As supplied to the British and Allied Armies.

"LION" Fastener, Guaranteed  
5,000 Miles . . . . . 6d.

Stanley Fastener, The ORIGINAL . . . . . 9d.

Stanley "Shield" . . . . . 8d.

Stanley "Adjusting Hooks" . . . . . 6d. for 3

Stanley Belt . . . . . 1/3 to 2/5 per foot.

(A Stanley Fastener given free with each Belt.)

10% increase on Belting only.

Two interesting booklets sent on request by postcard.

STANLEY MOTOR BELT  
& FASTENER CO.

(Inventors of the Original Hook  
Fastener and other  
practical Belt Aids).

(C. Webb, Manager).

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Ruffy-Baumann School  
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London Aerodrome,  
Hendon, N.W.

'Phone:

151,  
Kingsbury.

Write

Dept. B,

Ruffy-Baumann

School of Flying,

Kendall's Mews,

Portman Square, W.

'Phone: 5046 Mayfair.

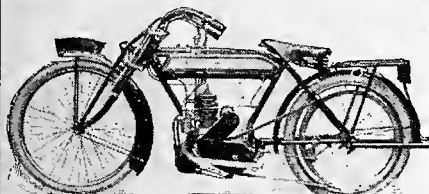
LEARN TO FLY

## WANTED.

- WANTED, lightweight Douglas or Triumph, in exchange for 3½ h.p. Brown, fully equipped, T.T.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [7304]
- HARLEY-DAVIDSON, Sunbeam, Zenith combination; exchange Zenith standard, Canelet sidecar, and cash.—Palmer, No. 7 Camp, Windmill Hill, Andover. [X2679]
- MOTOR Cycles, combinations, light cars, bought for cash and sold on commission.—Morgan and Maxwell, The London Motor Mart, 80, High Rd., Streatham. [X2560]
- SUNBEAM, 2½ h.p., handle-bar clutch, good condition essential, or Douglas, 2½ h.p., not later 1914.—Price and full particulars District Surveyor, Romsey, Hampshire. [X2550]
- WANTED, good second-hand lamps, horns, speedometers, and other modern accessories.—Particulars and lowest price for cash, Service Co., 292, High Holborn, W.C. [0743]
- WE Have no bargain basement, but we will sell your motor for you on quite reasonable terms.—Messrs. Green Taxis, Villiers Street Garage, Charing Cross, London. [6915]
- RIDER TROWARD can accept several high-class machines for sale at 5% commission in his new showrooms, 78, High St., Hampstead. 'Phone: 5392. Collected, insured, garaged, advertised free. [7406]
- 2½ h.p. M.O.V. Minerva Cylinder, also motor cycle, 24 any condition; for sale, Zenith-Gradua, 8 h.p. J.A.P., equal new, bargain, £35, exchange lower power and cash.—Chalkley, 31, Carlton Rd., New Southgate. [7414]
- WANTED.—Advertiser will pay good price for a 1914 or 1915 Douglas, must be in good condition; also modern combination, Enfield, A.J.S., or B.S.A. preferred; no dealers.—Box L1,671, c/o *The Motor Cycle*. [7315]
- GEO. SMITH, 268, Lavender Hill, Clapham Junction, buyers of motor cycles, combinations, sidecars, speedometers, lamps, etc., for cash; write, bring, or send; good prices paid. 'Phone: Battersea 1271. [7140]
- WANTED, either model F or G Pufferplus Indian, model G without sidecar, model F dynamo magneto, or otherwise, but with Indian sidecar; state mileage and lowest rock-bottom cash price.—Horswill, 103, Brook St., Chester. [7542]
- WANTED, Bowden, Armstrong, Albion, N.S.U., Sturmer, or any good make of gear, also magneto, carburettors, engines, frames, forks, tyres, or any motor parts, also Sturmer and Armstrong hub gear parts.—Pirith, Woodbridge Rd., Moseley, Birmingham. [7211]
- WANTED, back part Zenith frame, also Triumph, Douglas frames, tanks, wheels, clutches, gear boxes, Sturmer gears, engines, magneto and parts, lamps, speedometers, surplus stock, motor cycles, damaged or otherwise, cycle cars, cars.—Grove, 224, Fore St., Upper Edmonton, London. [7392]
- SEND Your Motor Cycle to Palmer's Garage, Tooting, Wimbledon Station, L. and S.W. Railway, per goods or Tooting Junction passenger train. Cash offer will be telegraphed immediately on receipt of machine. Machine can be included in fortnightly auction without charge if offer not accepted. Reserve price may be fixed.—Sole address, Palmer's Garage and Motor Cycle Auction Rooms, 183, 185, 187, 189, High St., Tooting. [7476]
- EXCHANGE.
- 1914 Cardea Monocar for sole mount, or sell.—19, Glen Rd., Sheffield. [X2780]
- 8 h.p. Chater-Jap, No. 7, large sidecar, for A.C. or similar, sell £45.—Pearse, Staplehurst. [X2802]
- EXCHANGE Absolutely New Upright Piano (36 gns.) for lightweight, Douglas preferred.—Drayton, Wells. [7273]
- EXCHANGE £20 Cabinet Gramophone and cash for good motor cycle.—30, Canterbury Rd., Kilburn. [7345]
- TWIN Lightweight, like new, for lathe.—66, Lawford, New Bilton, Rugby. Any offers entertained. [X2715]
- NEW £32 Piano or Furniture for motor cycle and cash, no rubbish.—F. Hirst, Parkhead, Holmthorpe. [X2770]
- 8 h.p. Swift, 2-seater, first-rate condition, for good cycle and sidecar.—121, St. James's Rd., Tunbridge Wells. [X2608]
- 6 h.p. Rex, perfect, less front piston; 26, or exchange 3½ h.p.—19, Ashbourne Grove, Lordship Lane, E. Dulwich. [7334]
- WANTED, good combination, in exchange, or motor cycle. See under Curs.—Liquidator, West Norwood. [7378]
- INDIAN, 5 h.p., 3-speed, 6 months old, condition as new; exchange T.T. Douglas.—Wilkinson, Bootmaker, Herne Bay. [7290]
- EXCHANGE.—Any make of motor cycle taken in part exchange for light cars.—Service Co., Featherstone Buildings, W.C. [0664]
- 1914 3½ h.p. Humber and Sidecar for 6 h.p. combination, A.J.S., Hazlewood, Enfield preferred.—15, Dorset Rd., Wimbledon. [7367]
- COMMERCIAL Users.—In exchange for a P.C. we quote you special prices. See advertisement in Tyres column.—Economic. [7320]

1916

# THE GRAND- PRECISION 2 $\frac{3}{4}$ h.p. Two-Stroke



A MACHINE OF PROVED MERIT AND  
HIGHEST VALUE.

FITTED WITH THE LATEST  
**ALBION Two-speed Gear.**

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Ready for Delivery.

AGENTS WANTED WHERE UNREPRESENTED.

**GRANDEX MOTORCYCLES,**  
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Sole London and District Agents for—

**NORTON,  
ARNO, and  
OMEGA  
Motor Cycles.**

### SECOND-HAND.

1914 ROVER, 3 $\frac{1}{2}$ h.p., T.T.	£38	0	0
1914 ENFIELD, 3 h.p., 2-speed .. ..	42	0	0
1913 DOUGLAS, 2-speed	32	0	0
1913 TRIUMPH, F.E., and Philipson .. ..	35	0	0

### LIGHT CARS.

1914 SINGER, Dynamo ..	£180	0	0
1914 LA PONETTE, as new. Cost over £300..	200	0	0
1914 LAGONDA Coupé	125	0	0

**74, Gt. Portland St.,  
London, W.**

'Phone: 943 Mayfair.

### EXCHANGE.

**EXCHANGE** Bat-Jap (see Bat advert), value £38, for cycle car or 3 $\frac{1}{2}$ h.p. combination.—Ideal Cycle Co., Thundersley, Essex. [7362]

**PATHE-FRERES** Gramophone, cost £4/13, as new, 40 latest records; exchange anything motorish.—64, Staines Rd., Hounslow. [X2796]

**NORTON** Big 4 Combination, 3in. tyres, all on, for powerful twin sporting combination, or cycle car.—Lieut. Morris, R.E., Dunstable. [X2457]

**3 $\frac{1}{2}$ h.p. Twin 2-speed** Motosacoché, Stewart, light coach—2 built Birsu sidecar, for good single, Norton 4 preferred, sell £50.—Gash, Tailor, Boston. [X2627]

**DALM** 2 $\frac{1}{2}$ h.p. 2-stroke Unit, complete, magneto, carburettor, etc., unused, for higher power: sell £14.—Spink, 28, Winfrith Rd., Earlsfield, S.W. [7285]

**EXCHANGE** Combination Ridge, 3 $\frac{1}{2}$ h.p., clutch, and coachbuilt sidecar, for higher power.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [7302]

**REX** 6h.p. Combination, new July, 1915, 2-speed, R handle starting, speedometer registers 1,400; sell £45, or exchange B.S.A.—Chequer, Brinkworth. [X2638]

**LATE 1912 2h.p. Rex-Jap** Combination, 2 speeds and free, 3 new tyres, new belt, overhauled; £40, for lightweight and cash.—Walton, Dawson Sq., Burnley. [X2675]

**EXCHANGE** 1913 5-seater Ford, all accessories, just overhauled, condition perfect, for combination and cash, or sell £65.—7, Knighton Rd., Forest Gate, London. [7525]

**EXCHANGE** 1913 8h.p. Matchless combination, 2-speed, twin belt, perfect condition, for modern 3 $\frac{1}{2}$ h.p. and cash, or sell £55.—Parker, High St., Mablethorpe. [7255]

**3 $\frac{1}{2}$ h.p. Minerva**, Mabon clutch, U.H. mag., Druids, B. and B., and cash up to £5 for speed gear machine, sell £12.—A. Maxwell, 4, Cambridge Place, Kilburn. [7358]

**EXCHANGE** 3 $\frac{1}{2}$ h.p. Brown, fully equipped, unscratched, T.T. model, for lightweight, Douglas preferred.—W. and H. Motor Co., Ltd., 287, Deansgate, Manchester. [7301]

**SIZAIRE**, 8h.p., sporting 2-seater, mag., screen, lamps, speedometer, full accessories, in exchange for real good combination, or £50.—14, Dodbrooke Rd., West Norwood. [7514]

**EXCHANGE** Powerful Magneto Motor Cycle, free engine, 2 speeds, and sidecar, for gent's 3-speed cycle and cash, or level exchange good piano.—170, Cape Hill, Smethwick. [X2805]

**EXCHANGE** for good motor cycle, pianola, Metrostyle (The Orchestral Co.) and rolls, cost over £60; seen by appointment.—Heron, 12, St. Alban's Rd., Highgate Rd., N.W. [7471]

### REPAIRERS.

**A.J.S. Specialist.**

**A.J.S. Repairs** are my speciality.—Youngs, 2 and 3, The Parade, High Rd., Kilburn. [3555]

**WHITTALL** Machinists' Co., War Office Contractors, for all engine repairs.

**WHITTALL**—Expert welders. Specialists in aluminium welding. Crank cases, cylinder flanges, valve seats, pistons, etc., promptly welded and machined.—Whittall Machinists' Co., Whittall St., Birmingham. [0136]

**VALVES**—Nickel steel valves, any size, 4/6; per pair, 8/6.—C. R. Foster, Kirkstall Rd., Leeds. [0253]

**ARMSTRONG** and Sturmy Repairs promptly and efficiently.—County Engineering Co., Hounslow. [X2667]

**ARMSTRONG** Gears Repaired, or parts supplied promptly.—The Rotary Jointing Co., Regent St., Warrington. [5312]

**F.N.** Cylinders Re-bored to increase power; replacement parts always in stock.—Earl, 5, Heath St., Hampstead. [7417]

**A.J.S. Official Repairs** and spare part stockists.—Sole London agents, Taylors, Ltd., Store St., W.C. Tel.: Museum 1240. [0779]

**WELDING** Experts.—Broken motor cylinders, aluminium crank cases, etc., welded and machined; nothing too difficult.—Below.

**TONQUE** Welding Works, 174, Oldham Rd., Middleton, Manchester. — Sound work; reasonable charges. [4523]

**FOR** First-class Guaranteed Repairs to all makes of motor cycles call on Walter Matthews, Motor Cycle Repair Expert, 117, Suffolk St., Birmingham. [0820]

**PLATING**, enamelling, tanks a speciality. Prices and particulars on application; write now.—Murray's Plating Works, Union St., Coventry. [X2777]

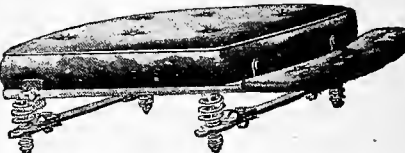
**FRAME** Repairs and Alteration.—Special frames and tanks built, any designs; enamelling and plating.—A. Pilkington and Co., 54, Aston Rd., Birmingham. [6607]

**PISTONS**, fitted with top and bottom step-cut rings, hardened steel gudgeon pin, and your cylinder re-bored and ground, 28/6.—C. R. Foster, Kirkstall Rd., Leeds. [0310]



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FROM **5/6** UPWARDS.  
DELIVERY FROM STOCK.

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The new Tynesider Carrier Seat folds up as shown above. Can be used for either passenger or fragile goods. A compact emergency seat. It is an ideal seat for light or heavy weights, sidecar combinations, and improves the appearance of the outfit. Mounted on a special spring attachment, it is self-balancing, absorbs road shocks, and adds to safety of carrier riding, while the spring rods work in guides on the principle of a piston—thus preventing sideways. All adjustable, and will fit any carrier. Price, complete with reversible cushion, 18/6; without the backrest, 12/6. Seat, complete with clips, but without springs or backrest, 5/6. Tynesider Bucket-shaped Pillion Seats, from 15/6 to 35/6. Children's, 14/6, with safety strap.

### THE LAST WORD in MOTOR CYCLE SEATS.



The essence of comfort is the Tynesider Bucket Seat. Low position, surpasses pan seats, beautifully sprung, no sidesway.

Can be detached and used as a Pillion seat. Cost less than a saddle. 21/- complete, with adjustable clip to fit Indian or any other cycle.

Without springs, 15/6. Better quality, 27/6. Superior quality, 36/6 complete.

Ask your dealer to get one for you.

**HENDERSON'S SEAT WORKS,**  
UNION STREET, NORTH SHIELDS, Eng.

**The PARAGON**  
PATENT  
**FOLDING  
SIDECAR**

When folded will pass  
through 30-inch doorway.

**SAVES STORAGE.**

**WINCYCLE TRADING CO., LIMITED,**  
106, Great Saffron Hill, London.

## ABSOLUTELY IN STOCK AT TIME OF GOING TO PRESS.

### HIGH-POWERED MACHINES.

1916 6 h.p. A.J.S., 3-speed, and Sidecar.....	£102 18
1916 INDIAN Powerplus & S'car	£96 0
1916 INDIAN, 5 h.p., 3-speed	£70 0
1916 ENFIELD, 6 h.p., & S'car	85 gns.

### MEDIUM-POWERED MACHINES.

1916 A.J.S., 4 h.p., 3-speed ..	£76 0
1916 B.S.A., 4½ h.p. ....	£62 0
1916 T.T. NORTON .....	52 gns.

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1916 NEW IMPERIAL-J.A.P., 2-speed.....	£38 0
1916 LEVIS Popular, 2-stroke	£32 0
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1915 2½ h.p. DOUGLAS, 3-sp.	42 gns.
1914 DOUGLAS, 2-speed ....	33 gns.
1914 CALTHORPE, 2-str., 2-sp.	18 gns.
1912 PREMIER, just overhauled, new tyres .....	17 gns.

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1916 MORGAN Sporting, complete.
1916 SINGER, 10 h.p., complete.
1913 HUMBERETTE, perfect.

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Biggest Motor Cycle & Light Car dealers in the South.  
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## N.S.U. TWO-SPEED GEARS

WITH FREE ENGINE AND ADJUSTABLE PULLEY.

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Supplied for practically every make of Belt-driven Motor Cycle.

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B.S.A.

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Bradbury



Rover

Rudge

3½ h.p. Precision

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Abingdon

Easy to fit. No alterations necessary. Specialists in repairs to these gears. Trade enquiries invited.

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HIGH STREET, ACTON,  
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### REPAIRERS.

SWIFT Cycle Co., Ltd., undertake the thorough repair and overhaul of any make of motor cycle at their large and well equipped repair works, 132-134, Long Acre, W.C. [5592]

ARMSTRONG and Sturmer-Archer Gears: all parts in stock. Repairs by experts; no waiting. Complete gears in stock.—Cromwell Engineering Co., Putney Bridge Rd., S.W. [3821]

MAGNETO Repairs—24 hours' service. All makes. Spare parts suitable for Bosch magnetos a speciality.—Simms Motor Units, Ltd., 191, Wardour St., London, W. T.A.: Stimotunit, London. [9746]

COMPRESSION.—Cylinders re-bored and ground, new piston, rings, and gudgeon, from 18/6; efficiency guaranteed.—Reliance Motor Engineering Co., Spon Lane, Smethwick, Birmingham. [4821]

THE Tennant Engineering Co., Pershore St., Birmingham, are engaged on war munitions, but can undertake motor repairs which come under Ministry of Munitions classifications A or B. Most commercial motors come under classification B. We can carry through any engine repairs in connection with them, but at present we cannot touch pleasure motors. In cylinder boring, piston fitting, bushing, or general overhauling, none can or will serve you better. Deliveries and work guaranteed. Official repairers to A.C.U. [X2807]

GEARS, Gears, Gears, Gears.—Sturmer-Archer, Armstrong, Douglas, P. and M., Williamson, B.S.A., Clyno, and all other motor cycle gears overhauled and parts supplied. To ensure prompt delivery we keep £1,000 worth of stock always in hand. Orders for abroad promptly despatched. Special concessions clients on service. Recommended by Sturmer-Archer, and all other leading firms for Complete gears for sale. Countershaft gears fitted and hub gears taken in part payment.—West London Motor Co., 165, Percy Rd., Shepherd's Bush, and 108, High St., Notting Hill Gate, London. [9744]

### MISCELLANEOUS.

#### A

1916 Catalogue, 180 pages, post free.—Accessories at lowest prices; cheapest house in the trade. Wind screens, 6 patterns, 19/6 to 32/6; Goodrich car tyres in stock. Sidecar chassis, 90/-; lamp brackets, 20 patterns; belt rims, various sizes, 6/-; 4in. mudguards, 3/3 pair; sidecar guards, 5/3; tyres, all makes, at lowest prices, spring seat pins, 6/6; kick-starters, 16/8; Walbro sidecar screens, 30/-; front stands, 4/-; oilskin clothing, black, brown, yellow, jackets from 6/9 to 15/6; leather gaiter gloves, 5/6; long exhaust pipes, 10/6; sidecar shock absorbers, 7/6 set; Stewart speed indicators, 62/-; Glorphone horns, 18/6; sidecar hoods, 35/-; large P. and H. generators, 10/9; superior Holland jackets and leggings, 12/9 suit; spring forks, 42/6; frames, 84/-; handle-bar levers, 12 pattern; the Grado gear, 50/- to 80/-; Bowden band brakes, complete, 17/9; decompressors, 6/6; silencers, 4/-. The only city house for petrol tanks and pulleys made to order. Pillion seats, 7/6, rubber cushion handles, 3/- pair; rear lamps, 3/3. Accessories £4 or over supplied on gradual payments.—M.C. Dept., Metropolitan Machinists' Co., Ltd., 248, Bishopsgate, London. 'Phone: Central 12857. [6615]

#### BANCROFTIAN Co.'s Bargains.

TYRES. Clincher clearance.—26x2½, studded 16/9. heavy 23/6. 650x55, light car, 21/- and 23/6; 700x75 or 80, 25/-; 26x3, 21/-; 28x1½, 15/6; 26x2, 13/6; extra heavy, 18/6; 26x1½, 14/6; 26x2½, 21/-; wired heavy, 19/6, 2½ 21/-; Hutchinson and other makes, clearance large stock, at about half usual prices; Stelastic, 28x3 35/-. usual £2/19/6.

TUBES, Hutchinson clearance: 750 in stock; 26x2½ 5/3, 26x2¼ 4/6, 26x2 3/9, 24x2 and 2½ 3/11; Palmer, 650x65, butted 6/11, endless 6/6; 24x2, 5/6; Clincher, 650x65, heavy, 5/6; up to 10/- allowed for old covers if 1916 tyres are purchased, any make.

BELTING, all makes, up to 20% allowed for old belt; special line, ¾ rubber, 10½d. foot. Don't buy any tyres or belts until you see us; we can save you money.

WATERPROOF Clothing.—We are the cheapest in London, having pre-war contracts. Suits, double texture, guaranteed waterproof, 23/6, double breasted, as sold at £2/2. Very highest grade, treble texture suit, 39/6, as sold at £3/10. Seamless trousers, double texture, highest class, 14/6; leggings, 4/6, 7/6, 8/6; dust suits, 8/6 and 10/6.

BANCROFTIAN Co., 64, Bishopsgate, London. [2989]

1914 Douglas T.T. Frame; £2.—455, York Rd., Wandsworth. [7424]

SENSPRAY Lightweight Carburettor; offer.—L1,668, c/o The Motor Cycle. [7306]

MADON Clutch, as new, off Rex; 30/-.—Shaw, Red Lion, Abingdon, Wigan. [X2642]

JONES Trip, used, 35/-.—Stewart trip, new, 50/-.—64, Staines Rd., Hounslow. [X2668]

DOUGLAS Latest Handbook, with price list of spares, 1/-, post free.—Below.

DOUGLAS Spares, huge assortments, all and sundry, Robinson's Garage, Green St., Cambridge. [7493]

GRADO Gear, fit Triumph, new, unused; 45/-.—Clonette, 44, Kilmartin Av., Norbury. [7286]

TRIUMPH Spares, pre-war stock, large assortments.—Robinson's Garage, Green St., Cambridge. [7494]



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NO Spanners in the world have so fine a reputation for efficiency as the "KING DICK" SPANNERS. They are British made from solid steel drop forgings, and capable of infinite adjustment. Always grip and never burr the nuts. Made in four sizes—3in. to 9in. Remember that every "King Dick" is guaranteed for ever.

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## 'KING DICK' SPANNERS

## BUSINESS MOTORS

We have a large selection of machines suitable for all purposes. Supplied on the most favourable terms for Cash, Exchange, or Extended Payments

ENFIELD 6 h.p. Combination .....	85 gns.
ROVER 3½ h.p. 3-speed Combination ....	£87 10
B.S.A., 4½ h.p., 3-speed, chain and belt ..	£62 0
B.S.A., 4½ h.p., 3-speed, chain drive .....	£34 0
B.S.A. Sidecars. Model No. 1 .....	£16 0
INDIAN, 7-9 h.p., Powerplus, Model F ...	£83 0
INDIAN, 7-9 h.p., Powerplus, Model G ...	£75 0
CALTHORPE-J.A.P., 2½ h.p., 2-speed ....	36 gns.
CALTHORPE-J.A.P. 4 h.p. twin Combin'n	67 gns.
CALTHORPE, 2½ h.p., 2-speed, 2-stroke, lady's model .....	34 gns.
HOBERT, 2½ h.p. Villiers, 2-stroke, 2-speed	36 gns.
QUADRANT, 4½ h.p., 3-speed countershaft	£60 0
ENFIELD 6 h.p. 2-speed Combination ...	£89 5
ROVER, 3½ h.p., 3-speed countershaft ...	£66 10

Second-hand machines can be taken as part payment.

SOLE LONDON AGENTS FOR MONTGOMERY SIDECARS.

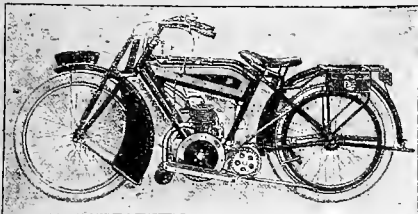
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was not built on L. S. D. spent in advertising claims that could not be sustained—But on actual deeds performed and quality and service given.

**Consider this!**



De Luxe Ivy Two-stroke Cycle.

Our Lists are waiting for your application, and are post free on request.

**S. A. NEWMAN, Ltd.,**

IVY MOTORS,

Lichfield Rd., BIRMINGHAM.

Telegrams: "Ivy, Birmingham."

### MISCELLANEOUS.

THE Motor Exchange, 24, The Parade, Tooting, S.W., has following for sale, deposit system:

**N**EARLY New Drop Back Frame, for 3½ h.p., Druid spring forks, luggage carrier, stand, tank, £4/10; 1914 Auto-wheel, £5/10; all-black P. and H. lamp set, £1; B. and B., for 3½ h.p., 10/-; Jones speedometer, done 1,922 miles, no trip, 30/-; plated generator, 6/6; 3½ h.p. 1909 Triumph engine, good order, £4/10; N.S.U. gear, fit engine with small boss, £3/10; one dozen magnetos, all types, in stock, send or call; Middlemore M.C. saddle, 7/6; 2-coil spring Empire de Luxe saddle, 7/6; pair Saxon spring forks, for 3½ h.p. or over, 35/-; Bosch magneto, off Triumph, £3/10; 26x2½ B.E. front wheel, 7/6; 26x2½ B.E. back wheel and belt rim, 12/6; new basket Continental 26x2½ cover, £1; nearly new B. and B., late type, 17/6; 26x2½ Stewart speedometer, 30/-; pillion seat, with dress guard, 15/-; Stewart speedometer, magnetic type, trip, good as new, £2; 3½ h.p. Brown engine, mechanical, as new, £4/10; nearly new Wood-Mine cover, steel-stud, 26x2½, £1; one ordinary, 15/6; sidcar chassis, 3-point, less wheel, 10/-.

**D**RIPPED Top Tube Frame, wheels, tyres, tubes, carrier; 50/-—F.L., 2a, Miat St., Lincoln. [7321]

**A**RMSTRONG Gears: any part return post.—County Engineering, 64, Staines Rd., Hounslow. [X2666]

**B**RAND New Hood, for Morgan; makers' price £5, accept 50/-—Gilpin, Motorist, Gildersome. [X2673]

**F**OR Sale, Senspray carburetter, 1914, 1in. Zilla belt, new.—Advertiser, Lanesborough, Longford, Ireland. [X2685]

**J**ONES Speedometer, 80 m.p.h., with trip, 2,000, as new; 50/-—Rinkside, Pearryho Rd., Kingston, S.W. [7438]

**C**OUNTERSHAFT Gear, 3½ h.p., 75/-; U.H. magneto, 55/-—Box L1,679, c/o The Motor Cycle. [7557]

**G**RADO Multi Pulley, suit lightweight, as new; price 30/-—J. E. Moore, Front St., Dipton, Co. Durham. [X2611]

**B**RAND New Blaks 3-jet Carburetter with spare jets; cost 54/-; what offers?—A. J. Chapman, Wadebridge. [7497]

**O**RTO Wind Screens, Atkinson's patent; 30/-—An ingenious sidcar wind screen, vide The Motor Cycle.

**H**OODS, wind screens, aprons, highest quality, lowest prices; price list gratis.—Atkinson's, 24, Armingher Rd., Shepherd's Bush, W. [7413]

**A**RMSTRONG Gears Repaired, or parts supplied promptly.—The Rotary Joining Co., Regent St., Warrington.

**R**OTARY Metallic Paste for all screwed joints, 1/3 per tin; Rotary sheet jointing for cylinder to crank case joints, 1/2 sheet.—Above. [5311]

**B**ASTONE'S.—New Simms mechanical horns, list 25/-, clearance price 15/-—228, Pentonville Rd., Kings Cross, London, N. [6226]

**I**RON Cement for cracked cylinders, water jackets, etc.; 1/2 tin, post free; stands heat.—Barker, Oxford Rd., Worthing. [X2639]

**A**RMSTRONG Mark VI., complete all controls, as new, in plated rim; £6/10.—Dobson, Stonefield, Garstang, Lancashire. [7509]

**G**RADO Multi Pulley, free engine, new 1916, 35/-; Zilla belt, little used, 7/6in. x 8ft., 12/6.—Williams, Somercotes, Derbyshire. [X2681]

**M**AXO Electric Horn, dynamo, head light, accumulator, 26x3 cover, decompressor.—Beardshaw, Auctioneer, Wood Green. [7323]

**1/9** Post Free, new acetylene tail lamp, fix number plate.—Palmer's Garage, Tooting. Approval against remittance. [7043]

**N**S.U. 2-speed Free Engine, off 1911 Triumph, perfect; 65/-, bargain.—E. Murray, 31, Manley St., Higher Broughton, Manchester. [7432]

**D**OUGLAS Amac Carburetter, cost £2/3/6, used two weeks, 32/6; new P. and H. generator, 7/6.—D. Milles, Oliver's Hydro, Buxton. [X2676]

**W**IND Screens, 6 patterns, for sidcars, 19/6, 27/6, 30/-, 32/6; sidcar hoods, 33/6.—Juno Showrooms, 248, Bishopsgate, London. [7466]

**C**LEARANCE Sale.—Motor frames, tanks, variable gears, plugs, covers, tubes, wheels, etc., new; lists.—W. A. Gorton, Wolverhampton. [7480]

**B**ONA-FIDE Agents send trade card for latest wholesale catalogue, cycle and motor cycle necessities; deliveries from stock.—Burslem, Oldham. [7479]

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**Q**UADRANT Frame, countershaft, tank, £5; pair 650x 65 Palmer cord covers, 25/-; 2-speed gear box, De Dion, 50/-—49, Woodfield Rd., Ealing. [7365]

**H**ANDLE-BARS, best quality steel, 10 gauge, stems 15 gauge, tops best plating, 12 patterns; 7/- each.—Juno Showrooms, 248, Bishopsgate, London. [7466]

**V**S. Pillion Seat, back rest complete, new condition, 20/-; Amac carburetter, off 1914 6hp Enfield, less controls, 10/-—Orton, 57, Muswell Rd., N. [7550]

**S**CREW-CUTTING Lathes (two), £15 each; hand saw, £12; 5hp Crossley gas engine, £15.—Call 9 to 9, Liquidator, 6c, Lansdowne Hill, West Norwood. [7377]

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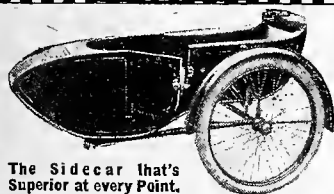
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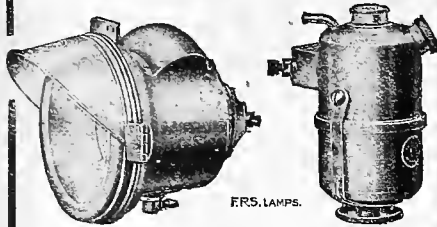
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[X2742]**VALVES**, high-class finish, 3% nickel steel, guaranteed, 3/6 each; piston rings, best quality, most popular makes, 1/6 each.—Juno Showrooms, 248, Bishopsgate, London. [7465]**OLSKINS**, motor suits, handle-bar muffs, rain coats, for everything waterproof, send for list.—The Para Rubber Co., Waterproof Garment Makers, 103, Bright St., Birmingham. [X2458]**MUST** be Cleared.—Covers, tubes, belts, variable gears, free engine hubs. Write for bargain list and free Human Puncture Outfit.—Le Paris, 166, Pentonville Rd., London, N. [7537]**1914** 6hp. J.A.P. Engine, unused, £14; complete cycle car chassis, with clutch, gear box, steering, etc., £12; the Joy 222.—C/O Manager, School of Mechanics, Eton College, Windsor. [7263]**NEW** Garner Whistles, 10/-; second-hand Cowey speedometer, £2/2; Tynesider Pillion seat, new, 18/6; Triumph adjustable pulley, soiled, 10/-.—Castle Motor Co., Ltd., Showroom, Kidderminster. [X2459]**NEW** 24in. x 2in. Beaded Cover and Tube 12/-, new 24in. x 2in. heavy cover 20/-, new 26in. x 2in. beaded cover 17/6, wired ditto 17/6.—Murray, 37a, Charles St., Hutton Garden, Holborn. [X2754]**31hp.** Engine, mag., carburetter, £4/10; Roc frame, 32 spring forks, 2-speed back wheel, 25/-; B.S.A. frame, back wheel, less tyres, 30/-; also wicker sidecar, £2.—63, Pardon Rd., Salford, Birmingham. [X2669]**BOLTS**, nuts, studs, screws, spindles, cotters, washers, etc., a useful assortment, 10cde, Whitworth, and metric threads, 5 gross assorted for 5/-; steel balls assorted, 1/4 to 1/4, 7d. gross.—Assets Auctions Co., Ltd., 129, Newington Causeway, London, S.E. [4870]**STEWART** Handyworker and Stoud, cost £3/10, £2/5; Lucas lamp set, 10/-; Armstrong T.T. 3-speed hub, suit Douglas, or 3 1/2, £5; Watford speedometer, trip, 35/-; Jones, incomplete, 17/6; Stewart, 30/-; Stewart trip, 1916, used 10 miles, 55/-.—64, Staines Rd., Hounslow. [X2797]**GASP** Wick Carburetter, complete, new, for 1 1/2 or 1 1/4 inlet, very economical, and increases power, especially suitable sidecar engines, cost 45/-, sell 30/-; Watford, done 2,000, 30/-; Lucas 60 horn, perfect, 12/6; approval against cash.—Coombe, Onfitter, Hols-worthy. [7411]**ROC**, 4hp., 2-speed, free engine, combination, perfect, £16; Triumph rear frame, wheel, stand, mudguard, new, 30/-; Senspray carburetter, 15/-; trip speedometer, new, 35/-; electric horn, 12/6; Stevens 4hp. engine, 25/-.—35, Derby Rd., Ponders End, Middlesex. [7442]**NEW** Clyno Parts.—3 valves, 3/- each; pair valve caps, 2/-; 4 gudgeon pins, 6d. each; 3 engine chain sprockets, 1/6 each; also Amac carburetter, new last October, 15/-; Stewart magnetic trip and mileage speedometer, less cable and gear wheel, 15/-.—Boyer, Holcroft St., Eddingshall, Wolverhampton. [X2749]**21hp.** Minerva Engine, 30/-; 2 1/2hp. Minerva cylinder, 10/-; four B.E. covers, 26x2, bargains, 5/- each; two new Sphinx plugs, for Ford cars, 3/- pair; lightweight Druid spring forks, 25/-; two pairs wheels, 26x2, 10/- pair; frame and forks, 7/6; spring fork attachment, 5/-; must sell; offers wanted.—F. Bookers, 90, Beeston Rd., Lincoln. [X2746]**ON** Munitions.—5 latest pattern frames, £2 each; 3 B.S.A. front wheels, plated, 26x24, new, 7/6 each; 1 pair 26x2 1/2, no spindles, 10/-; U.H. magneto, 50/-; ditto 45/-, no contact breaker, 35/-; J.A.P. 85 mm. cylinder, 12/6; Armstrong h.b. clutch control, new, 5/-; 7 1/2hp. Clincher 26x2 1/2 covers 18/6, steel-studded 28/6.—78, High St., Hampstead. Open 9 p.m. and Sundays.—One minute Tube. Phone: 5392. 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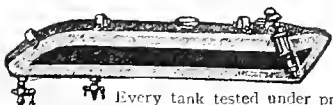
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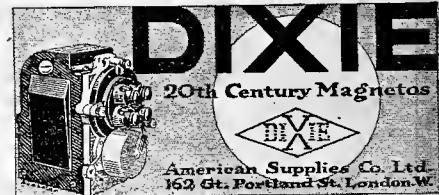
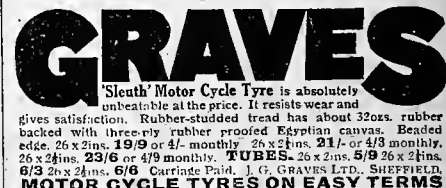
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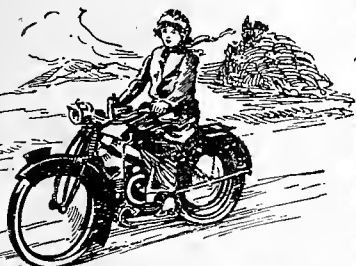
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**K**ERRY-ABINGDON 2-speed Gear, clutch, and kick starter, perfect condition, 23/10; Jones speedometer, 25/-; 26x2¼ Kempshall anti-skid, new, 25/-; Garner exhaust whistle, 5/6; Bradbury adjustable pulley, 5/6; 28x2 Palmer cord, 5/-; Enots drip feed, 9/-; new motor Footprint spanner, 2/6; large lamp bracket, 1/6; Bradbury carrier, 3/-; garage stand, 1/6; new Veeder cyclometer and trip, 7/6; new horn, 3/6; pair aluminium footrests, 2/6; brazing bellows and blowpipe, offers.—Wall, 104, Lansdowne Rd., Dalston, London. [X2607]

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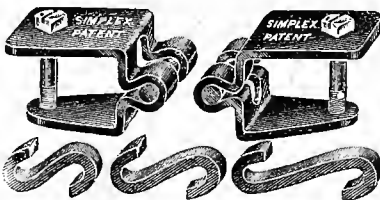
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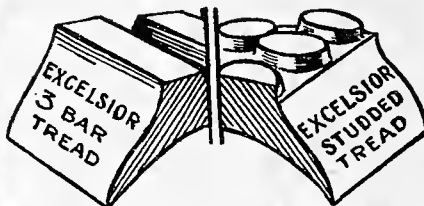
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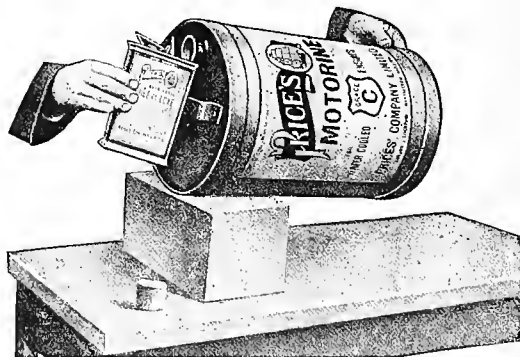
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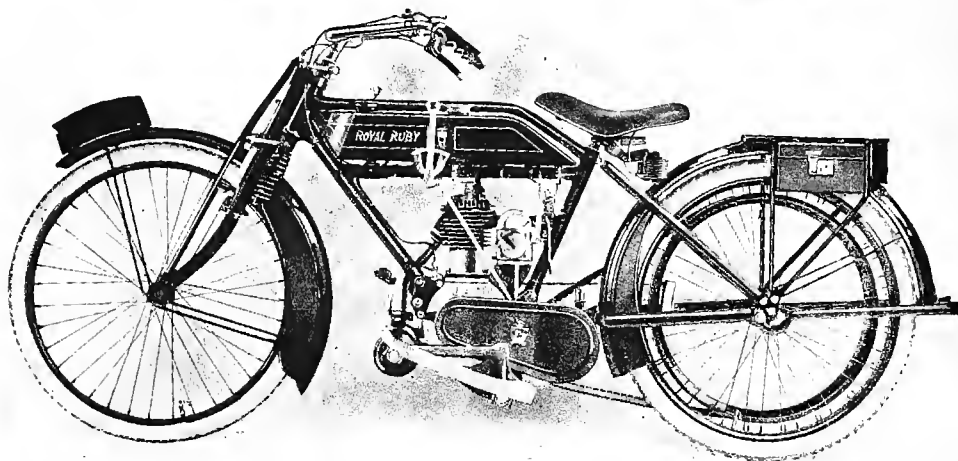
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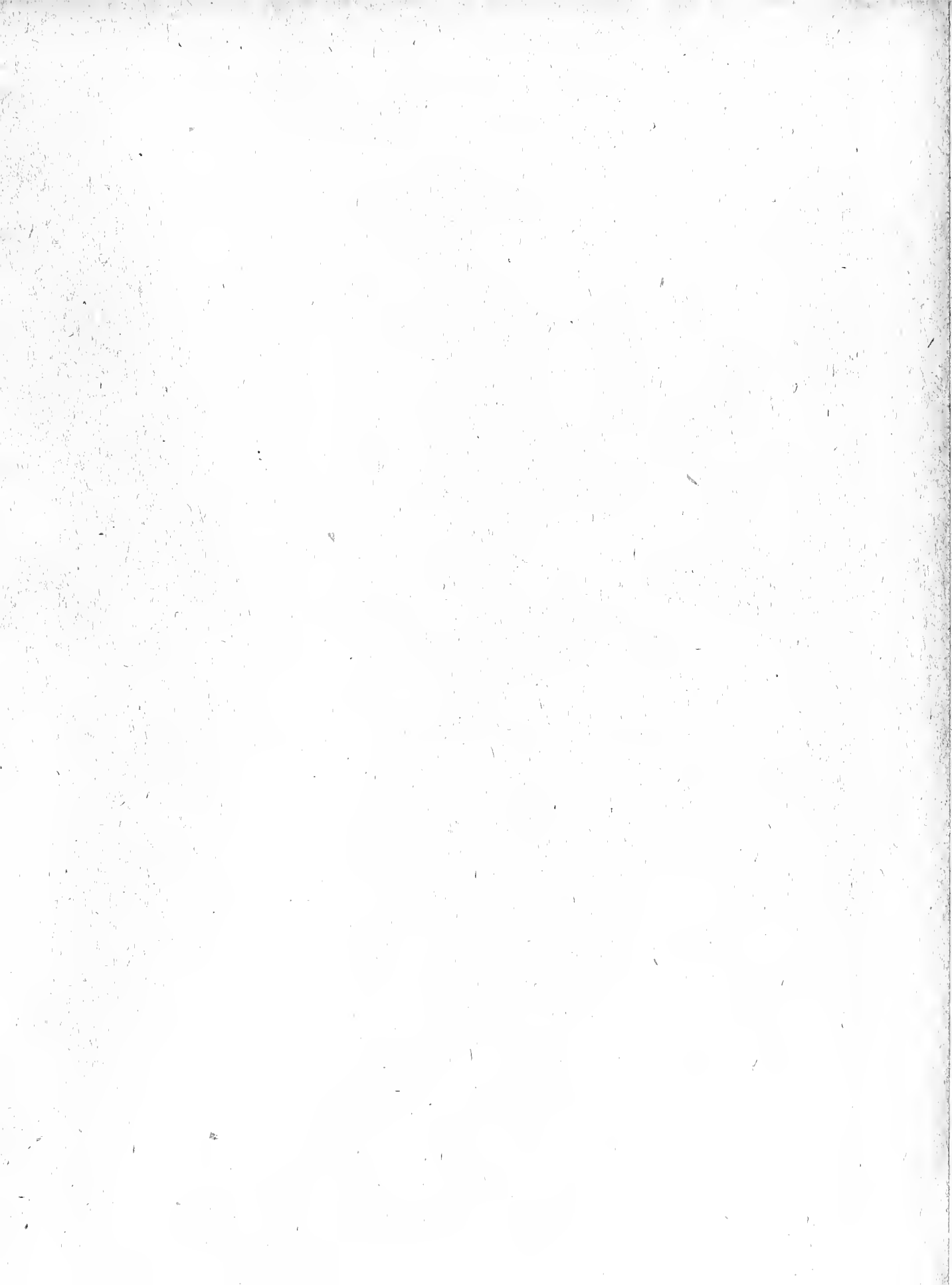
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